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VOL. VII—No. 5.

NEW YORK, AUGUST 1, 1889.

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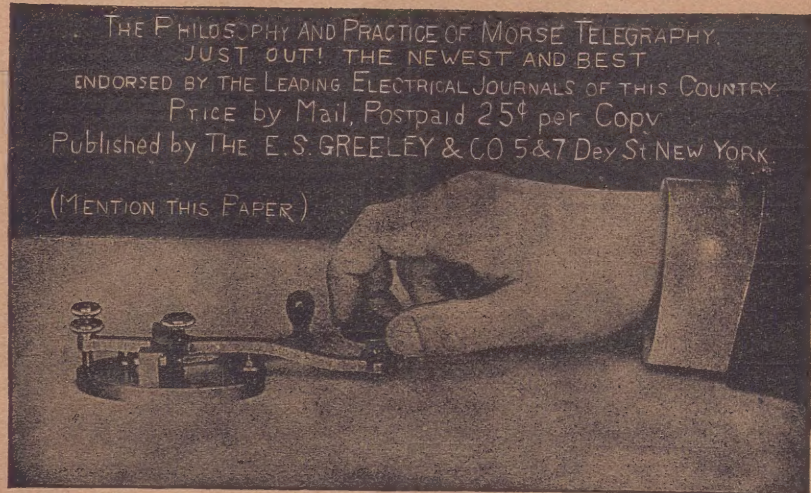
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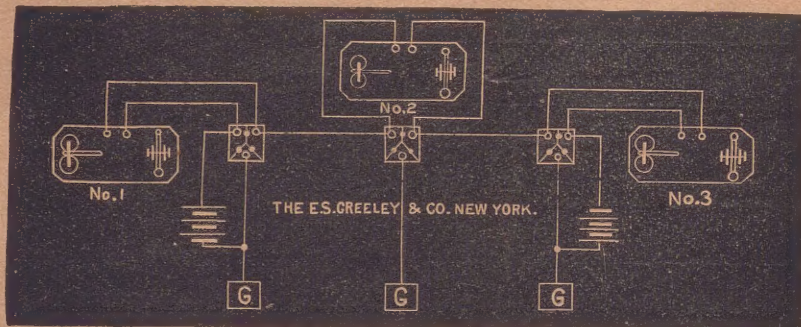
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The truth (referring to the true position of the telegrapher's hand in the act of "sending") exposed by a lightning wink of the instantaneous camera, and permanently fixed for our deliberate inspection by the science of photography, dawns upon the craft intellect accompanied with something of the amazement that startled the artistic world when the elaborate anatomical studies by Rosa Bonheur of the horse in the act of running were delivered over to universal ridicule by the subtleties of the same agent, instantaneous photography.—*The Electrical Review*, March 24, 1888.

The following diagram from the *Philosophy and Practice of Morse Telegraphy* gives an intimation of its scope.



**DIAGRAM No. 19.**

Diagram No. 19, showing three Home Instruments or other short line combination sets, connected up on a grounded circuit with Excelsior Lightning Arresters at three distinct offices. The Switch Pin in this case, while instruments are in use, must be kept in the "dead hole," which is the hole in the center of the middle plate.

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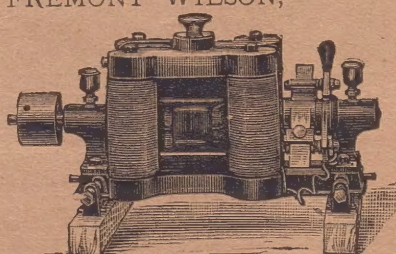
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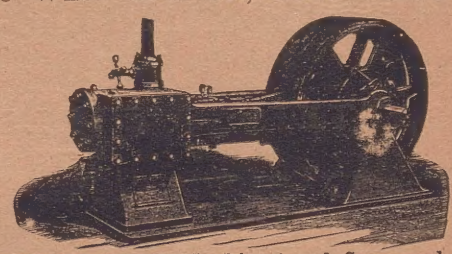
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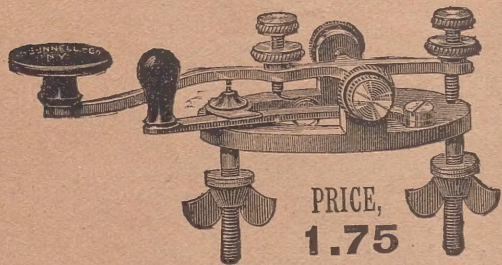
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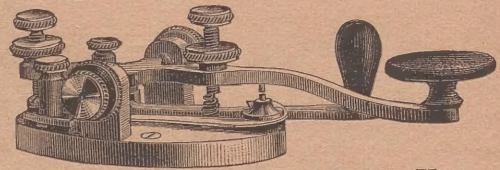


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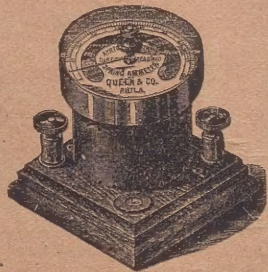
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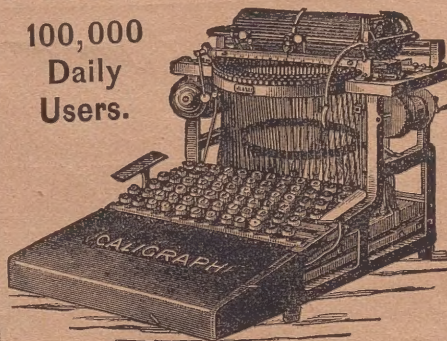


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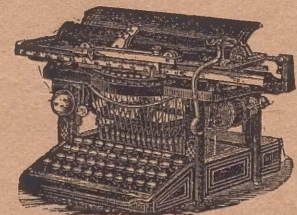
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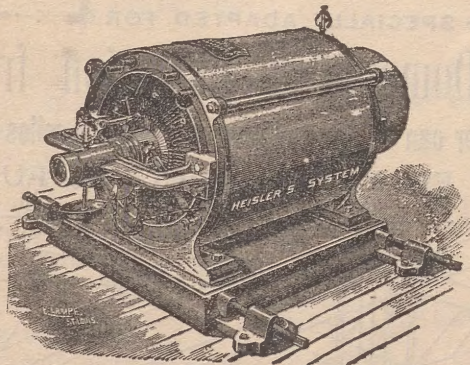
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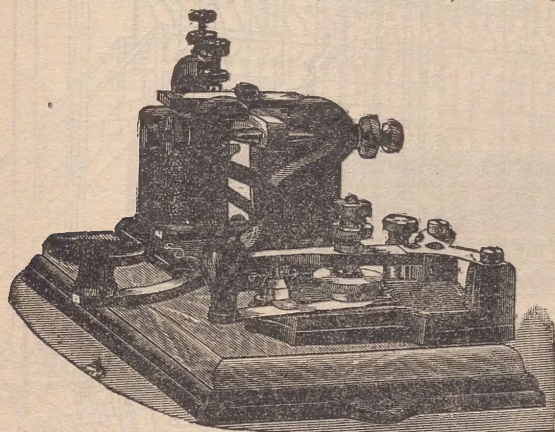


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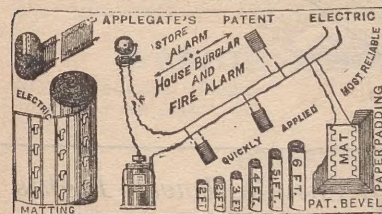
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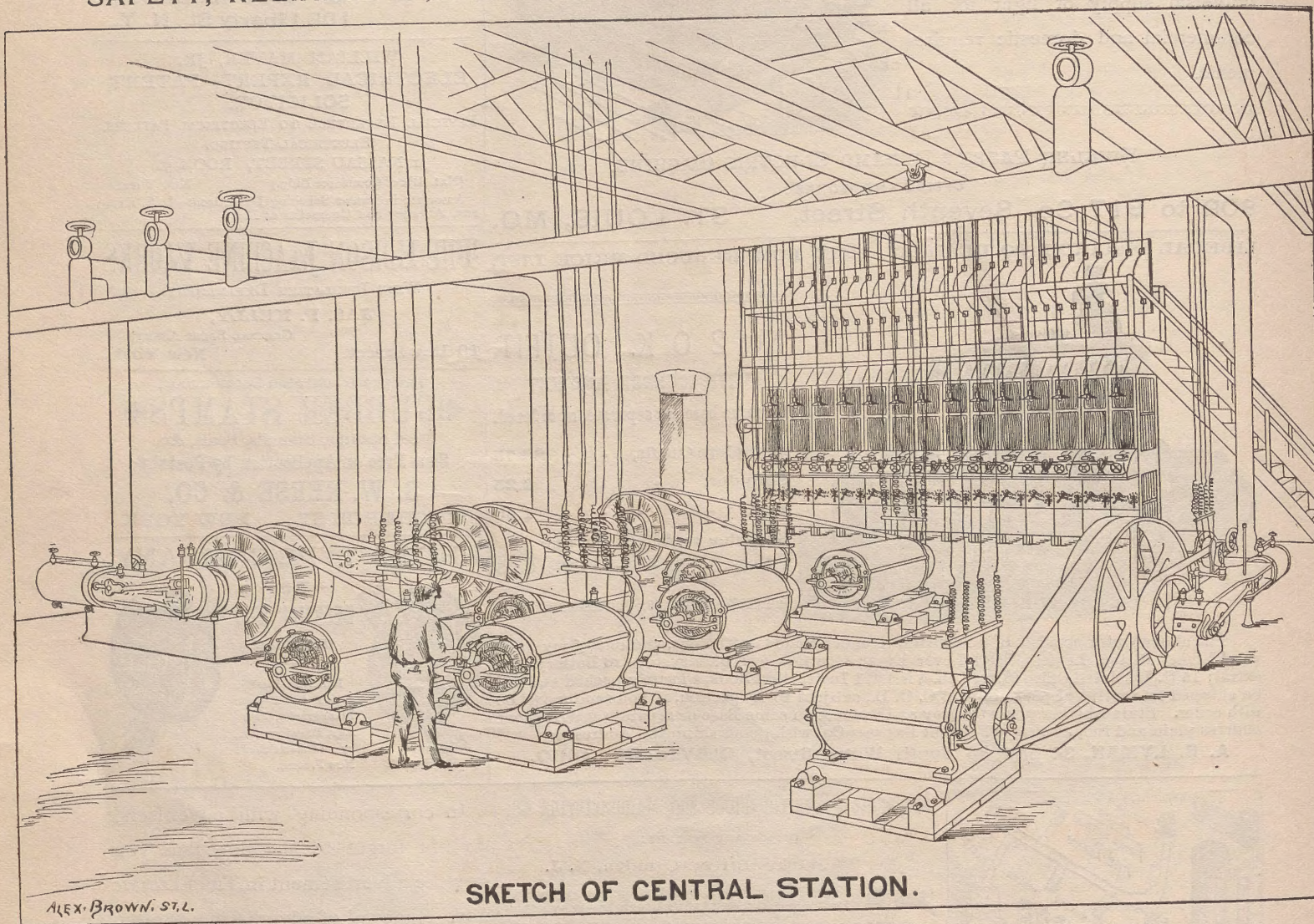
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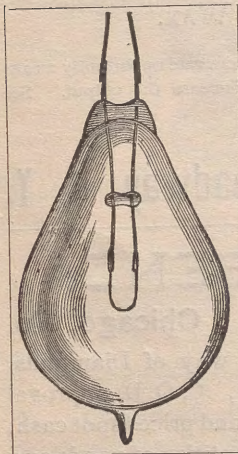
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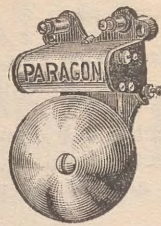
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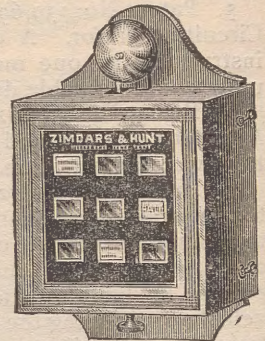
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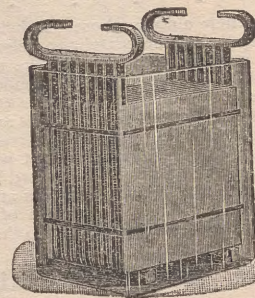
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# THE ELECTRIC AGE.

Published on the 1st and 16th of Every Month.  
BY THE ELECTRIC AGE PUBLISHING CO.

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NEW YORK, AUGUST 1, 1889.

Another new cable from England to America is proposed. It is to run from the west coast of Ireland to the Straits of Belle Isle and be an independent cable for Canadian purposes.

Both the incandescent and arc systems of lighting by electricity are being tried abroad. Thus far neither has shown a sufficient improvement over the other to have it generally adopted.

Recently in England they had some tests with the electric search light to try and discover which colored uniforms were most easily seen. Red was the most conspicuous, blue the least.

One of the novelties to be seen at the Paris exposition is a drop-a-coin-in-the-slot machine which takes photographs "while you wait." It is operated by electricity and is said to do good work.

In the express trains in England that are lighted by electricity the dynamo is in the guard's van and it is driven by the wheels of that vehicle. An accumulator supplies the current when the train is not in motion.

The recent increase of capital granted to the American Bell Telephone Company was asked for to provide for the construction of a magnificent system of metallic circuits connecting all the large cities of the country.

An electric railway is to be constructed at Pullman, Ill., upon which to exhibit the various systems of electric propulsion. Mr. Pullman intends that all systems now in successful use may be seen in operation there.

The French accumulator of the Commelin-Desmazures type has proved itself well adapted for working search lights. One advantage is that a remarkably powerful current can be taken from it with comparative safety.

Mr. Edison has given notice that he will contest the decision of the Canadian Commissioner of Patents, who canceled Edison's patent for incandescent electric lighting in Canada, on the ground that the article in question was not manufactured in the Dominion within two years after the issue of the patent. Mr. Edison's plea is that the Commissioner had no authority to hear the application,

A new engine-room telegraph for steamships is so arranged that should the engineer misunderstand the order signalled by the officer on the bridge or fail to obey the order promptly, an alarm bell is set ringing and continues to ring until the error is corrected.

The whole apparatus of the new electro-pneumatic signal balloon, including the machine for making the gas, weighs only fifty-two pounds and can be conveniently carried by one man. The balloon is held captive by two wires connected with two electro-magnets acting on a cylinder of compressed air which works a set of signal arms.

It was reported that Postmaster-General Wanamaker had succeeded in euchreing the Western Union Telegraph Company out of the profits they have been making on the Government messages sent over their wires. Under an act of Congress passed in 1866, the Postmaster-General has the power to arbitrarily fix the rate to be paid for telegraph service done for the Government. From that time to the present the rate fixed each year has been one cent a word, no despatch to be less than 20 cents, and an allowance of 10 per cent. for messages sent over one thousand miles. Now, however, it is said Mr. Wanamaker has curtailed the golden harvest. When the contract was renewed last month he, the story goes, reduced the rate to one mill a word, thereby spreading consternation among the Western Union officials, who claim that at such a rate the business would entail an actual loss.

The use of animals for the propulsion of street cars, says the *Sun*, notoriously involves the greatest possible expense in producing a given amount of work. It takes considerable money to buy them in the first place, they are liable to numerous diseases and to sudden death, the feeding and care of them requires the services of large numbers of men, and, altogether, they are very troublesome and unsatisfactory. Machinery, on the other hand, whether for cable traction or for electricity, while it may be more costly at the outset, is less expensive to maintain, and it never gets sick nor dies. Coal is cheaper than hay and oats or any other kind of provender; steam engines and boilers do not need a small army of stablemen and grooms to wait upon them, and the repairs and renewals of iron work bear no proportion to those which must be made to keep bones and muscles in good order.

**PROPOSED SUBMARINE CABLE.**—The Chilian Government, considering it indispensable that telegraphic communication should be established between Punta-Arenas (Sandy Point) and the centre of the Republic, in order to facilitate the navigation of the Straits of Magellan and the south coast, as well as to assist in the development of the new towns of Palena and Munoz-Gamero, ask for tenders for laying a cable to connect Melipulli and Punta Arenas, and touching at Quincavi, Palena, Melinka Port Otway and Munoz-Gamero. London, Eng., firms are asked to forward bids.

**THE FRENCH CABLE.**—It was reported that the management and operation of the French cable from Sidney to St. Pierre, and thence to France, had been taken by the Mackay-Bennett Company. Vice-President Hector de Castro, of the Commercial Cable Company, said that there was no truth in the report and that General Manager Ward's visit to Nova Scotia had nothing to do with the matter. The French Cable Company, he said, has landed a cable section between St. Pierre and Canso in order to connect with the telegraph of the Canadian Pacific Railway Company, which is now building land lines in Nova Scotia. This gives the French cable a second connection between St. Pierre and the United States, viz., St. Pierre and Cape Cod.

## THOMAS ALVA EDISON.

Thomas Alva Edison was born on the 11th of February, 1847, at Milan, Erie Co., Ohio.

His history is well known and is household property. Suffice to say he is the foremost inventor and electrician of the age.

The inventions of Mr. Edison, which have had the greatest value, have been the gold and stock quotation printer, the duplex and the quadruplex telegraph, the carbon speaking telephone, the Edison dynamo, the incandescent lamp, apparatus for the separation of metals, phonograph, and numerous others.

Mr. Edison has received more patents than any hundred other inventors combined. Thirty patents pertain to automatic and chemical telegraphs, thirty-eight to printing telegraph instruments, fourteen to Morse's telegraph proper, with a considerable number relating to fire alarms, electrical signals, district and domestic telegraphy, the electric pen, tasimeter, microphone, aërophone, the electric light and hundreds of other electrical and mechanical apparatus.

He is probably the hardest worker in the United States, and appears to have a natural taste for difficult problems.

More of his inventions are now in use, and more of those in use pay a profit, and the aggregate of the profits on his inventions is probably larger than those of any other inventor in the world. His income from royalties alone is over \$100,000.

#### EXPERT ELECTRICAL TESTIMONY IN THE KEMMLER CASE.

In the reference case of Kemmler, who was sentenced to be killed by electricity, a good deal of interesting testimony has been taken. The first witness examined before Referee Becker was Harold P. Brown, who had sold the State the dynamos and other apparatus to be used in killing, or attempting to kill, criminals sentenced to death.

Mr. Brown testified that if the electrode is properly moistened, and the supply of fluid is abundant, there is no danger of burning, for the fluid used in moistening cannot heat above boiling point.

"What is the intensity of the force required to kill a man of the average resistance when the charge is applied to his head?"

"Beyond any doubt the pressure of 1,000 to 2,000 volts, with the electrodes of the proper sizes, would be fatal with the current passing from head to foot."

Even with a man with a resistance of 50,000 ohms, Mr. Brown would not vary his opinion if the surface of the electrodes was kept wet. Death would ensue, he calculated, in less than 15 seconds, and in this time the electrodes would not become appreciably heated. He doubted whether salt water, if used to moisten the electrode, could ever reach the boiling point on account of the rapid radiation of the heat.



THOMAS ALVA EDISON.

Mr. Franklin L. Pope, the well-known electrical engineer, testified. Mr. Cockran then put a series of questions with the object of showing that according to Mr. Pope and other experts there does not now exist and probably there won't be devised any means of measuring accurately the resistance of the human body to electricity, that the death of a man by electricity depends upon several contributing causes, and that the machine to be put up in Auburn prison won't be capable of doing what Mr. Brown claims for it.

Mr. Cockran began by inquiring if a Wheatstone bridge could register the resistance of a living organism. Mr. Pope said he thought it was not fully capable of doing that, though it could measure the resistance of metals with almost absolute accuracy. He made the test at the Western Union office with the assistance of G. W. Gardanier, a Western Union electrician. He took hold of two electrodes, having previously wet his hands with sulphate of zinc. The current was turned on, and the resistance of his body through the chest and arms was measured. The

measurements were taken with different electro-motive forces. One volt gave 6,300 ohms resistance; 10 volts gave 5,140 ohms, 50 volts, 3,850 ohms, and 100 volts gave 3,500 ohms, showing that the apparent resistance as determined by the Wheatstone bridge varied according to the currents.

Q.—Suppose you had been wire, would it have made any difference? A.—It would have given the same result with 100 volts as with one volt.

Q.—Can you account for the failure of the Wheatstone bridge to record when a living organism is used, and different voltages are used? A.—I conjecture that it is due to the chemical actions upon the fluids of the body.

Q.—Is there any means to measure accurately the resistance of a living organism? A.—I think there are no means to determine it as we can with an inorganic substance. If we were to

send a man to be measured by half a dozen electricians the results would all vary. The man would measure differently, too, according to his physical condition.

Q.—Can electrical science measure the resistance of a living organism? A.—Well, you would get a result each time, but you can't tell whether it would be accurate.

Q.—How much can you tell about the probability of killing human beings from experiments made in killing inferior animals? A.—I think very little.

Mr. Post—Do you say that the dynamo for the State to be used at Auburn prison can't be run with a voltage of 2,000 volts with safety? A.—Yes, sir; I say so. If you are going to run it at 2,000 volts you would have to run it at twice the speed it was built for, and this would be unsafe.

Mr. Cockran wound up his catechism of the witness with the interrogatory: "Could you, as an expert, describe a current which in every case and with every person would absolutely cause death?"

Mr. Pope answered; "No; I could not."

F. W. Jones, assistant general manager of the Postal Telegraph Company, was examined by Mr. Poste. The witness said the fact that, as shown in his experiments in electric measurement of human bodies, an increase of electro-motive force is always followed by a decrease in the resistance of the subject was due to the fact that the body was a poor conductor, and similar results were obtained with all poor conductors, such as moistened glass, damp branches of trees, &c., that come in contact with telegraph lines. The human body, he said, was similar to a sponge, which was a non-conductor unless saturated, and the conducting elements of the human body are the fluids, as bone, dry muscle, &c., are non-conductors. In his subjects he found no definite resistance, as each subject was found to give their different measurements with different electro-motive force. In his opinion the dog Dash must have received a large portion of the current in the wire with which he came in contact or he would not have been so badly hurt.

In answer to questions by the referee, the witness said he had doubts about the practicability of using two dynamos to produce a combined current in case one proved inadequate. He thought a dynamo could be made that would generate 2,000 or more volts, but to increase the velocity of a dynamo beyond its given capacity would invite a breakdown and would be liable to incapacitate the machine.

Thos. A. Edison, the well-known inventor, said he had been an electrician twenty-six years, and in reply to questions he said he was familiar with the various dynamos and their construction and that they all generated either a continuous or an alternating current.

"A continuous current," he said, "is one that flows like water through a pipe. An alternating current is the same as if the same body of water was allowed to flow through the pipe in one direction for a given time and then its direction reversed for a given time."

The witness said he had been present when measurements were made in his laboratory to determine the resistance of human beings. Two hundred and fifty persons were measured, and their average resistance was 1,000 ohms, the highest being 1,800 ohms and the lowest 660.

"Will you describe the method of the application of your tests?" Mr. Poste asked.

"We took two battery jars about seven inches in diameter and ten inches high and put in each jar a plate of copper. In the jar we put water with a 10 per cent. solution of caustic potash. The parties we measured plunged their hands into the liquid so that the ends of their fingers touched the bottom of the jars. After waiting thirty seconds the measurement was taken. No one could go above eight volts."

"Where, in your opinion, is the major part of the resistance located?" Mr. Poste asked.

"I should say 15 per cent. at the point of contact. The balance in the body."

"What is the law that governs the passage of an electric current, when several paths of varying resistance are offered to it?"

"It divides in proportion to the resistance encountered."

"Please explain the burning effects sometimes produced in the case of contact with an electric wire."

"It is due to bad contact, and the difference in resistance between the wire and the flesh."

The witness denied that Harold P. Brown was in any way connected with him or any of his companies.

"In your judgment can an artificial electric current be generated and applied in such a manner as to produce death in human beings in every case?"

"Yes."

"Instantly?"

"Yes." He advised placing the culprit's hands in a jar of water diluted with caustic potash and connecting the

electrodes therewith, and he said 1,000 volts of alternating current would surely produce painless death instantaneously. He did not think so small a continuous current would, although by mechanically intermitting the continuous current it could be made very deadly.

Mr. Cockran in his cross-examination laid much stress upon Mr. Edison's views as to the resistance of human beings.

"Did you make the experiments on men which you have mentioned with a view to ascertaining just how to measure the resistance of Kemmler and find out how men may differ in the matter of resistance?" asked Mr. Cockran.

"I did. I made the experiments day before yesterday," Mr. Edison replied.

"And you found out there were different degrees of resistance in different men?"

"Yes; but that does not mean that the same current would not kill all the men."

"What would be the effect of the current on Kemmler in case the current was applied for five or six minutes? Would he not be carbonized?"

"No, he could be mummyized. All the water in his body would evaporate in five or six minutes."

With what he had found to be the average resistance of the human body, the witness said that 1,000 volts would give a man an ampere of current which is ten times as much as any man needs to kill him. The witness denied that he ever gave Harold P. Brown a letter of recommendation. Mr. Brown applied to him for permission to make some experiments and he granted it, and that was all the relations existing between them. In reply to a question by the referee he said there was an alternating dynamo in London that generated a 10,000 volt current, and he considered it safe to double up dynamos to increase the current for use in executions.

"This is your belief, not from knowledge?" Mr. Cockran asked.

"From belief. I never killed anybody," the witness quietly replied.

Arthur E. Kennelly, one of Mr. Edison's electricians, was the next witness. He testified that he conducted the measurements in resistance of which Mr. Edison had spoken.

On cross-examination by Mr. Cockran the witness said the amount of current that could be sent through a human body was purely experimental, not having been proven. He believed a man could be killed without burning the body, but acknowledged that the belief was based solely on their success in killing dogs. He had never heard of a man being killed by electricity who was not burned.

"What would be the effect of a dynamo current that did not kill if applied for a long time?" Mr. Cockran asked.

"How can I say without seeing it done?" the witness inquired.

"That's just what we have got back to. That's all," the attorney responded.

**THE EDISON CONVENTION.**—The Edison convention will be held at Niagara Falls on August 13 and 14, and will be well attended by representatives from all sections of the country.

**ELECTRIC LIGHTING IN CHINA.**—Chinese journals state that electric lighting is rapidly extending in such towns as Peking, Hong-Kong, Shanghai and Canton.

The Clark Electric Co. have just moved their offices from 159 Chambers st. to their new and beautiful offices in the Corbin Building, 192 Broadway, cor. John st., New York. The location is right in the neighborhood of all electric lighting companies. The building being new and built by the well known Austin Corbin, the Clark Co. have selected wisely for their purpose, which is arc lighting.

## CHARLES HEISLER.

PRESIDENT OF THE HEISLER ELECTRIC LIGHT CO.

To make one's mark in this age of invention requires born genius indeed. To claim attention in the electrical world one must possess tested abilities. Electrical science has become within the last few years the foremost science. Others have their functions and merits, but electricity is the prevailing and all pervading branch of human knowledge. Others have a particular sphere and their usefulness for the well being of the human family, while electricity is unconfined and has the world at its feet, it can be said, without contradiction. As a science it is an infant as yet, for its capabilities and usefulness were not known until quite recently. Its strides have been both enormous and wonderful. Its development almost instantaneous. Those who have made a study of it within the past decade or so have learned much, and those who, with a brain for its intricacies, have experimented, have made discoveries at which the world stands aghast.

Electricity so applied as to be the means of affording light has been a fruitful field to the patient investigator and the results have simply been marvelous. The electric light of twenty years ago was a costly curiosity at best, but since then has been brought into universal use at almost mere nominal cost by these toiling brains.

The difficulties that had to be overcome in order to produce an abundant electric fluid, and the management of the erratic current when so produced, required great forethought as well as much experimenting. That this was finally brought about is now a well attested fact. Among the few who have produced grand results in this line stands one of St. Louis' well known citizens, Mr. Charles Heisler. Success crowned his efforts and to-day the Heisler Long Distance Incandescent System is the only system that can transport electricity any distance at a mere nominal cost.

The desideratum he has obtained is, namely, a development of electricity truly extraordinary, which can be conveyed any distance—a current harmless to human beings, for lamps of great brilliancy. Mr. Heisler was always a leader and never an imitator, and many of the well known discoveries, he was the first to solve them and apply them to his inventions.

Mr. Heisler started manufacturing early in the eighties, and for some time past his mammoth works have not been large enough to meet the demand for complete plants. The call is from not one section but from all parts of the United States.

The St. Louis Illuminating Co., which furnishes incandescent lights to subscribers and uses the Heisler system altogether, never had an accident and never had an employe or patron shocked. It can be said that the Heisler system has reached the acme of perfection in

electric lighting, as regards cheapness, durability and safety. The directors of the St. Louis Exposition have used electric lights from the start, and after many trials of the different systems have taken the Heisler. The art gallery of the Exposition, which contains thousands upon thousands of the best works of art of the old and new world, is lighted by the Heisler system, and that, too, after experimenting with other systems. From Maine to California and from New York to Florida can be found plants run by the Heisler system. Most of these plants were put up after full investigation of the different systems by the engineers and directors of these companies.

The Heisler Electric Light Co. know they have a good thing and court investigation and comparison with other makes.

Charles Heisler, the inventor and patentee, of whom we give an excellent portrait on this page, is an adept in the electric light manufacture. It has been his whole life's study. He has devoted his early years to electricity. He is an accomplished electrician, an expert mathematician, a born inventor, a

hard and painstaking worker, and lastly a gentleman. Although sprung from German parentage, still he is a thorough American in every respect. With tact and discretion, a prolific brain, deft and experienced fingers, and above all, a man of great business qualifications which men of genius too often are sadly deficient in. He not only experimented and brought out great machines, but organized and successfully launched companies with large cash capital to manufacture and sell his inventions, which have now become famous.

To-day the Heisler Electric Light Co. has as much financial standing as any in the land. Thrift, genius and business tact produced this happy state of affairs. Go where we may, we hear of the Heisler.

All his machines are covered by letters patent, but also in Canada, Mexico, England, France, Germany, Russia and all the civilized

countries of the world.

Mr. Heisler is in the prime of manhood, is well developed physically with a strong constitution. His features denote a jovial good natured man, which he is. All who have transacted business with him agree that it is a pleasure to meet a man with such a sunny disposition.

Mr. Heisler is a popular citizen and besides giving employment to an army of men, has done his share to advertise St. Louis as a great manufacturing center. As a manufacturer especially is the city proud of him.

In one respect the Paris Exhibition excels all others, for there has never been collected together so fine a display of electrical mechanism of every conceivable kind. There is at present an unparalleled impulse in Europe towards electrical engineering and the desire to extend the use of electricity to all branches of manufactures.



CHARLES HEISLER.

## NEW PUBLICATIONS.

Incandescent Wiring Hand Book; F. B. Badt; Electrician Publishing Co., Chicago, Ills. This excellent little book, which is similar to Dynamo Tender's Hand Book and Bell Hanger's Hand Book, by the same author, is replete with information pertaining to practical methods of incandescent wiring. It contains 35 illustrations and five tables. From the preface we gather that it has been the author's object to prepare a hand-book containing practical suggestions for workmen, and tables of exact data from which sizes of wires, distances and percentages of loss in conductors could readily be computed by those unfamiliar with algebraic formulæ. The book is well worth possessing and we predict for it as hearty a reception as attended Mr. Badt's previous efforts in the books above mentioned. The price is \$1.00.

AMERICAN OZOKERITE.—The company producing this material needs only a very moderate amount of additional capital to carry forward their production to a dividend paying quantity. Manufacturing electricians should all be interested. Profits are large over producing cost, and the deposits are inexhaustible. The subject has been largely treated of in former issues of this paper and also in the *Engineering and Mining Journal* and the press generally. A few moments given to investigating this matter will convince any one that a most profitable enterprise is wanting capital only.

C. McIntire & Co., manufacturers of patent electric connectors for electric light, telephone and telegraph wires, of Newark, N. J., has received the John Scott Medal from the Franklin Institute of Philadelphia for the high character of their goods. This enterprising firm has also just filled a large order for the International Bell Telephone Co., Limited, of New York, at Antwerp, Belgium, for connectors for hard drawn copper wire.

## TRANS-ATLANTIC CABLE ROUTES.

## COGENT REMARKS IN FAVOR OF A CANADIAN CABLE.

Mr. F. N. Gisbourne, in an excellent illustrated article on the above subject, in the present issue of *Dominion Illustrated*, of Montreal, gives the lengths in miles of the various Atlantic cables and shows that the proposed Canadian Atlantic cable will be 1900 miles from Ireland to the Straits of Belle Isle, Canada.

He says: "It is estimated that the *profitably* serviceable continuity of the cables will be twenty years' for the older and twenty-five for the later types; last year's costly experience in repairing the Anglo-American French cable of 1869 is confirmatory of the former calculation.

"Thus the three additional cables of the Anglo-American Co. have a prospective existence of four, five and eleven years, respectively, and it is evident that the hitherto controlling power of the Company *re* tariff and pooling dictation is an evil of the past.

"The Direct United States Cable has yet a prospective profitable career of five years; the Compagnie Française ten years; thus the Western Union and Commercial Companies, with their later cables of longer life, have control of the situation, as exemplified by the present established tariff rate of 25 cents per word."

The Belle Isle route will be over 150 miles northward of any trans-Atlantic cable now laid, and the depth of ocean will be considerably less; it will thus be absolutely free from all risks during the repairs of other cables and can be more readily raised when required.

The capital expenditure of the Company will not exceed \$1,600,000, one of the principal Cable Manufacturing Co's. in London having tendered to provide, lay and guarantee a cable of the most approved type for the sum

of \$1,500,000. Thus the Company's line will cost less than  $\frac{1}{5}$  of each Anglo-American Cable,  $\frac{1}{4}$  that of the Direct United States, Compagnie Française and Western Union lines and a little over  $\frac{1}{3}$  that of the Commercial Co's connections.

The present number of trans-Atlantic despatches relating to Canadian business alone average 800 per day and are rapidly increasing; and should the proposed Japanese, China and Australian trans-Pacific cables be laid, the business will be almost infinitely added to.

Mr. Gisbourne concluded his article as follows: "No further argument is required to prove that the Canada Atlantic Company can *command* their own fair share of business; as they can well afford to reduce the total rate per word, or to increase the proportion per word that is allowed to connecting land lines by the existing cable companies."

## H. WARD LEONARD.

The appointment of H. Ward Leonard, of the Leonard & Izard Company, Chicago, to the position of general manager



H. WARD LEONARD.

of the United Edison Manufacturing Company of New York, is highly complimentary to Mr. Leonard, especially in view of the fact that he is now only 27 years of age. The appointment goes to show the opportunities for young men in the electrical world. He is recognized as an able electrical engineer, and he possesses executive ability in a marked degree. Mr. Leonard has a host of friends in Chicago, a number of whom joined in giving him a complimentary dinner on the eve of his departure for New York.

We are indebted to the *Western Electrician*, of Chicago, for this excellent engraving of Mr. Leonard.

Anyone desiring to purchase electrical patents such as advertised in this issue by H. D. Rogers, of 75 Maiden Lane, New York, will find them worthy of examination. They possess merits which will attract the attention of electric light companies, and storage battery concerns.

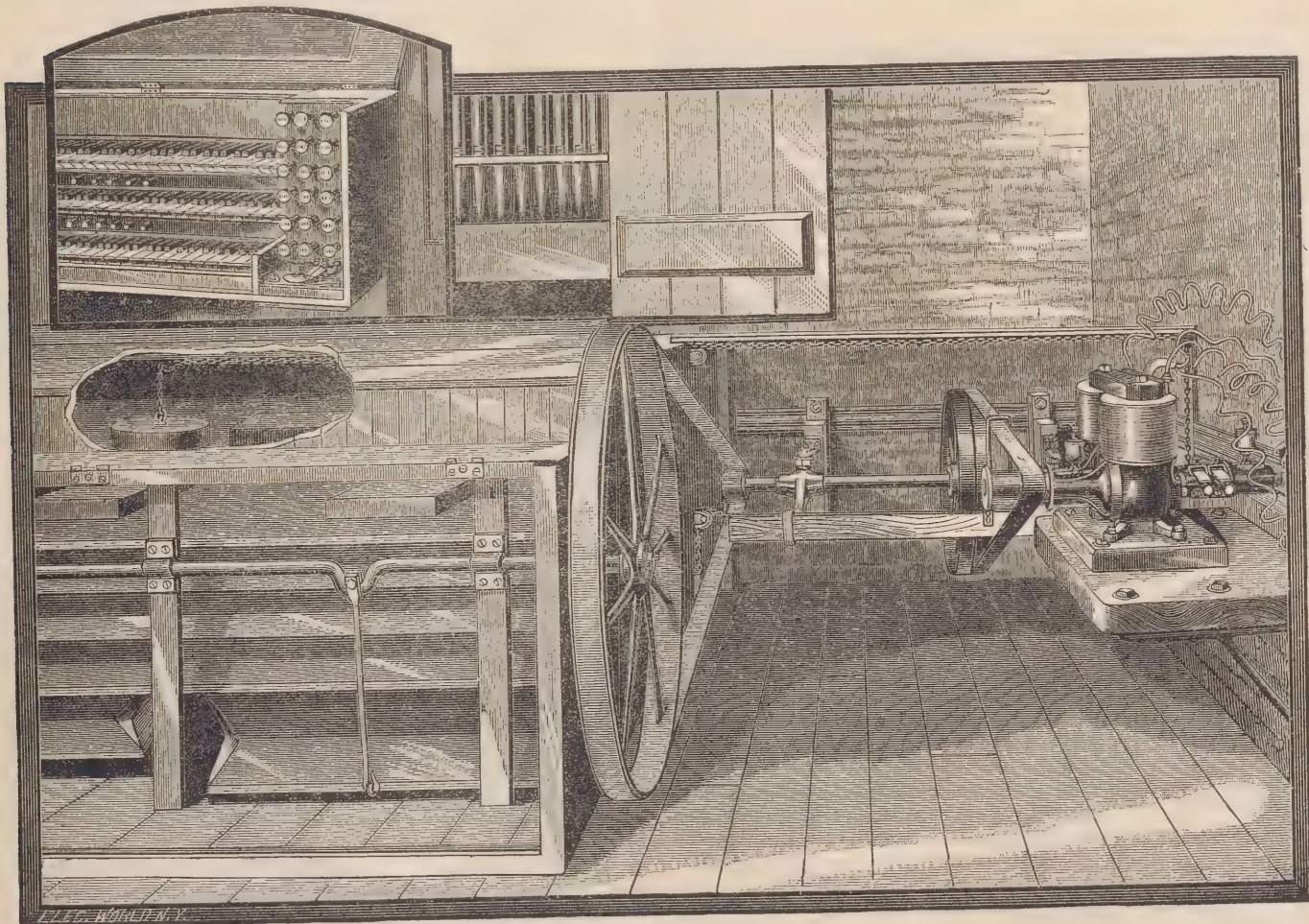
## THE ELECTRIC MOTOR IN CHURCHES.

The use of the electric motor for power in blowing organs is no longer a question of experiment but has already been proved practically successful. The small space that it occupies, the evenness of its blowing, the facility of its control in starting and stopping as well as in regulating, and the little attention required, are the special advantages that the electric motor possesses over any other power used for this purpose. It runs practically noiselessly, is free from heat or odor, gives no trouble from frost in the coldest weather, and may always be considered thoroughly reliable.

If an organ is built for power, its attachment is the work of a moment. If built to be pumped by hand it can

As the bellows rise the speed of the motor is reduced until they are full; at that point the motor is at rest and starts as the bellows again fall.

Partrick & Carter, electrical supplies, at No. 14 South Second street, Philadelphia, have issued a new and exhaustive catalogue of their goods. As all their newest ideas in electrical supplies and novelties will be illustrated and fully described, no user of electrical goods, nor, indeed, any person who desires to keep himself informed on the progress of electrical appliances, can afford to be without one. If the reader of this is a dealer and wants discount sheets, he should send his business card, and the request will be granted as quickly as possible.



C. AND C. ELECTRIC MOTOR AND ORGAN ATTACHMENT IN ST. PAUL'S CHURCH, NEW YORK.

easily be transformed into one ready for power, although this should be done with great care. Regulation may be effected by varying the speed of the motor by the movement of the bellows, or by using a constant speed motor employing a mechanical movement to connect or disconnect the power by shifting a belt which is acted upon by the rise or fall of the bellows. In our cut the C. & C. motor in St. Paul's Church, which we illustrate, is automatic and connected to the main driving pulley by a shifting belt. When the bellows rise to a certain point this belt is made to work on a loose pulley, thus disconnecting the motor from the driving shaft. When, however, the bellows fall below this point (by the use of the compressed air), the belt is made to automatically shift on to the tight pulley and the motor again does its work.

The phonograph has been employed in diplomatic correspondence. The Italian Charge d'Affaires in London sent a letter to Signor Crispi upon a phonograph cylinder as being the safest means of communication.

The new war vessel Puritan is to be provided with electric lights, not only for side lights, masthead lights, and search lights, but also for internal illumination throughout.

Thomas A. Edison sails for Europe on August 3, and will spend considerable time in Paris looking after his numerous exhibits.

It is claimed that the use of electricity in the deep mines of Nevada has increased their productiveness 25 per cent.

*Baltimore American*: Electric wires seem to be of such quick-tempered mettle that it is dangerous to cross them.

DESCRIPTION OF PERRET MOTORS AND DYNAMOS.

MANUFACTURED BY THE ELEKTRON MANUFACTURING COMPANY,  
BROOKLYN, N. Y.

The chief distinctive feature of these machines is the method of constructing the field magnet whereby the well-known advantages due to lamination and to the best quality of iron are secured, while the cost, which has heretofore been a bar to the commercial use of such magnets, is reduced nearly to that of forgings. This method

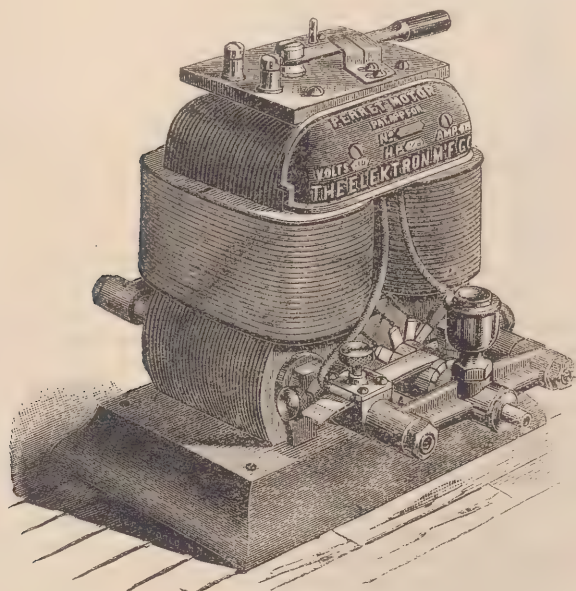


FIG. 1.

shown in Fig. 3. Upon removing the two bolts which pass through the yoke, the top half of the magnet may be separated from the lower half. Each half is then attached to a lathe or other suitable machine and wound by revolving it, after which they are put together and the bolts replaced, all these operations being very simple and very rapidly done.

One of the plates of which these magnets are built is shown in Fig. 4. Four of these are necessary to form the complete enclosure. See Fig. 5. It will be noticed that the plates interleave at the yoke, at which point their

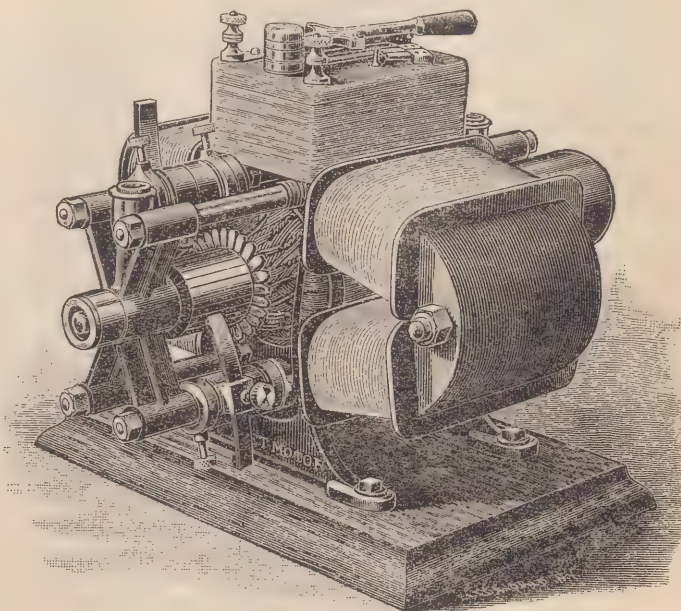


FIG. 3.

of construction is peculiarly adapted to machines of small size, and by its use their efficiency is greatly increased, as a test will show. It may also be used to advantage in machines up to ten-horse power and even higher, as by the ingenious shape and arrangement of the plates a magnet of large size may be built up of comparatively small plates, which are stamped from sheet iron, no other machine work being necessary. Eight sizes, ranging from 1-12 to 2 H. P. are now made; others nearly ready.

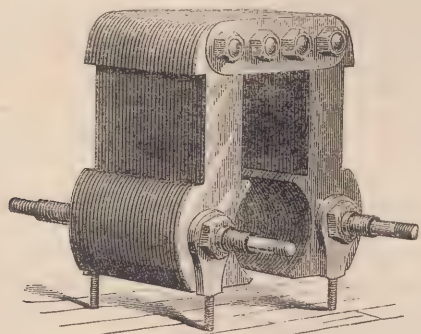


FIG. 2.

cross-section is enlarged, and they are clamped firmly together by bolts. Little or no magnetic polarity is found at the yoke, which shows that the joint is good.

An important feature is the extremely low resistance of the magnetic circuit, which is due partly to superior quality of iron, the use of which is allowed by this construction, and partly to the smallness of the air gap between the pole pieces and the iron of the armature, which is of the drum type, with teeth. In the longitudinal recesses formed by these teeth the armature coils are wound. This construction increases the efficiency, allows a large

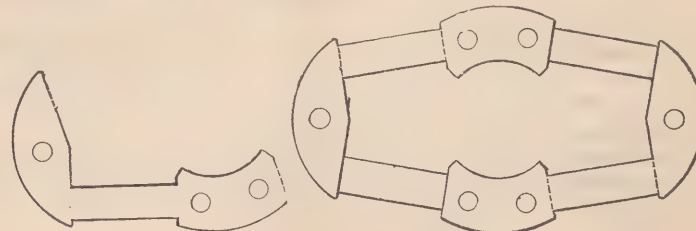


FIG. 4.

FIG. 5.

In the 1-12,  $\frac{1}{8}$  and  $\frac{1}{6}$  H. P. sizes, a magnet of the ordinary U-shape is used in which the plates are so formed and put together that the limbs may be swung apart and clamped to the face plate of a lathe for winding, after which they are swung back and bolted fast.

Fig. 1 shows one of these motors complete. Fig. 2 shows the magnet before winding.

In machines of  $\frac{1}{4}$  H. P. and upwards the double horse-shoe shape, with consequent poles, is used. These are

reduction in armature speed, and improves the regulation. As showing this, reference is made to the  $\frac{1}{2}$  H. P. machine (Fig. 3) which weighs complete with pulley seventy pounds, and has a commercial efficiency of eighty to eighty-five per cent. As a shunt-wound dynamo it will generate a current of four amperes at 110 volts when run at a speed of 1,800 revolutions per minute.

The armature is wound with 7,000 inches of conductor, which is at the rate of about 64 inches per volt, at the remarkably low peripheral speed of 1,500 feet per minute. This showing, we believe, to be rarely equaled in machines of the largest size.

It may further be stated of the  $\frac{1}{2}$  H. P. machine, that the drop in electro-motive force when run as a dynamo, and the variation in speed as a motor, are less than five per cent. between full load and no load. (See details of Prony Brake test.)

The motors are usually shunt-wound, and on constant potential circuits run at practically a constant speed, regardless of changes in load. In several instances parties requiring regulation so close that they believed compound winding absolutely necessary, have been induced to try the Perret shunt-wound machines, and have found them to fully meet the requirements.

This superior regulation is due to the fact, not always given its full weight, that the regulation of a shunt wound machine depends not only on the internal resistance of the armature coils, but also to an equal, if not larger degree on the intensity of the field. In other words, the lower the internal resistance of the armature coils, and the lower the resistance of the magnetic circuit, the closer the regulation.

This is clearly demonstrated by recent experiments with a  $\frac{1}{8}$  H. P. motor on a 110 volt circuit, which, with an armature without teeth, the air gap being 3-16 of an inch and the internal resistance 11 ohms, showed a variation in speed of 15 per cent. between no load and full load, while with an armature having teeth by which the air gap was reduced 3-32 of an inch, but with the internal resistance of armature increased to 20 ohms, showed a speed variation of only 11 per cent. The same thing is shown by the performance of the  $\frac{1}{2}$  H. P. dynamo cited above, also by Prony Brake test shown herewith.

It is, of course, not claimed that the use of toothed drum armatures is new, but Mr. Perret finds that they possess some decided advantages over plain armatures in addition to those already stated, as, for instance, positive driving of the coils secured by winding them in the recesses; also he finds that when used with finely laminated field magnets they are free from some disadvantages experienced in other constructions. It is quite certain that such armatures running in close proximity to solid pole pieces would produce heating effects therein which would be wasteful and very troublesome, to say the least. With laminated field magnets all such trouble is avoided.

A strong point in favor of these machines is freedom from sparking at the commutator, provided this is kept in reasonably good condition, and the brushes having been once set at the non-sparking point require no changing under extreme changes in load. A rocker arm for the brush-holders is therefore unnecessary, and the machine is by so much the simpler. The reason for this will be readily seen by electricians in the foregoing description, and lies in the fact that the magnetism of the field is so powerful relatively to that of the armature that no distortion of the lines of force is produced, and consequently the line of commutation remains unchanged regardless of changes in load.

A prominent electrician connected with another motor company was heard to remark, after testing some of these machines, that they were "harder to knock a spark out of than any he had ever seen."

It may be said further that these machines have been worked out very perfectly in every detail, and a high degree of mechanical skill is shown in their construction.

The armature shafts are of high grade steel. The bearings are all accurately fitted and are very long in proportion to their diameter, being in the smaller sizes of hard composition, and in the larger of babbitt metal.

The commutators, which ordinarily are liable to great wear and damage, have received particular attention, being made of a special hard bronze.

All the motors are provided with switches for starting and stopping, and in the larger sizes the switches are provided with resistance coils, an arrangement which is much handier than a separate rheostat.

In respect to simplicity they are excelled by none, all parts needing attention being in plain sight and easily accessible. The armatures may be removed for inspection or any other purpose and replaced in running order in less than one minute. All parts are made to standard gauges and are interchangeable.

PRONY BRAKE TEST, HALF H. P. PERRET MOTOR.

BRAKE H. P.	SPEED.	COMMERCIAL EFFICIENCY.
.146	2,050	.73
.185	2,048	.74
.219	2,046	.745
.250	2,044	.76
.290	2,042	.77
.320	2,040	.78
.365	2,035	.79
.400	2,030	.80
.432	2,024	.81
.467	2,018	.815
.501	2,010	.82
.535	2,000	.80
.569	1,995	.78
.600	1,990	.76

A writer in a recent issue of the *New York World*, speaking of the large manufacturers located at Passaic, N. J., says of the Okonite Company, whose factory is located there, "the story of the growth of this concern resembles more a fairy tale than a statement of blunt business facts. Started four years ago, it occupied a portion of the building (factory No. 2) of the New York Belting and Packing Company, but the rapidly increasing business of both concerns necessitated the building of large, new works for the latter, which are now in course of rapid construction. The first year's business of the Okonite Company amounted to about \$9,000, while this year's business will reach the enormous sum of \$500,000. The word Okonite is a name applied to a compound and process for insulating aerial, subterranean and submarine cables, also for telegraph, telephone and electric light wires. This process is said to have surpassed all others in flexibility, indifference to heat and cold, and all other climatic changes. It is absolutely impervious to moisture. It has stood the most severe tests and has received the highest recommendations from such practical and scientific experts as C. F. Goodrich, Commander, U. S. N. and Inspector of Ordnance; Captain A. E. Black, commanding submarine defenses of the Clyde, Glasgow, Scotland; W. C. Temple, General Manager Metropolitan Electric Service Company; J. Hopkinson, London *Electrical Review*; H. H. Rebbeck Superintendent Fire Alarm, Cleveland, O.; R. E. Thompson, Acting Signal Officer at Washington, and one of the highest authorities on such matters in this country; Geo. A. Hamilton, Western Union Telegraph Company; and many others."

The Washington, D. C., *Evening Star* recently had its boilers, engines, shafting, belting, and even the engine-room hopelessly wrecked and it was feared it would be unable to procure power and therefore would of necessity be obliged to suspend publication pending the repairs. As the presses were intact, however, it was suggested that electric motors be utilized. This was done, and as soon as the machines could be set up and connected to the electric light mains the presses were ready to toss off their thousands of copies as if nothing had happened. The C. & C. Company of New York, whose motors were used, have received unstinted praise from the publishers of the paper for the energy displayed in relieving them in their difficulty, and also for the excellent service rendered by the motors.

The Sprague electric power street car system has been agreed upon for Grand Rapids, Mich.



## NOTES.

PHILADELPHIA NOTES.—Western Chief Barto was made very happy on July 5th by the arrival of a son at his home. A new district office was opened on the 15th at 1,407 Fairmount avenue, with V. G. Hudgins as manager and W. C. Tinan, night operator. Transfers: Harvey Williams and Mr. Mills, Atlantic City; Theo. Koeniz, Cape May. Arrivals: C. W. Morris, Des Moines; H. P. Klotz, Washington, D. C.; G. W. Smith, city.

WATERTOWN, N. Y., NOTES.—No changes have occurred in the force at the G. N. W. office of late. Broker operator, J. Foster Paddock, late with the firm of Wright & Fisher, is now working for the W. U., at Syracuse, N. Y. Chas. R. Knapp is summering at Chaumont, his country home. He is at present managing a base ball team. Mr. F. E. McCormack, of Watertown, and Fred. Cruickshank, of Oswego, were in attendance at Cleveland as delegates to the O. R. T. recent convention. The dispatchers' offices of the R. W. & O. R. R. are again situated at this point. Peter Loftus and E. G. Webb look after the eastern division, while N. B. Hine and Frank Brown attend to the middle and western divisions. Business is very brisk among the Thousand Islands' offices. If the whereabouts of J. D. Cameron, an operator, are known, it is important that he should communicate with friends at Napanee, Ont., at once.

CLEVELAND NOTES.—Andy McManus has returned from Steubenville and is on the extra list. Frank Howe, who has been West about three years, is also extra with W. Brunner, of C. C. & S. R'y, and May and Abbey from Buffalo. W. C. McComb resigned to go to Oil City, Pa. It is now in order to ask Chief Operator Gurley "How's the country," as he began camp life at Chippewa Lake, July 13th. Miss Gaffey's vacation will be spent at the same place. Lehr and Coombs are off on vacation, and Guthrie will soon follow. The W. U. celebrated the Fourth in genuine style—no sham either. There not being scraps enough left in the lunch room for the rats they were obliged to fall back on the insulation covering the wires under the operating room floor; consequently two wires crossed and ignited. There was plenty of smoke for a while, but the fire was put out with chemical engines before the arrival of the fire department. "Mrs. Ber Bearney" was the address on a message, from Akron to Galion, one morning. The party not being found Galion requested better address which came "Barry." Second request resulted in "McFerney." Third request was answered the next morning with "Bernard Tearney," which proved to be correct. "Habtood" for "H. A. Blood" is what a new man wrote. "Feritt Man" for "F. E. Rittman" is the way some one in Buffalo let it pass through the other day.

HAMILTON, ONT., NOTES.—J. P. Jamieson, Jr., is back to work after a week's rest at the Beach. Chief Operator Jamieson is spending a couple of weeks in Muskoka, which place is rapidly developing as one of the finest pleasure and health resorts in Canada. A well-known operator, was sent to jail here some days ago for forming a strong attachment to a coat, stylus and other sundries, the property of an operator in this office. This city recently signed contracts for the lighting, by arc lights, of the whole city for five years at twenty-eight cents per light a night. It is expected to have the circuit completed in time for the great summer carnival next month, which, by the way, is to excel anything ever seen in Canada.

DETROIT NOTES.—Recent arrivals are Messrs. Congdon, from Jackson; J. O'Brien, Muskegon; Larry O'Brien, Buffalo, and Miss Fox, formerly manager at Eaton Rapids, Mich. Miss Keefe, from the book-keeping department, has been added to the day force. Mr. Vosburg, St. Louis,

added to extra list. Departures: Messrs. Roche and Linden to Cleveland. Mr. Billy O'Neill has resigned. Miss Carrie Boothroyd is taking a vacation and will spend a week with friends in Philadelphia. Wire chief Littlefield leaves on the fifteenth for a two weeks' vacation and trip around the lakes. Your correspondent witnessed a funny scene at one of the leading hotels the other day. A well-dressed stranger walks into the office and proceeds to register, the clerk meanwhile gazing dreamily at the line of bell boys. Stranger finishes with a flourish and clerk reaches to turn register, enquiring with the usual suave smile and manner, "are you expecting any mail Mr. — Mr.—Ah! Um-Thud." The clerk had to be carried out. He has recovered but wears a sorrowful expression, as though the supreme effort of his life had ended in a failure. The stranger had registered: "Count Ivan Haus Von-Petropermichitchkeneroff."

NEW ORLEANS NOTES.—Apropos of the greatest prize fight ever fought; well, maybe it was. There was a flood of specials sent about it, anyway, and lots of excitement generally. Knowing people were as plentiful as fleas on a yellow dog in August. Lots of the boys anticipated great sport in going out there to telegraph, as it was expected that our management would put a quad for the only wire to the ring-site. In fact, preparations to that effect had been made and our chief, Mr. West, is thoroughly equal to any emergency of that kind. A stereotype order had been issued: "absolutely no substitutes accepted for July 8th." Thus only the three or four chosen ones could witness the battle while reporting it from the ring telegraphically. I say, there was enough cleverness and influence, locally, to gain necessary knowledge of the location of the battle and make necessary arrangements. But a certain W. U. official appeared on the scene and the whole thing was knocked into a cocked hat. There was no quad put up, and the wire was "killed" for that day. Newspaper correspondents from every part of America were here and were frenzied because they could not telegraph their respective journals from the ring. It was a sight to see them when they returned from the fight at about 4 p.m.; but the *World*, New York, "scooped" them all. They had arranged for a "cullered" jockey with a fleet horse to "lay" for the incoming train, where a bundle of specials were flung to him, and he galloped off to the telegraph office fleetly as the wind and scooped the mob about twenty minutes. "Macon" McCormick was here, and sent the best (bar none) specials out of here to his several papers. Fitzgerald, of the *Sun*, comes "neck and neck" with "Macon," and knocks him silly as to chirography. There certainly was a large number of "bang up" sporting correspondents and it would take too much space to chronicle the charms of all. Every operator in the office worked like a beaver until the "wee sma' hours" and some 250,000 words of specials were sent from New Orleans that night. It would have facilitated matters greatly, and added to the receipts of the company, as all the press accepted at the ground would likely have been "day press rate," but this was not done and newspaper men "howled."

TORONTO G. N. W. NOTES.—Chief Operator McManus while at switch was suddenly prostrated a few days ago and was conveyed home in a carriage. The attending physician says it is a slight affection of the heart and has ordered him in quietude for two months at least. Mr. James Clandinan, of the night force, has returned from a two weeks' illness, he having strained his back while indulging in some exercise at home. Jim will work days until he recuperates. Arrivals: Miss Cavanagh, from Listowel, Ont.; Messrs. R. C. Rattray and Chas. H. McDonald, from Chicago, have been added to the night force. R. A. Baker is back from vacation and has secured a day trick. Wm. Watts transferred from night to day force. Miss

Lizzie Michell is now at her home in Arnprior, Ont., on a three weeks' vacation. Miss E. M. Porte has resigned and is now with the W. U. Buffalo. Mr. J. Harcourt, of Port Hope, Ont., has just returned from a trip across the continent. Mrs. Wm. Dee (nee Miss Anna Sanderson, of the G. N. W.) has been bereaved in the death of her father, the Rev. Mr. Sanderson, to whom she was very affectionately attached. This sad occurrence will have more trying effect upon our popular friend, Mrs. Dee, owing to her being deprived of witnessing the last ceremonial rites of her deceased father on account of her new residence being in Victoria, B. C. She has the sympathy of many warm friends, who became endeared to her, in the telegraph circle. Norman McCallum has been promoted from a branch office to the main office; he makes a splendid attempt for a beginner. Messrs. Collie and Lily, of the C. P. R., have just returned from a successful fishing expedition at Bobcaygeon. Miss Watson, one of our subscribers at Port Hope, has invested in one of the latest improved tricycles. She states that the machine affords her very healthful amusement and recommends the sport to her sister telegraphers. The Misses Wynn and Smith, of the C. P. R., will take a month's vacation, starting on the 15th inst.

BOSTON NOTES.—Never has there been such a scarcity of news telegraphic as at the present writing. The majority of the Boston fraternity are engaged in working extra in a manner which would indicate several vacations to be in order by the first or middle of August. Of late years, however, vacations are a luxury which very few of our Boston friends indulge in, owing, not to the scarcity of substitutes alone, but to the fact that no extra operator is willing to agree to work through August and September and thereby risk his chances of getting a regular position for the winter. No appointments to regular positions are made after September 1st, as the closing of the summer hotels sends back to the city a large number of the regular force. The Boston Pool-room managers have invariably insisted upon hiring female operators only. It was decided recently by the Western Union, for the benefit of the service, to replace the ladies in all the pool-rooms with male operators. This plan was met with most strenuous opposition by the pool-room managers, but the inevitable had to be submitted to. Messrs. J. A. Tew, C. W. Rice and J. H. Lawson, of the W. U., received the appointments and the lady operators were assigned positions in the City line department. As may be readily imagined the reason for hiring the lady operators in the first place was on account of fear of the gambling propensities to which not only male operators, but the male sex in general, is known to be prone to. The pool room work is said to be unsuitable for lady operators. Many operators whose names have been on the AGE subscription books in the past, decline to subscribe at the present day, claiming that their papers never reached them. Arrangements were made some time ago whereby every operator receives his paper as safely and surely as the little envelope and its contents on pay-days. Complaints regarding non-delivery are now unheard of. Very much has been said in these columns on the subject of borrowing the paper, so much, in fact, that it is very unpleasant, though necessary to write on the subject. It is sufficient merely to state that the number of operators who depend upon seeing some one else's copy (thoughtlessly, we know) greatly exceeds the number of actual subscribers, but to what extent, we are quite ashamed to admit. Your correspondent was recently informed by a well-wisher that the foregoing facts should be mentioned in the paper. We therefore place the matter before our readers and hope that an increased subscription list will be the result.

PEORIA, ILL., NOTES.—The *personnel* of the W. U. office is as follows: Mr. B. H. Griffin, manager; F. H. Jacobs, chief operator, with Messrs. Straub and Brehm on Chi-

cago, Anderson and Halloran on way wires and Kasdorf on split trick; Eiterman takes day report and Baker night; J. B. Hammott is cashier, assisted by Wm. Goucher as book-keeper and night clerk; Miss Hadley is day clerk. The delivery department is in charge of Master Larry O'Loughlin. The Postal company is doing a good business at this point under the able management of P. F. Brons, assisted by James O'Brien as operator. The United Press report is taken at the *Herald* by W. S. Brons and at the *Journal* by Geo. W. Castle. At the Stock Yards T. O'Brien takes care of the W. U. business. Master Sullivan is at the National Hotel. The whiskey trust has loops from both the W. U. and Postal, which are taken care of by Chas. Brons. We manage to keep posted through the AGE, which is well received here.

DETROIT NOTES.—Mr. Alfred Lowther is away on a six weeks' vacation, and rumor has it that he will not return alone but will bring with him a life companion. Mr. Lowther is one of the lights of the night force; he is also a rising young dentist. We wish him success and extend our congratulations. Congratulations are also in order in another direction. Mr. Robert Cuppage, who is widely known among the fraternity, was married in this city, July 17th. The AGE joins with his numerous friends in wishing him happiness. Miss Julia Driscoll, a most estimable lady, has resigned. Miss Driscoll's departure occasions general regret and she carries with her innumerable wishes for good luck of which she is certainly most deserving. Mr. Tracy from New York, and Mr. Kelleher of San Francisco, are recent arrivals. Mr. Kelleher has been assigned to the Chicago local, *vice* Mr. C. F. Avery, who has gone on the split trick. Miss Jessie Ellis and Mr. J. F. Carroll transferred from split trick to days, and Mr. Fred Cruise days to split trick.

PHILADELPHIA NOTES.—Exclusive of one tie game the Postal ball teams' record stands eight straight victories. How's that? The latest arrivals are: Mr. Frank Halloway, from A. D. T.; Mr. John McCloskey, from New York, and Mr. James Mattson, from A. D. T. "Diamond Jack" Irwin is rusticated in the vicinity of Landenberg, Pa.; Mr. J. P. Williams is assistant in the Dry Goods district, and F. W. (popularly known as "Curley") Jones, scoops in the extra daily at the Commercial Exchange, assisting Mr. H. E. Butcher. "What's the excursion rate?" is the way a customer asked for information about a prepaid reply in one of the branches a few days ago. Miss Sallie W. Killion, who but a short time since mourned the loss of a brother is again brought to sorrow by the death of her father. Our deep and tenderest sympathies are tendered to her in this great affliction; also to Mr. H. T. Wright, of the Dry Goods district, who recently buried his little girl. Mrs. P. M. Dickel enjoyed a short vacation and is again at her place in the city department.

KANSAS CITY NOTES.—Very warm and business good. The operators had a half holiday on the Fourth and had a general good time at Troost and Exposition Parks. Miss Lovelace just returned from a two weeks' visit home and looks "fresh from the country" again. Misses Reid and Chiles are visiting their homes in Cleveland, O., and Bismarck, Mo. H. E. Bender and Dr. R. N. Cresap have resigned to engage in other business. They have the wishes of the fraternity for success. Late arrivals: Keeler and Staley from Postal; Stanley from Salina, Ks.; Pollock and Sanderson from Springfield, Ills.; Messrs. Peach and Chaddick have emigrated to climes more congenial—too warm here. W. E. Jones on all-night trick, *vice* Sullivan rusticated. Mr. Dunning transferred to night force. Mr. Hatch, for several years chief of Wheatstone, has resigned. A recent arrival at the home of Mr. Grass causes his absence from duty—it's a girl. Mitchell, Dillon and Castelaw are on the sick list. Fred B. Ford is in charge at Board of Trade, *vice* W. J. Marshall, transferred to main

office. Night wire chief Dunn is back from visit to New York; B. C. Elder, late chief operator at Wichita, Ks., has accepted a position with the W. U. here.

**BALTIMORE NOTES.**—Calverton Stock Yards district is in charge of Mr. Koethe. Receiving department at main office is in charge of Geo. J. Fischer, our genial cashier, assisted by Messrs. Wolmsley and Belt, with G. W. Green at night.

**WASHINGTON, D. C.**—The Postal has moved into its new quarters at 1423 F street, occupying the entire second floor. The operating room is a bright, cheery room, having a southern exposure and is well lighted and ventilated by large windows which extend from the ceiling to the floor and open out upon a pleasant veranda on F street. The new switchboard is a very handsome affair, and being manufactured expressly for the purpose, is well adapted to the needs of the office. It is a double spring jack with a capacity of forty wires, and an auxiliary switch carrying twenty-four wires, all neatly encased and occupying a position at the north end of the operating room. The switch case is enclosed both in front and rear, thus making the accumulation of dirt and rubbish, so common under and around switchboards, an unnecessary feature in this case. The main lines and the city wires and loops all enter the building, through cables, at the north end of the operating room, immediately behind the switch. They are there distributed to a series of "fuses" and lightning arresters which occupy a vertical position on either side of the cables against the wall. Being in plain sight and easy of access they admit of prompt and thorough examination with a minimum amount of trouble in cases of lightning or electric light crosses. From this point they are distributed to the switch by means of short sections of cable. An incandescent lamp is suspended in front of the arresters and behind the switch, thus farther facilitating examinations of connections at night or in very cloudy weather. The operating room has a desk capacity for thirty-six operators. Three quadruplex and three duplex sets and a number of single sets are now in daily use. Four district call-box circuits are placed in the north end of the room near the chief operator's desk, thus enabling him to keep an eye on this important branch of the service. His desk is situated immediately in front of the switchboard, from which point he can command a view of the room and men. The office is wired with No. 12 gauge kerite cables, which are enclosed in tin troughs and pipes under the floor. All the quad. and duplex locals are connected with a system of spring jacks which admits of connecting branch loops or wires to any set in the office at a moment's notice, and at the same time renders it possible to convert any two sets into duplex or quad. repeaters without the slightest delay. The office is lighted by incandescent lights. The battery room is situated in the rear of the operating room, which makes the inspection of the battery and the detection of battery "bugs" an easier matter than has heretofore been the case with the battery a square distant. The location is opposite the Western Union and only a few doors east of the old Mutual Union stand.

**WINNIPEG C. P. NOTES.**—Mr. B. S. Jenkins is superintendent; John Tait, local manager; S. Edwards, inspector; R. Waller, (Supt's) clerk; David McIntosh, cashier and receiving clerk; Horace Howard, bookkeeper; John McDonald, delivery clerk; George Percival, check clerk, days; A. Ingo, receiving clerk, nights; R. J. Smith, delivery clerk, nights. Operating room, days; R. J. Pennie, chief; W. J. Kane and W. I. Steward, New Westminster, duplex; F. M. Thompson and H. McIntyre, Montreal; I. M. Woodford, No. 2., West as far as Donald, B. C.; Thos. Masters, No. 4, Way offices, West. Nights; W. Rutherford, chief; C. E. Gooding and W. H. Edworthy, New West., duplex; W. A. Dier and J. J. O'Callaghan, New York, duplex; A. H. Galey,

Montreal, single; Harry Masters, Way wires; W. A. Decow, all night. P. A. Cook has transferred from Winnipeg to New Westminster; W. F. Muth has been appointed manager, Donald, B. C. office. Arrivals: W. H. Edworthy, W. U., St. Paul; A. H. Galey, formerly of Montreal. All hands work quite hard, as business, although always heavy, is continually increasing. Superintendent Jenkins is alive to the importance of making the facilities adequate to the demand and growth of the telegraph business here.

**NEW YORK WESTERN UNION NOTES.**—Probably the smallest working telegraph relay ever constructed is one recently exhibited by Mr. Edward Blakeney, Western Traffic Chief. Mounted upon a suitable base it could conveniently be carried in a vest pocket. It is operated entirely without the aid of magnetism, the electric current passing through chemicals contained in a small metallic cup, and acting on a needle suspended therein, furnishing the attractive power, causing a delicate armature to close the sounder local circuit. Working in a Western way circuit, with only *one-three hundred and fiftieths* of the full current of the line passing through it, the little instrument turned out the Morse as neatly as could a full grown one possibly do it. This form of relay originates with Mr. Blakeney, whose electrical and mechanical abilities are well known. Mr. B. thinks that his invention has not as yet reached a practical standard. We hope that he will continue his experiments to a practical result. Omission in the last number of THE ELECTRIC AGE having been made of the fact that Martin J. Dixon spent a most enjoyable time on his vacation of one week, it is included in these notes. He returned greatly benefitted in health. Eddie Hodnett, one of the brightest junior operators it has ever been your correspondent's good fortune to meet, has gone to the Postal across the street. "Eddie," as he is familiarly known, has in him the making of a "dandy" operator. Gus Kranshaaer has the sympathy of many friends over the loss by death of his little girl, which occurred a few days ago. Joe Van Cura is spending a needed rest at Peekskill on the Hudson. His comrades on the 6 to 3 force miss his cheery countenance as well as his musical voice. Frank Clark, having resigned his position on the all night force for a more desirable one on the division over which Chief Jackson presides on the South, his place has been taken by that eminent vocalist and charming companion Arthur F. Hurd. Harry DuSouchet, late of the *World* staff, has changed places with Louis F. Kirschbaum of the 1 to 8 a. m. force. A bonus of \$20 to \$25 is being offered for an opportunity to change to the latter force. Robert Daniels, late of the Wheatstone department, has been transferred to the Catskill Mountains. John Ferry has been assigned to the Buffalo quad, *vice* Geo. W. Ford to a pool room. Other changes are reported as follows: M. J. Toomey, 5:30 *vice* Byrne, who has accepted a position in a pool room; McBride to the split trick *vice* Clampitt, 7 o'clock force; McCutcheon to a pool room; T. Foley, 11:30 to 9, *vice* Joe Winder, 7 a. m., who takes the place of Mr. Gregg, transferred to a pool room; Fred. Barlow, 11:30 to 9, *vice* Mr. Moore, 7 a. m.; Quinn, Lee, Thompson, Rath, Moran and Mahoney to pool rooms; Messrs. Hanson, Cornish, Hamilton, Jones, Hutton, regular day force; Byrne, W. B. Richardson, Driscoll and Hammond 11:30 to 9; Lon Bartholomew to the 7. a. m. force. John Skirren has returned from a vacation spent at Asbury Park. The hours of Messrs. Colquhoun and Smith in the Wheatstone department have been changed to 6 p. m. to 2 a. m. Chief Operator Ed. F. Howell, accompanied by his wife, recently paid a flying visit to her former home in Nova Scotia. Two days after their return home the sad intelligence of the death of Mrs. Howell's mother was received. George Blood has been made happier than ever by the arrival at his home of a little son. Chas. L. McKee, of the day force, died at his residence, Jamaica, L. I., Monday, July 22nd, and was buried July 24th. Messrs. D. P. Smith, Skidmore, J. A. Murray, Lounsberry and E. E. Brannin attended the funeral and acted as pall-bearers. Mr. McKee had been a patient sufferer with consumption for a long time, but was never known

to complain when on duty. He was a steady and faithful worker. His last appearance was on June 28th. Noting his protracted absence Chief Brannin requested Mr. Canning at Jamaica, to call upon McKee and report his condition. Mr. Canning gladly complied, and reported McKee very ill, and in want. Mr. Brannin immediately informed the relief committee of the Aid Society, who forthwith furnished means for his relief up to the time of his death. Operator Canning at Jamaica also took a deep interest in the case, and notified the relief committee of the Potestant Episcopal Church, who, through Mrs. A. C. Denton, rendered valuable assistance financially as well as otherwise, administering to Mr. McKee's many wants to the end. Your correspondent, on behalf of the Tel. Aid Society and the fraternity in general, takes this opportunity of thanking Mrs. Denton for her timely aid and the kindly interest she has taken in this case. She is indeed a noble woman. Mr. McKee's only child died of brain fever on Saturday, 21st inst. Mrs. McKee has the sincere sympathy of the fraternity. We understand Mr. McKee's married sister, Mrs. Denton, and other friends will kindly look after his wife's future welfare. Mr. McKee belonged to no insurance or aid organization. The New York Tel. Aid Society took charge of his case, and furnished aid up to the time of his death, and also paid half of the funeral expenses, amounting to \$50. Charles Barto reports having spent a most enjoyable vacation of one week among old friends and associates of his boyhood days, near Albany, and his appearance certainly bears out the assertion. Miss Alice Murphy and Miss Vatel are spending their vacation at Haverstraw, N. Y. Miss Maggie O'Connor has been appointed operator at Hunter, N. Y.

NEW YORK POSTAL NOTES.—Arrivals: Mrs. M. Fones, Miss C. Macy, L. P. Darmstatter, Thomas Flynn, Walter Holbrook, L. K. Miller, W. C. Craig, J. P. Regan, E. Hodnett, J. D. Wooten and C. E. Davis. Departures: A. C. Thweatt, J. J. Daley, C. Brennesholtz, C. B. Squires, R. L. Kitts, J. A. McDonald, C. McLellan, E. O'Grady. On vacations: Miss Guthman, Annie Conway, Lizzie Lewis, L. G. Diamond, C. Richardson, J. P. Moore, C. Stevens, R. A. Halligan, H. F. Warren, M. F. Keane, J. Stack, P. F. Larkins and D. B. Murphy. C. W. Flagg and Miss A. Boyle have just returned from vacation.

TRANSFERS.—J. M. Connor, Worcester Mass., to New Britain, Conn.; J. S. Knapp, Buffalo, N. Y., to North East, Pa.; William Wall, Ottawa, Ont., to Sault Ste. Marie, Mich.; O. C. Sappers, Taison, N. C., to Savannah, Ga.; O. M. Mitchell, St. Paul, Minn., to Winnipeg, Man.

BASEBALL.—A picked nine, captained by Mr. Gardner Irving, and the Stevens' nine of the New York Tel. Club, crossed bats at Prospect Park on the 24th inst. The game was a well contested one, and proved beyond a doubt that there is good baseball material on both sides. The Stevens nine were resplendent in their new uniform of gray with red stockings, while the Irving men appeared in various costumes, flannel shirts predominating. The features of the game were the fine delivery of Nicholson, batting and fielding of Dean and base running of Irving, and a fine catch by Sullivan. Beyond the excellent catching of Matthews, for the Stevens nine, there were no remarkable plays made. The score:

Irving Nine.....o o 5 o o o 2—7  
New York Tel. Club.....o o o o 1 4 o—5

NEW YORK TELEGRAPH CLUB.—We are indebted to the editors of the *Electrical Engineer* for a copy of their monthly publication for the current year; also to Mr. John Brant for a picture of the venerable doorkeeper at 195—Mr. Thos. Finnegan; to Supt. Humstone for pictures of Messrs. Cyrus W. Field, D. Doren, J. Merrihew and J. Van Horn, and to Millie Patterson for a valuable contribution to the library. The first "ladies' night" (July 10) was well attended and bids fair to become one of the most enjoyable events in

the history of the club. Great preparations are being made for a grand picnic to be held at Lion Park, August 21st. Conrad Meyer, as chairman of the committee, is bound to make the affair a most pronounced success.

John G. McCloskey has been added to The United Press regular force and assigned to the Western Circuit, nights. He started in Monday, May 13th, and had been at work but three hours when he received word that his mother was dead. Mrs. McCloskey was but fifty-three and a half years old and had been troubled with catarrh of the stomach for years, and it finally caused her death. This is the second death in Mr. McCloskey's family this year, his five-year-old boy, Stephen, dying New Year's morning of tubercular meningitis. Now Mr. McCloskey's wife is in bad health.

Eddie F. Hood and Charles Hayes, of the Associated Press, Washington, D. C., passed through New York a few days ago *en route* to Maine, where they expect to pass an interval in search of fish. Their New York friends received a pleasant call from these gentlemen.

Several parties have been urging Mr. D. W. McAneeny to repeat the concert given him last winter by his friends in Chckering Hall, and the probabilities are he will accept the management of the affair, which is to take place in November or December.

Mr. James P. Gardner, of The United Press, and wife, are sojourning in the Catskill mountains. The many friends of Mr. Gardner hope that he will return much improved in health if not in spirits.

Mr. Tom O'Reilly is now editor-in-chief of the *Journal of The United Labor*, the organ of the Knights of Labor. It is published in Philadelphia and enjoys an immense circulation.

The Old-Timers and Military Telegraphers meet in Louisville early in September. Preparations are being made to give the attending members a rousing time.

The Civil Service Commission held an examination for telegraph operators a few days since in their rooms in the Public Buildings, Philadelphia, Pa.

Mr. P. S. Eagan, of The United Press, Pittsburg, Pa., is joyously celebrating the advent of a baby boy at his residence, which is his second.

The Philadelphia *Evening Telegraph* now receives its New York news from the latter city directly by telephone.

THE ROE FUND.—Amount last reported.....\$427 65  
John Franzan, Meriden, Conn.. 1 00

Total.....\$428 65

WANTED.—The undersigned desires the address of Alfred Woodhams, late of the W. U., New York, who met with an accident some time ago. Address Arthur E. Harris, care Spencer, Trask & Co., 16 Broad street, New York.

DIED.—G. E. Shoemaker, well known in the W. U. circles of Philadelphia, died in St. Louis, Mo. His interment took place at Harrisburg, Pa., on the 24th. Mr. Shoemaker was a popular operator and many friends will mourn his loss.

DIED.—John Roe, the well-known old-time operator, died at Binghamton, N. Y., July 26th, and was buried by the Masonic fraternity July 28. The Binghamton operators attended the funeral in a body and contributed a beautiful floral design.

DIED.—Gurdon C. Mead, a well-known telegrapher, died at Troy, N. Y., July 11. Mr. Mead was well known throughout the country, having traveled considerably.

## WIZARDS OF THE WIRE.

HOW TELEGRAPHIC COMMUNICATION IS RESTORED WHEN CUT OFF BY FLOOD OR STORM.

(From the Philadelphia Record.)

The great flood in the Conemaugh Valley afforded numerous examples of what a telegraph company can do in case of great emergency. Fourteen Western Union wires ran through Johnstown along the Pennsylvania Railroad, but after the flood had passed not a single wire remained in working order. From the east there was no communication nearer than Huntingdon, seventy-five miles away, and on the west the nearest point of telegraphic communication was New Florence, thirteen miles from the ruined city. Owing to the floods on the Potomac the wires along the Baltimore and Ohio railroads were in useless condition.

The Western Union's first communication from this city with Johnstown was by its line along the old State turnpike to Bedford, Pa., thence by the Huntingdon and Broad Top Railroad to Huntingdon, thence by a telephone wire to Martinsburg, W. Va., and thence by telegraph along the Baltimore and Ohio and Cambria and Somerset railroads into Johnstown. This roundabout and patched-up line was used for a day and a half, until one of the wires from Pittsburg to Johnstown had been restored.

Even with a wire to Pittsburg there was no direct communication thence to the East. All despatches from Johnstown were received in Pittsburg and then repeated for their destinations in the East. The only circuit that could be used for this purpose was from Pittsburg to Cleveland, thence to Buffalo, then along the New York Central Railroad to New York, from which city the wires brought the messages to Philadelphia. During the first week all despatches came East in this manner, and for over another week they were sent by the same route over a continuous wire without repeating in Pittsburg. The operators in Johnstown worked under great disadvantage in a little oil-soaked shanty, sitting upon boxes and barrels, and working by candle-light at night. In spite of the difficulties of the situation the dozen operators handled an enormous amount of press matter. It was impossible in the confusion to keep account of the matter sent away, but it was estimated that not less than 50,000 words were handled in a single day.

While the above may seem interesting enough, an equally marvelous feat which has heretofore never been mentioned was accomplished over the Commercial Cables during the great blizzard. W. W. Frazier, of Harrison, Frazier & Co., Philadelphia, had been trying for three days, under the most intense anxiety, to reach his wife—who was in Boston—by wire, to know whether she was safe among friends or had started for home, as agreed upon, and been frozen to death *en route*. Having failed, he started for New York over the Pennsylvania R. R. (which had just opened its lines) in the hope of finding telegraphic communication intact between New York and Boston. Luck seemed against him, as every telegraph office, save for the ticking of a few short city wires, was silent as a tomb. The Western Union, with its 252 wires, and Postal Co., with its 24 wires to Boston, were as if they had never been. In his frantic efforts Mr. Frazier visited the large telegraph offices, offering any amount of money to get word from his wife by wire. His last attempt was with Manager McClary, of the Postal Co., 91 Wall street, and after diligent inquiry found that one wire was working to Boston, via Erie R. R. to Buffalo, Albany, Springfield, Worcester and Boston, but swinging so badly that a message could not be gotten through. A brilliant idea struck the ever thoughtful manager—to reach Boston via London, over the Commercial Cable—and when this was mentioned to Mr. Frazier he almost staggered at the

magnitude of such an undertaking, exclaiming, "Do it, and here is five hundred dollars for you." Not stopping to take that part into consideration Mr. McClary hurried to the Commercial Cable office, three blocks away, hastily consulting Harry Lee, and in less time than it takes to tell it, the message was in London, thence back to Boston, on cable number 2, which terminates at that city.

It must be remembered that the Commercial, with its all cable route, was working serenely under Mother Ocean, but fairly groaning with the pressure of business, taken subject to 24 to 36 hours delay, all other lines being completely prostrated.

In one hour and forty minutes, much to the surprise of all concerned, back came the reply "via London" signed Mrs. Frazier, and saying she had not started as expected, and was safe and well in Boston.

It was only through the greatest efforts that Mr. Frazier was induced to retain his wealth, and could be made to believe that only the tolls of the message were required. A box of cigars all around was finally accepted, and there was joy on both sides.

FAURE SECONDARY BATTERY SUIT.—Judge Coxe, in the United States Circuit Court for the Southern District of New York, rendered a decision, on July 22d, reaffirming his former judgment in favor of The Electrical Accumulator Company in its suit against The Julien Electric Company, to establish the validity of the Faure Secondary Battery patent, and denying the Julien Company's motion for a rehearing.

The Julien Company in its argument claimed among other things that it could manufacture batteries by the "dry powder" process as good or better than it was possible to manufacture under the Faure process by the use of a "paste," and in this connection Judge Coxe said:

"If it be true that Faure's batteries are inferior to or no better than others, the question naturally suggests itself: 'Why are not defendant's content to use other batteries?'"

"A rehearing is denied."

According to the views of The Electrical Accumulator Co. this gives the complete control of the manufacture and use of secondary batteries to that company, which owns the Faure-Sellon-Volckmar patents.

PERSONAL.—Captain Willard L. Candee, treasurer of the Okonite Company, of New York, returned from his European trip on the 4th instant. He succeeded, besides taking several smaller orders, in making a contract with the city of Paris for 8,000 feet of Okonite telephone and telegraph wire. Captain Candee examined many important locations in England, with a view of establishing a manufactory there, to supply the steadily increasing European demand for Okonite wires and cables. The Captain gives a glowing account of the American Department of the Paris Exposition, and says the electrical goods manufacturers are not one whit behind the other great industries, notwithstanding that as yet the manufacture of electrical goods is only in its infancy.

The Aurora people should look out when they try to kill dogs with electricity. The experts testifying in the Kemmler case in New York as to the power of electricity have told about reviving an apparently dead dog by burying him and allowing the earth to draw off the electricity in his body. Aurora may have a startling resurrection of her canines.

William Brookfield, the well-known manufacturer of screw glass insulators and battery jars, has removed his office from 45 Cliff to 83 Fulton street.

George G. Ward, general manager of the Commercial Cable Co., is taking a well-earned vacation.

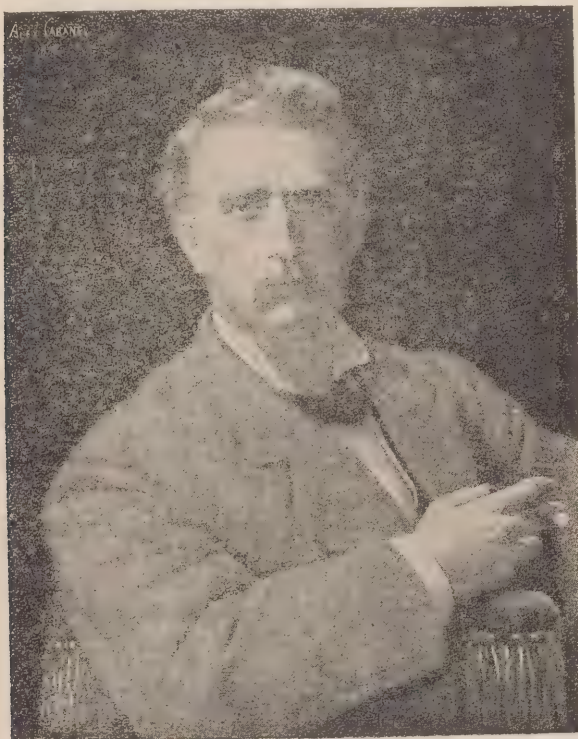
## A TRIBUTE TO THE SILVER KING.

THE COMMERCIAL CABLE STAFF HONOR THEIR PRESIDENT.

On Tuesday evening, July 23d, a deputation of fifteen members of the staff of The Commercial Cable Company waited upon President John W. Mackay, at the Windsor Hotel, and made the formal presentation of the album, which was intended to accompany the silver piece sent to him Christmas day last, but which has been delayed by the difficulty in obtaining the signatures of the members of the transatlantic staff.

Mr. Morgan Williams, formerly of Liverpool, acted in the capacity of orator and addressed Mr. Mackay as follows:

MR. MACKAY: My colleagues have selected me for the honor of being their spokesman to-night for the reason, I believe, that before my appointment in New York I was attached to one of your stations in Europe, and am therefore familiar with your service on both sides of the Atlantic.



JOHN W. MACKAY, OWNER OF THE COMMERCIAL CABLES AND THE POSTAL TELEGRAPH SYSTEM.

Our purpose is to complete a project which we have prosecuted with affectionate interest for some months past, and it now affords us much gratification to ask your acceptance of this album. It contains the address which was intended to accompany the silver piece on Christmas day last, and is signed by the entire staff of the company. The album has been delayed far too long in consequence of the difficulty of obtaining prompt return of the pages from the distant stations. Nevertheless we trust it may not, on this account, lose interest to you, but that it will prove a pleasing remembrancer of the success achieved by your company in a momentous contest, and a constant reminder of the esteem in which your employés hold you.

The past four years have been rich in events, having important bearings upon our future. Our admiration has been excited by your sturdy, unflinching courage, during the most gigantic cable war which has ever been inaugurated—a war which was forced upon you by opponents

of tried strength and of long experience in the methods of subduing competitors; opponents who were flushed with constant victories over others who have essayed to be independent; opponents who were entrenched in the possession of privilege and prestige; and yet, during all the struggle, animated by your noble example, the "Commercial" unflinchingly fought a stubborn and protracted fight until it attained the proud position of untrammelled independence by right of its own strength and excellence. And now, supported by an enlightened public opinion, the company has, we believe, entered upon an era of progress and success, and we give you the assurance that our efforts will be as earnest and unflagging in the future as in the past, and by unceasing vigilance place the service of the Commercial on the highest plane of excellence and thus justify your confidence in us.

It was the consideration of the gratifying results here spoken of that caused the inception of the project of embodying the personal regard and pride with which we regarded you in some permanent form—a project which has had the hearty co-operation of every member of the staff, from our honored M. D. V. P. and G. M. down to its youngest member, and a project which, taking the form of the silver piece, was intended to reach you on the fourth anniversary of the formal opening of the company to the public and to be accompanied by the album which is now handed to you, which we beg you to accept in the same spirit in which it was conceived. We should like you to know that the album has been reproduced in sufficient number to provide each signatory with a copy.

It only remains for me, on behalf of my colleagues, to wish you and your family good health, long life and continued happiness and prosperity.

Mr. Mackay replied: Boys, I am very much pleased to meet you all, and I can only say that I deeply appreciate this unexpected present. I am afraid you have spent too much money on it though. It is a beautiful album and I thank you very much. I received the silver piece at San Francisco and have it placed in my rooms there. I shall always treasure it very highly and hand it down as long as my family lasts as a precious heirloom. You must convey to all the boys who were not able to be present here to-night, especially those at distant stations, my warmest thanks.

In your address you mentioned the cables. We have had war, but after war comes peace. We have peace now and I hope it will continue for a long time. I think the success of the company has been due to the efforts and good work done by you and your colleagues on the other side of the Atlantic, to whom you must convey my earnest appreciation. I think the cables can be safely left to Mr. Ward and the staff.

At the close of the formal proceedings a most delightful evening was spent in social intercourse between President Mackay and his employés, during which remarks were made by Vice-President de Castro and General-Manager Ward, who, in proposing the health of Mr. Mackay, with musical honors, voiced the sentiments of all the staff when he said "we wish to say that we feel it a great privilege to work for you."

The album contained, among other good things, the following lines by Cableman John Morrison, of Canso, Nova Scotia:

*To John W. Mackay, Esq.*

Tried chieftain, generous master, friend,  
Whose words are deeds, whose thoughts are actions true;  
In freedom's cause, oppression's power you rend;  
Tributes of worth in honor's path you strew.

Long may kind wisdom grace thy noble brow,  
And mark thy pilgrimage through life in peace,  
So that the burden of thy work shall grow—  
A lofty fabric, merit's proud increase.

And if, perchance, aught worthy there appears  
In humble effort honor to bestow,  
The sign of tribute which this volume bears  
Is but a shade of gratitude we owe..

The following is by Cableman Poole Davis, of Bristol, England:

How vast the chasm parting rich from poor  
None know so well as they whose happy fate  
Hath led them from the gloomy nether shore,  
By paths adventurous, to the higher state.

And this, thy honor, Mackay. Thou dost know  
The dreadful way between, yet dost not cease  
To stretch out helpful hands to those below,  
Bridging the gulf with human sympathies.

Thy tender feelings span the gulf profound,  
E'en as thy cables the Atlantic span,  
And with our thanks two continents resound,  
All hail to thee, our kindly fellowman!

### THE NATIONAL ELECTRIC LIGHT ASSOCIATION.

PLAN OF WORK—NATIONAL COMMITTEE ON STATE AND MUNICIPAL LEGISLATION, BY A. R. FOOTE, CHAIRMAN.

1. An examination will be made of the laws in each State to see in what particulars, if any, the Electrical Industry can be benefited by securing any practicable change in such laws.
2. All bills, affecting in any way the interests of the Electrical Industry, that were introduced at the last session of the legislature of any State, but which did not become laws, will be examined to ascertain the *tendency* of legislation and to see if it is desirable that they should be passed.
3. Whenever any legislation is desired in any State, or if legislation is proposed that is not desired, copies of the bill proposed will be furnished to the Chairman of the Committee. He will then furnish the member of the Committee for that State such data, arguments and citations as he may be able to provide, to enable said member to place information in the hands of proper persons through whom the desired result may be secured.
4. All work done in one State will be kept in printed form, so that it can be used at once in any other State. The work will thus become accumulative, and of such a thorough character as to be practically irresistible.
5. No legislative measure or economic principle will be advocated in any manner in the name of the Committee without the approval of a majority of the whole number of its members, nor will the Committee undertake to secure legislation in any State without the approval of the members for that State, and then only when sufficient preparation has been made to render success a reasonable certainty.
6. Each member of the Committee will recommend to the chairman an attorney for his State, who will receive and preserve for reference, copies of all documents published or approved by the Committee, to the end that if at any time it becomes necessary to employ counsel in that State, or if any special interest requires such service, said attorney will have the desired information and can represent the Committee, or such special interest as may wish to employ him, and have at his command much of the data necessary to familiarize himself with the subject.
7. All other considerations being equal an attorney residing at the capital of the State will be preferable.
8. The funds of the Association are not to be used for any of the expenses of this Committee in any manner whatever.

The Sprague Electric Railway and Motor Company, of New York, has closed contracts for 32 cars for East Cleveland Electric Railway, of Cleveland, O., and five cars for the Squirrel Hill Railway, of Pittsburgh, Pa.

A new trial has been ordered by the General Term of the Superior Court, in the suit of John G. Farnsworth, as receiver of the Bankers' and Merchants' Telegraph Company against the Western Union Telegraph Company. At the trial in the Circuit Court the jury brought in a verdict giving the plaintiff damages on account of the action of the Western Union in cutting the wires of the Bankers' and Merchants' Company. Judge Daniels, who writes the opinion, holds that the plaintiff was allowed at the trial to introduce improper evidence.

We acknowledge receipt of a lecture, in pamphlet form, on "Ocean Telegraphy," delivered by Patrick B. Delaney, before the Franklin Institute recently. It is fully illustrated and contains considerable interesting reading.

Mr. P. J. Casey, manager of the Western Union Co., at Long Branch, N. J., proposes to introduce the Shaver telephone between Long Branch and Sandy Hook, in connection with the District Company, of which he is general manager.



CAPTAIN WILLARD L. CANDEE, TREASURER "OKONITE" CO., NEW YORK.

The Postal offices at Alexandria, Fredricksburg and Richmond have been opened to the public, and a fair business has been secured.

Thomas A. Edison, though he might not be accepted as a theoretical electrical expert for want of college education in the natural sciences and in higher mathematics, is probably as familiar with the effects of electricity as any man living. His positive testimony that an electric current could be made to kill a man instantly and painlessly is therefore to be taken as entitled to the very highest consideration. Mr. Edison is accustomed to employ experts to make calculations for him, but he readily detects an error in results by his general knowledge of what those results ought to be. He is in fact, though without scientific training in the ordinary sense, the very best kind of a scientist, and can puzzle the doctors when he is dealing with his specialty.

In France electricity plays organs.

## THE MAGNETIC CLUB CLAM BAKE.

On July 19 the Magnetic Club enjoyed a clambake at Glen Island. Although the weather was threatening, one hundred and fifty members and guests were present. The sail up the sound was quite refreshing, the time being occupied in reciting stories, singing, etc. President Bruch called the meeting to order and invited Mr. T. P. Scully to say grace, after which a bountiful dinner was served.

Mr. Bruch then commanded Mr. W. L. Ives to act as chairman. Upon taking the chair the Senator delivered one of his characteristic speeches, in which he paid his respects, in a humorous and pleasing manner, to several of the old-time telegraphers present. The Senator's prepared speech is still in his pocket "waiting."

The chairman then called upon Mr. W. J. Dealy to respond to the toast "The Magnetic Club." He spoke as follows:

MR. PRESIDENT, LADIES AND GENTLEMEN: The Magnetic Club has a meeting in each season of the year—one in the spring, one in the summer, one in the autumn and one in the winter. If there is ever a time when we ought to be sociable, it is when we are brought together, as we are now, at one of those meetings. The object of the club is, as we all know, to promote sociability, and when we consider what that means, and how many are the advantages that follow, there would seem to be no other object necessary. We need recreation, and by sociability we get it. What can make us better forget the perplexities of business or the anxieties of life, than for the time being to set them all aside for the pleasures of a sail on the Sound and a few hours' cheerful pastime on this beautiful island? And what can better bring back to those of us whose years have marked their lines, the fullness of the joys of earlier days, than to recall those joys in a social way at a meeting of the Magnetic Club? And mindful of the seasons of those meetings, what better employment can we have than to cull for one another the blossoms of spring, the roses of summer and the leaves of autumn, for the adornment of the winter's fireside?

Sociability leads to friendship, but I'll not undertake to define what friendship is; it is enough to say, what would we be without it. I was particularly impressed with Mr. J. D. Reid's remarks at our spring meeting, and as he dwelt on the value of kind words, I drifted, as it were, to lines that are familiar to us all:

"A word in kindness sometimes spoken,  
Will heal the heart when nearly broken."

Those who are sociable are always friendly, and those who are friendly are generally kind, and the secret that prompted the organization of this Club was that we might all be friendly with one another. Without spring there would be no life; without summer there would be no bloom; without autumn there would be no tinge; without winter there would be no crystals. Let us blend the seasons as the Magnetic Club has blended them, and in the springtime we will find what may be called the blossoms of companionship, that in the summer will bloom into sociability and friendship, to tinge in the autumn our thoughts with gladness, that the crystal gems of thought may glisten by the winter's firelight.

The Magnetic Club is a subject for a poet. Sociability is its one and only object, and keeping that ever in mind there will be rays of light and cheer that will lead to all the pleasures and joys of life.

Humorous recitations by Mr. Ballantyne and a song by Mr. McAneeny were well received. Toasts to the ladies and the boys were shortened by J. B. Taltavall, T. P. Scully and W. H. Baker, owing to the lateness of the hour.

The return trip was made pleasant in various ways. Among those present were:  
Messrs. C. P. Bruch, W. L. Ives, Wm. J. Dealy, F. H.

Nicholls, T. P. Scully, T. Brennan, J. B. Bertholf, H. W. Barbour, W. L. Brant, Jas. A. Caw, W. L. Apgar, R. Murphy, John F. Coleman, John Coleman, Wm. Weis, Wm. H. Baker, Edw. B. Bruch, M. O. Hoffman, A. Biermann, L. S. Jones, G. E. Holbrook, T. A. Brooks, Geo. F. Fagan, J. B. Taltavall, P. J. Wicks, D. Wark, Thomas R. Betzel, R. C. McDonald, Wm. F. Lewis, T. Ballantyne, E. H. Lane, M. J. Dixon, J. W. Doyle, T. B. Fullon, W. W. Walsh, F. P. Clark, J. R. Heidemark, J. J. Weir, James P. Cullen, Sid. H. Flagler, T. J. Kinsella, Frank J. Kihm, A. John L. Morgan, Edw. T. White, Jas. T. McMahon, Chas. S. Pike, Gisborne Ward, Charles L. Chase, T. J. Smith, A. E. Harris, W. E. Winslow, Manuel A. Vaslier (chief of telegraphs of the West Railway in Cuba). Mr. and Mrs. H. C. Lockwood, Mr. and Mrs. G. W. Roberts, Mr. and Mrs. Edwin Dean, Mr. and Mrs. J. M. Moffatt and Miss L. Spear, Mr. and Mrs. D. W. McAneeny, Mr. and Mrs. Jos. Knittle, Mr. and Mrs. A. F. Louer, Mr. and Mrs. E. E. Brannin, Mr. and Mrs. A. J. Driver, Mr. and Mrs. F. O. Nourse, Mr. and Mrs. R. G. Stephenson and Miss S. S. Stephenson, Mr. and Mrs. B. F. Bunce, Mr. and Mrs. Chas. E. Orr, Mr. and Mrs. F. C. Halstead, Mr. and Mrs. W. R. Shaw and Mrs. Willets, Mr. and Mrs. J. McParlan, Mr. and Mrs. T. T. Dennis, Mr. and Mrs. W. H. Jackson, Mr. and Mrs. J. C. Watts, Mr. and Mrs. Paul Sheehan and Miss Lucy O'Rourke, Mr. and Mrs. J. E. Stark, Mr. and Mrs. E. F. Cummings, Miss J. M. Cummings and Miss K. E. Cummings, Mr. and Mrs. W. J. Morrison and Miss Annie Morrison, Mrs. E. Cranmer, Miss M. F. Cranmer and Miss Ella W. Stone, Mr. and Mrs. J. P. Clolery, Mr. and Mrs. J. F. Buxton, Mr. and Mrs. Willis H. Jones and daughters (Miss Effie, Miss Mabel and Miss Grace); Mr. Charles J. Power and Mrs. William Weeks, Mr. Gardner Irving and Mrs. Ada Breck, Mr. A. F. Hurd and Miss K. M. Drake, Mr. G. A. Newton and Miss Jennie Murphy, Mr. C. B. Rittenhouse and Miss Nellie Swords, Mr. Frank T. Fitch and Miss Jennie A. Fitch, Mr. J. P. Seely and Miss Ida E. Dealing, Mr. T. W. Palmer and Miss Estella T. Hearne, Mr. John Brant, Miss Lena J. Allen and Miss A. Douglas, Mr. W. H. Moffett and Miss M. A. Roome, Mr. H. A. Moody and Miss A. G. Nolan, Mr. J. C. Van Cura and Miss Josie Miller, Mr. L. F. Dowling and Miss L. E. Dowling, Mr. Morgan Jones and Miss May Finley, Mr. J. McKenzie and Miss M. McKenzie; Minnie Fones.

The advertisement of the Rogers Manifold and Carbon Paper Company, successors to L. H. Rogers, No. 75 Maiden Lane, which appears in this issue, is an extensive affair and requires little explanation. This establishment is one of the oldest manifold and carbon paper houses in this country, and orders for any quantity of goods will be filled accurately and promptly. The type-writer supply department, together with the manifold and carbon paper branch of the business is developing into extensive proportions, keeping pace with the rapidly growing demand for articles in these lines of trade. Their business is not confined to the metropolis alone but extends the world over. Almost every city in the United States is in communication with this house, looking to purchases, which is certainly a deserving compliment to the sagacious management of this enterprising supply establishment.

Mr. C. L. Buckingham, the well-known patent lawyer of the Western Union Telegraph Co., New York, while en route from Cincinnati, last week, was taken for John L. Sullivan, the prize-fighter, and accorded a tumultuous reception at every station between these two points, much to his annoyance. His declaration that he was not the famous John L. was met with "Rats!" "What are you giving us?" "Come off!" "Get on to the size of his right!" "Aint he a dandy!" etc., etc.



## CENTRE GAUGE AND GAUGE FOR GRINDING AND SETTING SCREW TOOLS.

WITH TABLE FOR DETERMINING THE SIZE OF TAP DRILLS.

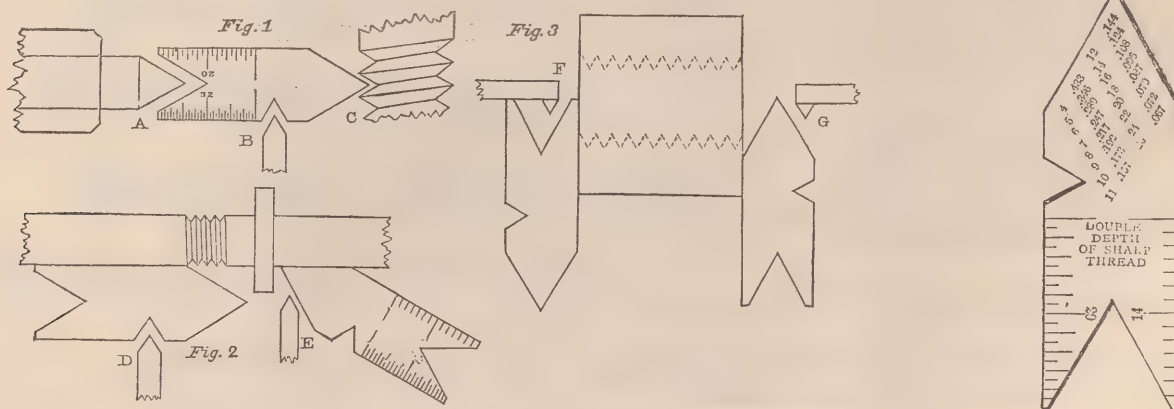
The angles used in this gauge are sixty degrees. The four divisions upon the gauge of 14, 20, 24 and 32 parts to the inch are very useful in measuring the number of threads to the inch of taps and screws. The following parts to the inch can be determined by them, viz: 2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 16, 20, 24, 28 and 32.

The following cuts show some of the numerous uses to which this gauge can be applied.

In Fig. 1, at A, is shown the manner of gauging the angle to which a lathe centre should be turned, at B, the angle to which a screw thread cutting tool should be ground, and at C, the correctness of the angle of a screw thread already cut.

Darling, Brown & Sharpe, Providence, R. I., are the manufacturers, and will gladly furnish these gauges at 25 cents each.

Mr. Schuyler S. Wheeler, the well known electrical expert of the Board of Electrical Control of New York, is the author of an excellent article on "Electric Lighting in New York." The article is profusely illustrated and



CENTRE GAUGE AND GAUGE FOR GRINDING AND SETTING SCREW TOOLS.

occupies about ten pages of *Harpers' Weekly* of July 27. The illustrations show how cables are drawn into the underground duct, a terminal pole with wires connected in subway, making a house connection underground, disorderly wires on lower Broadway, the electric light on Grand street, electric light street connection from underground, the dynamo room of a central station, engine room of a central station, electric light wires leaving a central station, and a score of other interesting illustrations. Mr. Wheeler has covered the entire subject of electric lighting in a manner which reflects the greatest possible credit on the author.

Mr. Samuel Insull, general manager of the United Edison Manufacturing Company, is only thirty years of age, but the great responsibility rests lightly on his young shoulders. His trust includes the management of Bergmann & Co's. extensive factory, the Edison Lamp Co., and the Edison Machine Works. He is also president of the Canadian Edison Manufacturing Co., treasurer of the Edison Ore Mill Co., and holds a number of other important positions. We have been unable to secure a photograph of Mr. Insull, which alone prevents us from presenting that gentleman's features to our readers.

Col. F. K. Hain, general manager of the Manhattan Elevated Railroad Company, has accepted the presidency of the Julien Electric Traction Company.

## ELECTRICAL PATENTS GRANTED JULY 8, 1889.

406,406. Telegraph pole; Charles M. Russell, Bowling Green, Ky., assignor of one-third to Thomas P. Lyne, same place.

406,421. Electric railway circuit; Josiah L. Blackwell, New York, N. Y.

406,489. Telegraph key; Henry A. Waldo, Reno, Nev.

406,492. Armature winding for dynamos; Jas. J. Wood, Brooklyn, N. Y.

406,567. Telephone. 405,568. Phonograph. 406,569. Phonogram blank. 406,570. Phonograph. 406,571. Process of treating Phonogram blanks.

406,600. Electric railway motor; Frank J. Sprague, New York, N. Y., assignor to Sprague Electric Railway Company, same place.

406,743. Electric railway; Walter H. Knight, New York, N. Y.

406,824. 406,825. Electric meter; Thomas A. Edison, Menlo Park, N. J., assignor to Edison Electric Light Company, New York, N. Y.

406,833. Means for propelling vehicles by secondary batteries; William W. Griscom, Haverford College, Pa.

## GRANTED JULY 16, 1889.

406,890. Electric heating apparatus for railway systems; Mark W. Dewey, Syracuse, N. Y., assignor to the Dewey Corporation, same place.

406,917. Electric track sweeper; Walter H. Knight, New York, N. Y.

406,968. Dynamo-electric machine; Nikola Tesla, New York, N. Y., assignor of two-thirds to Charles F. Peck, Englewood, N. J., and Alfred S. Brown, New York, N. Y.

406,969. Secondary battery; Charles H. Thompson, Detroit, Mich., assignor to the Woodward Electrical Company, same place.

406,982. Automatic telegraph; Frank Anderson, Peekskill, N. Y.

406,997. Galvanic battery; Patrick B. Delany, New York, N. Y.

407,101. Signaling apparatus; George F. Milliken, Boston, assignor of one-half to Albert P. Sawyer, Newburyport, Mass.

407,188. Electric railway; Stephen D. Field, New York, N. Y., assignor to David Dudley Field, trustee, and Stephen J. Field, Cyrus W. Field, Henry M. Field and Stephen D. Field.

The Postal Telegraph Co. will put down in the streets of New York \$100,000 worth of underground wires very shortly.

75 Maiden Lane, N. Y.

ESTABLISHED BY L. H. ROGERS, 1869.

# Rogers' Manifold and Carbon Paper Co.,

(Incorporated under the laws of the State of New York.)

MANUFACTURERS FOR THE TRADE.

Manifold Paper, Typewriter Paper, Manifold Books, Duplicating Books, Typewriter Ribbons and Carbons, Carbon Paper (all kinds), Stylus, Etc., Etc.

## MANIFOLD BOOKS.

Best Quality. Especially adapted for Manifold Writing and Duplicating Books. 96 Leaves in each Book.

### YELLOW, WHITE OR MANILA.

No.	Size.	Weight per Ream, 20x30.	Per Book.	Per Package.
130	5x7	4 to 4 1/2 lb.	\$0 04	40 book, \$1 60
131	5x8	"	05	20 " 1 00
132	5x10	"	06	20 " 1 20
133	7x10	"	08	20 " 1 60
134	8x12	"	12	20 " 2 40
135	8x13	" (type-writer)	14	20 " 2 80
136	10x15	"	16	20 " 3 20
137	10x15	7 lb.	16	20 " 3 20
138	10x15	4 1/2 to 10 lb. (ruled)	50	10 " 5 00
139	10x15	10 lb.	16	20 " 3 20

No extra charge for cutting the above sizes to suit. Manifold books made to order at the lowest rates, plain or printed.

## WHITE OR YELLOW MANIFOLD PAPER.

Best Quality. Especially adapted for Manifold Writing and Duplicating Books.

No.	Size.	Weight per Ream, 20x30.	Per Quire.	Per Ream
100	17x25	4 lbs.	\$0 15	\$3 00
101	20x30	4 "	15	3 00
102	20x30	4 1/2 lb.	15	3 00
103	20x30	7 "	15	3 00
104	20x30	10 "	15	3 00
105	24x36	7 "	20	4 40
106	15x20	4 1/2 to 10 lbs. (ruled)	12	2 40
107	24x36	4 1/2 lbs.	20	4 00
108	20x30	6, 9 and 12 lbs., white glazed	20	4 00

## MANILA MANIFOLD PAPER.

No.	Size.	Weight per Ream.	Per Quire.	Per Ream
120	20x30	10 lbs.	\$0 15	\$3 00

Orders in quantities for Manifold Books or Paper, special price given on application. Manifold outfit by mail, 50 cents.

## CARBON PAPER.

Best Quality. Especially adapted for Manifold Writing and Duplicating Books.

### MOIST, CLEAN, OR DRY, ON THIN OR THICK PAPER.

No.	Size.	FULL.		SEMI.	
		Per Doz.	Per 100.	Per Doz.	Per 100.
25	3x5	\$0 03	\$0 25	\$0 03	\$0 25
26	5x7	06	50	06	50
27	5x8	08	60	08	60
28	5x10	08	60	08	60
29	6x8	08	60	08	60
30	7x10	12	1 00	12	1 00
31	8x10	16	1 20	16	1 20
32	8x12	16	1 20	16	1 20
33	10x12	20	1 60	20	1 60
34	10x15	25	1 75	25	1 75
35	15x20	50	3 50	50	3 50
36	18x24	60	4 75	60	4 75
37	20x30	75	6 00	75	6 00

When ordering, mention size and kind desired. When in colors, double rates. Special Prices for Carbon Paper by the ream, 480 sheets, sizes, 18x24, 20x20, 20x24, 20x28, 20x30, 20x36. All kinds and sizes made to order in reams or rolls.

## No. 1 TYPE-WRITER CARBON PAPER.

No.	Size.	FULL.		SEMI.	
		Per Doz.	Per 100.	Per Doz.	Per 100.
70	8x10	\$0 40	\$2 75	\$0 40	\$2 75
71	8x11	40	2 75	40	2 75
72	8x12	40	2 75	40	2 75
73	8x13	40	2 75	40	2 75
74	8x14	40	2 75	40	2 75

No. 2 T. W. Carbons, above sizes, \$0.25 per doz. \$2.00 per 100, full or semi. Quality unexcelled. Sample dozen sent by mail on the receipt of the price. Blue, purple and green carbons same price.

## TYPE-WRITER RIBBONS.

### REMINGTON, CALIGRAPH AND HAMMOND.

Superior Quality, Warranted Full Length.

No.	Each.	Per Doz.	No.	Each.	Per Doz.
1	Black Copying Blue	\$1 00 \$9 00	20	Black Record	\$1 00 \$9 00
2	" Purple	1 00 9 00	21	Purple "	1 00 9 00
3	" Green	1 00 9 00	22	Green "	1 00 9 00
4	Purple	1 00 9 00	23	Blue "	1 00 9 00
5	Green	1 00 9 00	24	Red "	1 00 9 00
6	Blue	1 00 9 00	25	Brown "	1 00 9 00
7	Red	1 00 9 00	26	Hektograph	1 00 9 00
8	Lithograph	1 00 9 00	27	Duplicator	1 75

All Caligraph Ribbons are \$0.75 each, and \$7.00 per doz. Sample books, carbons, or ribbons sent by mail on receipt of the price.

## STYLUS.

Especially adapted for Manifold Writing and Duplicating Books.

### BONE STYLUS.

No.	Each.	Per Doz.	Per Gross.
1	Swell Handles	\$0 10	\$1 00
2	Straight	10	1 00

### PORCELAIN STYLUS.

3	Swell Handles	\$0 10	\$1 00
4	Straight	10	1 00

### AGATE STYLUS.

5	Swell Handles	\$0 25	\$2 50	\$28 00
6	Straight	25	2 50	28 00
7	Ebony " Small	40	4 80	
8	" " Medium	60	7 20	
9	" " Large	75	9 00	
10	" " Extra Large	1 00	12 00	
11	" " Screw Top	75	9 00	
12	" " Engraved Ferrules	1 00	12 00	
13	" " " "	2 00		
14	Pearl " " "	3 00		
15	" " " "	25	2 50	
16	Pocket Stylus, Cap Ends	40	4 80	
17	" " " " Fancy	6 50		
18	Show Window Sign	1 50		
19	All Agate. Large	2 00		
20	" " Extra Large			

### STEEL STYLUS.

25	Ebony Handles	\$0 25	\$2 50	\$28 00
26	Swell	15	1 50	16 00
27	Straight	15	1 50	16 00
28	Swell	10	1 00	10 00
29	Straight	10	1 00	10 00

## DIRECTIONS FOR ORDERING STYLUS.

**Bone Stylus.**—Nos. 1 and 2 have the best Cedar handles, red or black, with nickel-plated ferrules.

**Porcelain Stylus.**—Nos. 3 and 4 have the best Cedar handles, red or black, with nickel-plated ferrules.

**Agate Stylus.**—Nos. 5 and 6 have the best Cedar handles, red or black, with nickel-plated ferrules.

Nos. 7, 8, 9 and 10 selected Agate points, all shades of color, small, medium, large and extra large size, with roll gold or nickel-plated ferrules, Ebony handles, made to stand hard usage, very desirable for manifolding and in large demand.

No. 11 designed for operators who prefer to protect the Agate point with a cap or covering when not in use or carrying in the pocket. Neat in appearance, nickel-plated, medium size, Ebony handles.

Nos. 12 and 13 are medium and large size Agate points, with roll gold ferrules, beautifully engraved, Ebony handles, the finest made.

Nos. 14 and 15, selected Pearl handles, with roll gold ferrules, beautifully engraved, fine Agate point, put up in gold pen case, suitable for ladies' use, and will make a handsome present, medium and large sizes.

Nos. 16 and 17 Pocket Stylus, nickel-plated cases, cap ends for pencil and Agate points.

No. 18 Show Window Sign, 15 inches long; handles 1 1/4 inch diameter, Agate point, weighs one-half pound.

Nos. 19 and 20 are specially manufactured for us as a novelty; they are all one piece of agate, both handle and point, and are beautiful specimens both in colors and polish; same in size as Nos. 9 and 11.

**Steel Stylus.**—No. 25 extra quality steel stylus (Patented 1880) nickel-plated, and will not break, rust or tarnish, Ebony handles, the best made. Desirable for railroad and telegraph use.

Nos. 26 and 27 have the best Cedar handles, red and black, with nickel-plated ferrules.

Nos. 28 and 29 have Cedar handles, red, white or black, with no ferrules. The Ebony handles are a new design, substantially made, and will not tear the pockets if carried in them. Notice on cuts Nos. 7 to 13.

All orders for Ebony handle Agate Stylus by the dozen, one kind or assorted, will be packed in a neat show box.

Manufacturing on the premises and carrying a large stock, can fill orders promptly. Stylus repaired or re-pointed, 25 cents each. Stylus made to order.

Sample stylus sent by mail on receipt of the price.

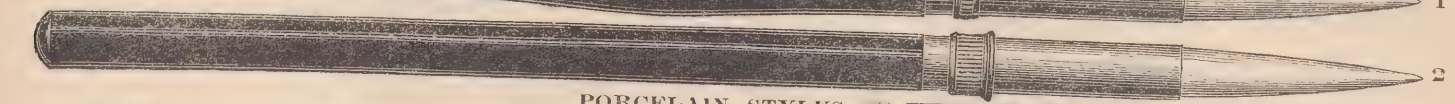
ROGERS MANIFOLD AND CARBON PAPER CO.,  
BONE STYLUS.

No. 75 Maiden Lane, New York.

No



1

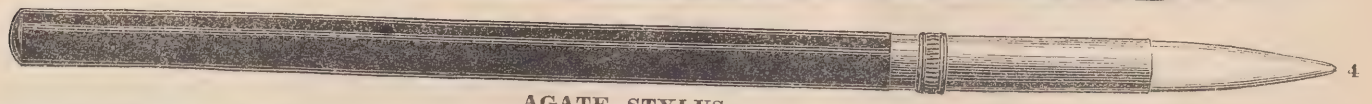


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PORCELAIN STYLUS.



3



4

AGATE STYLUS.



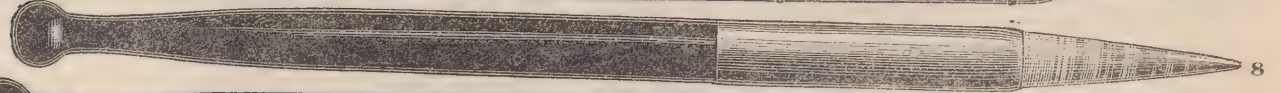
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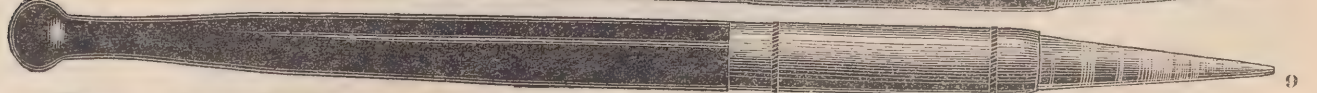
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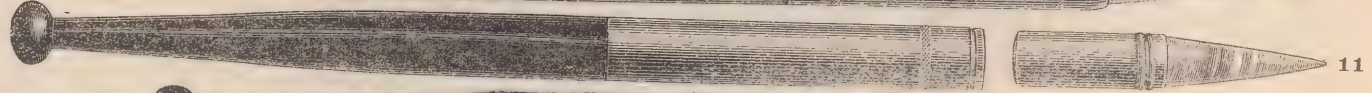
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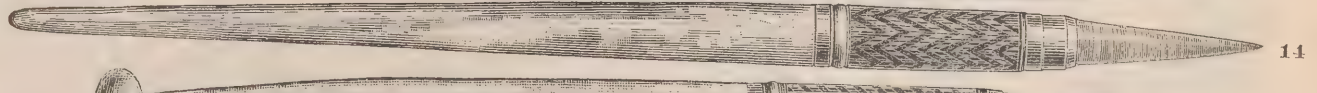
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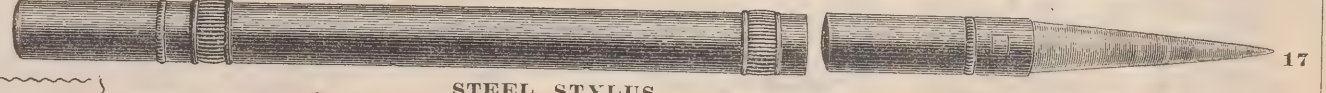
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STEEL STYLUS.



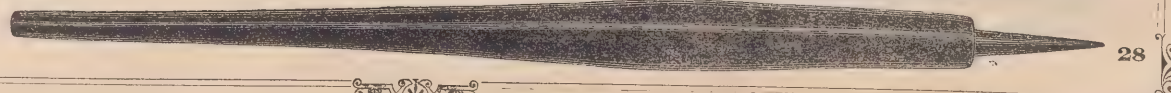
25



26



27



28

SPECIALTIES.

- Manifold Books.
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- " Letter Writers.
- " Train Order Books.
- " Copying Books.
- Carbon Paper.
- Semi-Carbon Paper.
- Colored Carbon Paper.
- Semi-Colored Carbon Paper.
- Type-Writer Paper.
- Type-Writer Carbon Paper.
- Clean Edge Carbon Paper.
- Artist Transfer Carbon Paper.
- Stylus, all kinds.
- Type-Writer Supplies, &c.

THE  
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book is deserving of success, and we predict for it a splendid sale."—*The Age of Steel.*

"\* \* \* A book like this, should be largely read. Mr. Meadowcroft's volume is short, simple and well illustrated \* \* \* It also explains electrical terms more clearly than most of the dictionaries."—*N. Y. Herald.*

"It is a capital book, and contains within a hundred pages, and in simple and intelligible terms, a vast amount of useful information nowhere else accessible in such a form, concerning the telegraph, the telephone and various other electrical appliances, which, although of every-day use, the great majority of people know little about."—*Washington Post.*

"An instructive little book, whose purpose is amply 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.*

108 PAGES, ILLUSTRATED, LIMP CLOTH. WILL BE MAILED BY US FOR 50 CENTS.

**FRANK F. LOVELL & CO., Publishers,** 142 & 144 Worth Street, New York.

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**THE VALUABLE BOOK ON**

**STEAM**

**THE BABCOCK & WILCOX COMPANY, NEW YORK AND GLASGOW.**

**FREE ON APPLICATION**

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 MELBOURNE, AUSTRALIA

## THE ELECTRIC AGE.

### THE GRADY ELECTRIC ALARM CLOCK.

Mr. Thomas H. Grady, of 195 Broadway, New York, is the inventor of an electric alarm clock which is worth more than a passing notice, an excellent field for its use being apparent.

On an ordinary metal clock an extra hand travels with the hour-hand and forms an electrical circuit at the time it is desired the alarm should sound. An ordinary electric magnet is placed within the clock, one of its wires extending out of the back of the clock and terminating with a metal plug.

The clock is provided with the customary works and hands, and in addition the supplemental hand which has upon its inner side a sleeve, encircling the usual post, the said hand being directly below and travelling with the hour-hand of the

clock. To the frame supporting the clock mechanism are secured the electro-magnets and contact post, the latter being connected by wire with one leg of the clock, the wire being suitably provided with insulating material in order that its contact with the frame may not disturb the electric current. On a bracket, and insulated therefrom, is secured the spring to which is attached the armature, which forms the support for the hammer.

The normal position of the spring is against the inner end of the adjustable screw which passes through the post above referred to, the armature being thus held from contact with the cores of the electro-magnets by the tension of the spring. The electro-magnets are connected by a conducting-wire with the spring and by the conductor with the metallic plug or post.

The dial is made of non-conducting material—such as hard rubber or celluloid—and upon its face is applied a paper disk, upon which the customary numerals are printed. The dial contains a line of apertures, encircling the series of numerals and in position to be traversed by the supplemental hand. The glass face is held in the recesses at the outer edges of the clock-casing, and is revolvable at will.

In the glass face is provided an aperture which is in a position to be moved over any one of the apertures in the dial.

In the use of the invention the person setting the alarm will insert the end of the plug in the aperture and revolve the glass face to such position as will enable him to move the plug into the aperture adjacent to the hour at which he desires the alarm to sound. The plug being in use, the supplemental hand will at the hour come into contact with the same and complete the electric circuit. It is obvious that the ringing of the bell will continue until the person arises and withdraws the plug from the clock face. The clock rests on a small box containing a dry battery, and is therefore always ready for use without any wiring.

Mr. Grady will be pleased to furnish any information concerning his invention to those interested in the same.



# PHOTO TYPE CO.,

76 BEEKMAN ST.

New York.

PRINTING PLATES ON BRASS

Direct from Photograph, Painting, Drawing, &c., by Oesterreicher's New Process.



### O. R. T. DATING OUTFITS!

Put up especially for Operators, contains

- 1 Self-Inking Stamp, (your name)
- 1 Self-Inking Stamp, (town and state)
- 1 Self-Inking Date Holder,
- 1 Set Solid Rubber Dates, (good 8 years)
- 2 Bottles Ink, (any color).

Sent postpaid, only \$1.85.

### SOLID RUBBER MOVABLE TYPE!

Is needed by all; 4 sizes, 50 cts. to \$2.00.

- Name, and all small one line Stamps, - - - 20 cts
- Pen and Pencil Stamps and Ink, - - - 25 "
- Little Gem, Self-Inking, (one line) - - - 45 "

Everything Else in Proportion. Agents Wanted.  
—Circulars Free; 16 page Catalogue 2 ct. Stamp.—

B B. WELDY, Opr. C. B & N. Ry., Beef Slough, Wis.

### FOR SALE.

Fifty-light Edison Incandescent Electric Light Plant, almost new, with 20 horse-power engine, 30 horse-power boiler.

Fifty-light Edison Dynamo, with Lamps, Sockets, Indicator and Hand Regulator. Price extremely low for cash.

For full particulars, address

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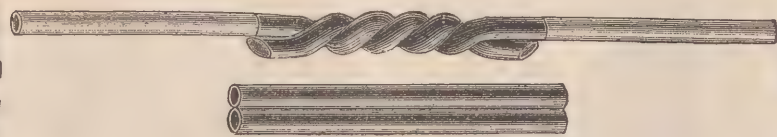
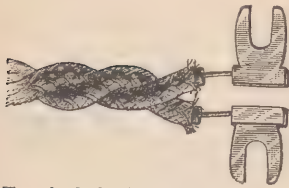
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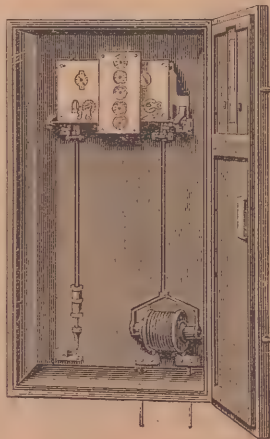
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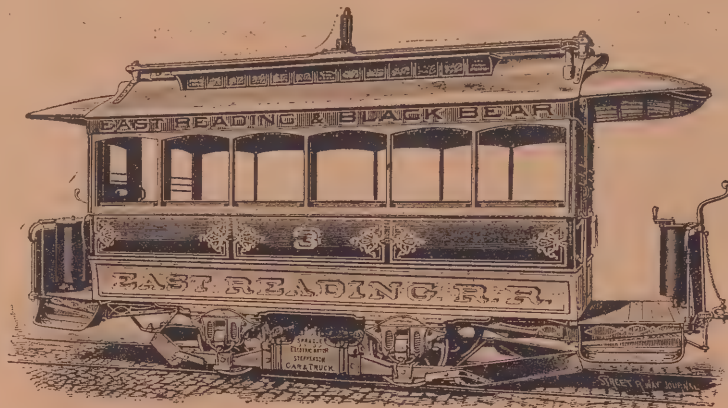
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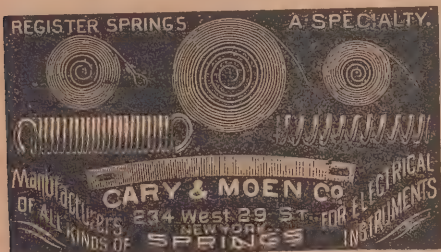
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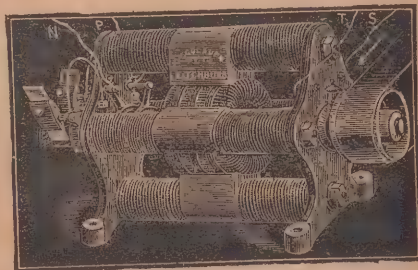
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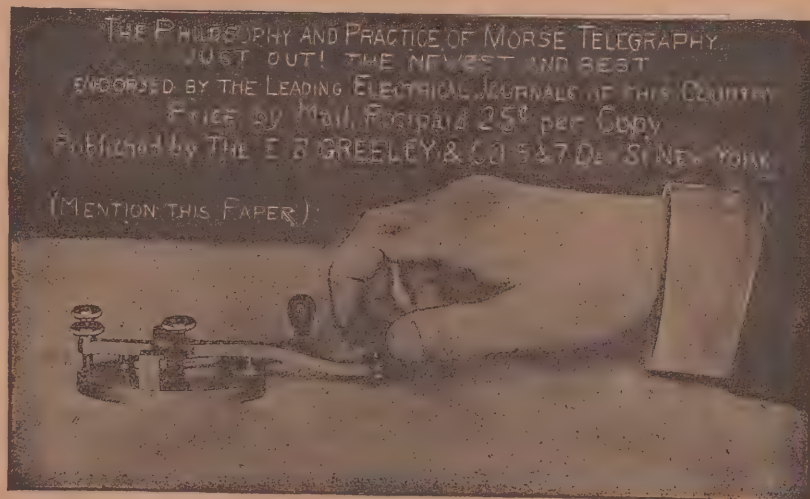
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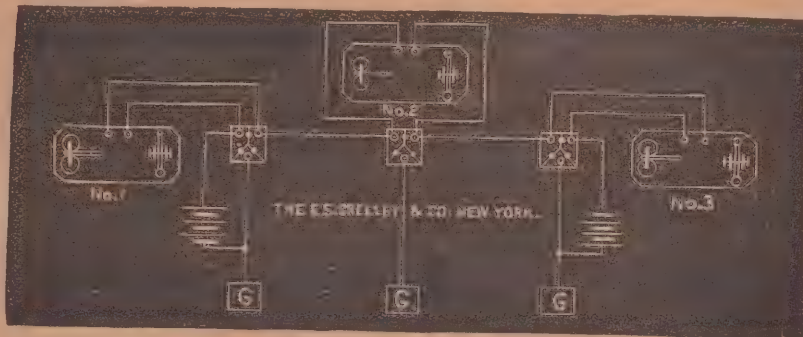


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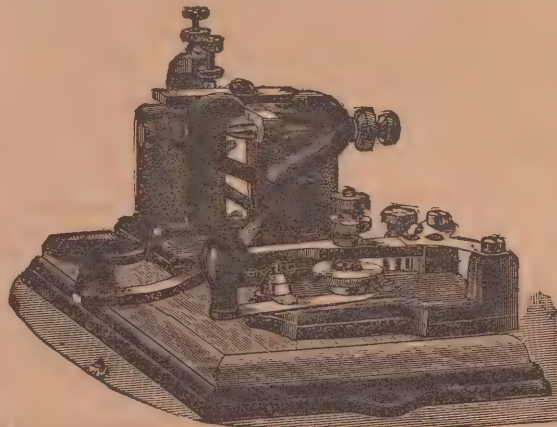
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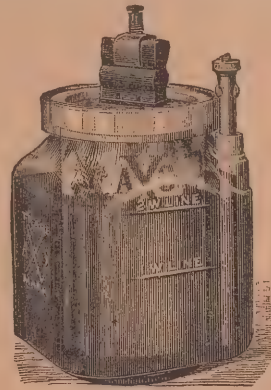
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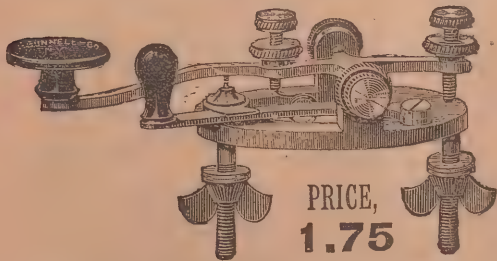
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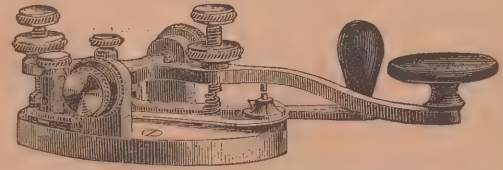


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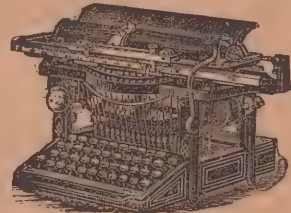
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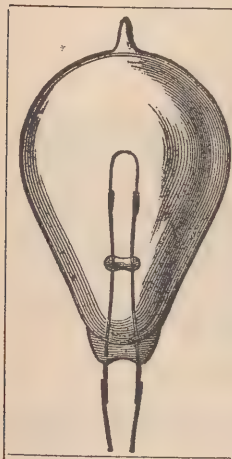
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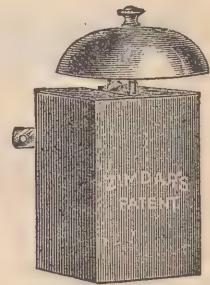
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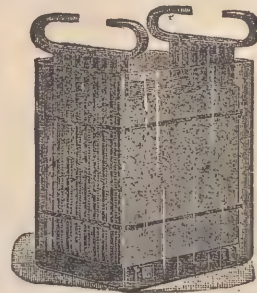
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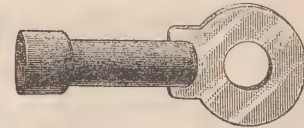
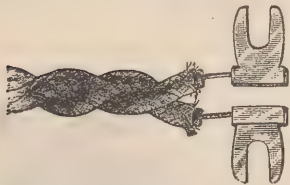
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JOHN W. MACKAY.

(From the San Francisco Daily Report.)

The most popular millionaire in the United States is John W. Mackay. He presents the rare spectacle of a very rich man who has for many years past been engaged in vast enterprises, involving the handling of hundreds of millions of dollars and directly or indirectly concerning many thousand individuals of all sorts and classes, and who is yet without an enemy in the world. He has business rivals, of course, but no enemies. When he sat down at table yesterday, in New York, with a crowd of employes around him to hear their compliments and good wishes and to receive a tangible token of their friendship and that of his numerous employes engaged in the telegraph enterprises throughout the United States, he was surrounded by personal friends, and the ticking of instruments announcing the event in Postal Telegraph offices north, west and south, and away across the ocean too, by the way, was listened to by personal friends in every instance.

It is a pleasure to the *Report* to note this fact, and should be a pleasure for every newspaper in the country to note it. Such an *entente cordiale* between employer and employes might exist in every instance, and should in this country. It would, if the acquisition of wealth did not make so many men purse-proud, and cause them to forget the fact that American citizenship recognizes no such distinctions and that in America a man's a man for a' that.

John W. Mackay is no different in his manner, no different in his intercourse with his fellow citizens; as approachable, as unassuming, in every way as good an American citizen now that he is one of the richest men on earth as he was when he swung a pick in the lower levels of a Comstock mine. Greatly to his credit is this. It shows that his heart, like his fortune, is of solid silver. The difference between him and most of his fellow millionaires is due to his simple, straightforward manliness and kindly heart. They are qualities that have remained unimpaired in all the vicissitudes of his life and have shown themselves in all his acts, great and small. They have had much to do with his success, for they have always commanded him good and faithful service; and they should go far to make his life happy, for where neither money nor power fail to satisfy the human heart, the

respect, love and gratitude of one's fellow creatures go very far to fill the void, and, in fact, usually fill it. That John W. Mackay will live to enjoy what he has so well earned is the wish of the *Daily Report*.

We have received from F. W. Jones, assistant general manager and electrician of the Postal Telegraph Co., copies of photographs of A. B. Chandler, C. A. Tinker, D. H. Bates, J. H. Emerick and W. J. Bodell, the originals of which were taken in Washington during the war. They form an interesting group of army telegraphers. The most striking thing about them is the manner in which these distinguished gentlemen wore their trousers at that time. Those of Mr. Chandler appear to be about one yard in width. Those of Mr. Tinker and Bates run a close race at three-quarters of a yard. Messrs. Emerick and Bodell evidently thought of possible future criticism and confined their pictures to a face view only.

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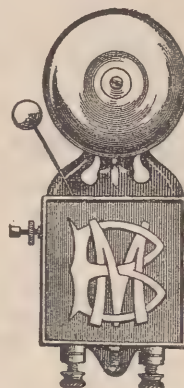
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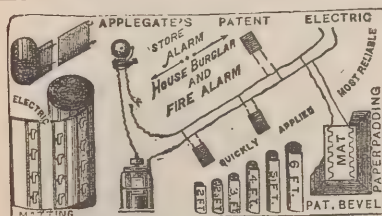
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C. S. LOEWENTHAL, 525 Milwaukee Avenue, Chicago.

NEW YORK, AUGUST 16, 1889.

## THE ELECTRIC LIGHT CONVENTION.

The interests of the electric light and power people are in good hands, but when in convention assembled the freest and fullest discussion should be permitted. President Weeks, no doubt, would have persuaded the convention to accept Kansas City as the next meeting place of the Association if he had not angered a majority of those present by his undignified method of choking off all discussion on the new constitution, which was declared unanimously adopted, when in fact a dozen members were prepared to offer important amendments.

The papers presented to the Association were able and carefully written and contained much valuable information.

Dr. Moses expressed the true sentiment of the electrical profession when he condemned the new law which provided for electrical executions in the State of New York. It is to be hoped he may persuade Governor Hill to take action looking to a repeal of the obnoxious statute.

The convention did well to select a committee to confer with Mayor Grant, of New York, on the question of having the electrical profession fully represented on the committee having in charge the World's Fair of 1892.

Aside from the manner in which it was brought about, no one will find fault with Kansas City, Mo., as the next meeting place.

On another page appears an article on machine telegraphy. The author, Mr. D. H. Craig, founded and controlled the Associated Press for the first twenty years of its existence and has made the subject of automatic telegraphy the study of his life. He is a firm believer in the ultimate success of his system. It certainly behooves all telegraph companies in these days when the present wire facilities cannot be relied upon for a great length of time, to possess a fast system which can be put into successful use at a moment's notice in times of emergencies. Indeed many believe a company can afford to use an automatic system even when the elements are most favorable to Morse circuits. Slow business might successfully be carried at all hours by such a system. The Western Union claim the Wheatstone system is a successful carrier of slow dispatches and has become a necessity in handling their rapidly increasing business. The final adoption of machine telegraphy depends

largely upon the increased demand on the part of the public for lower tolls. The elements are also a startling factor in its final adoption. The saving to a company would not be in the reduction of force, as many suppose—for the increase in the number of employes required to handle the increased business would be enormous—but in the wire facilities. For instance, one circuit to Chicago in times of serious wire trouble would be ample to exchange the important business of the entire Western States, whereas now all business suffers serious delay.

Everything is said to have its parasite, and the cable at the bottom of the sea is no exception. Cables have been taken up from a depth of a mile and a half with the hemp covering badly eaten away, and at a depth of over half a mile strong currents of the ocean have rasped the armored wires on the rocky bottom. Experience has not yet determined the full lasting qualities of electric cables. Specimens have been taken up which show no signs of deterioration after having been in the water for more than thirty-five years. Water, and especially salt water, seems to be a preserver of insulating compounds.

In another column will be found an advertisement of the Ozokerite Mining Company. Our readers are respectfully asked to send for a copy of their prospectus. Ozokerite is the great American insulating and waterproofing material. The production is far behind the demand and a rare opportunity awaits a prompt investor. Capital is wanted only for the purpose of increasing the output of the mine. Mr. J. Wallace, of 280 Broadway, New York, is the president of the company.

The substitution of some other power for horses for the propulsion of street cars is receiving the attention of most of the horse railroad companies in nearly all our large cities. The managers are becoming convinced that it is time to make a change, and the cable system and electricity in some form seem to be the powers which are receiving their consideration, and to some extent adoption.

Bourke Cochran, the well-known lawyer, went considerably out of his way the other day to make a statement, in a Buffalo court, that the electrical experts knew nothing about electricity. The electricians at Niagara Falls, the week following, did not forget to praise Mr. Cochran for the kindly interest he had taken in the Kemmler case.

It is announced that the Drawbaugh claims to the telephone are to be revised under the auspices or with the assistance of the United States government. It will be remembered, on the original hearing, the judges of the Supreme Court were divided in their opinion as to Drawbaugh's merits in the invention.

We are in receipt of a copy of the reproduction of the album presented to Mr. John W. Mackay, president of the Commercial Cable Company, as mentioned in our last issue. It is a beautiful piece of work and reflects unusual credit on the donors. Mr. George G. Ward has our hearty thanks for his kindly remembrance.

Mr. Ely, in his address of welcome to the Electric Light Convention, stated that Thomas A. Edison is authority for saying that Niagara is the greatest storage battery in the world. He added that Sir William Thomson, of England, claimed that in Niagara rested greater force than in all the coal fields of the world.

The eleventh annual clam bake of Mr. Eugene F. Phillips, president of the American Electrical Works, was given August 10, at Providence, R. I., and the usual twenty tons of clams were disposed of among the one hundred hungry electricians assembled.

Mr. John W. Mackay, president of the Commercial Cable Company, made a present of 1,100 copies of the last issue of the ELECTRIC AGE to his various managers throughout the world.

## THE LOOMIS ELECTRIC LIGHT SYSTEM.

The Loomis system of electric lighting, though comparatively new, has been long enough in operation to test the value of the various features peculiar to it, and it has received the

endorsement of many establishments in which it is in use. The field in which it is best known extends throughout the entire New England States and many of the Northern States as far west as Oregon and California.

One feature of the Loomis system is that the regulation of the dynamo is automatic; that is, that the dynamo "requires no more attention than a line of shafting." So long as the power is supplied and the bearings of the armature shaft properly lubricated, the required amount of current is given,

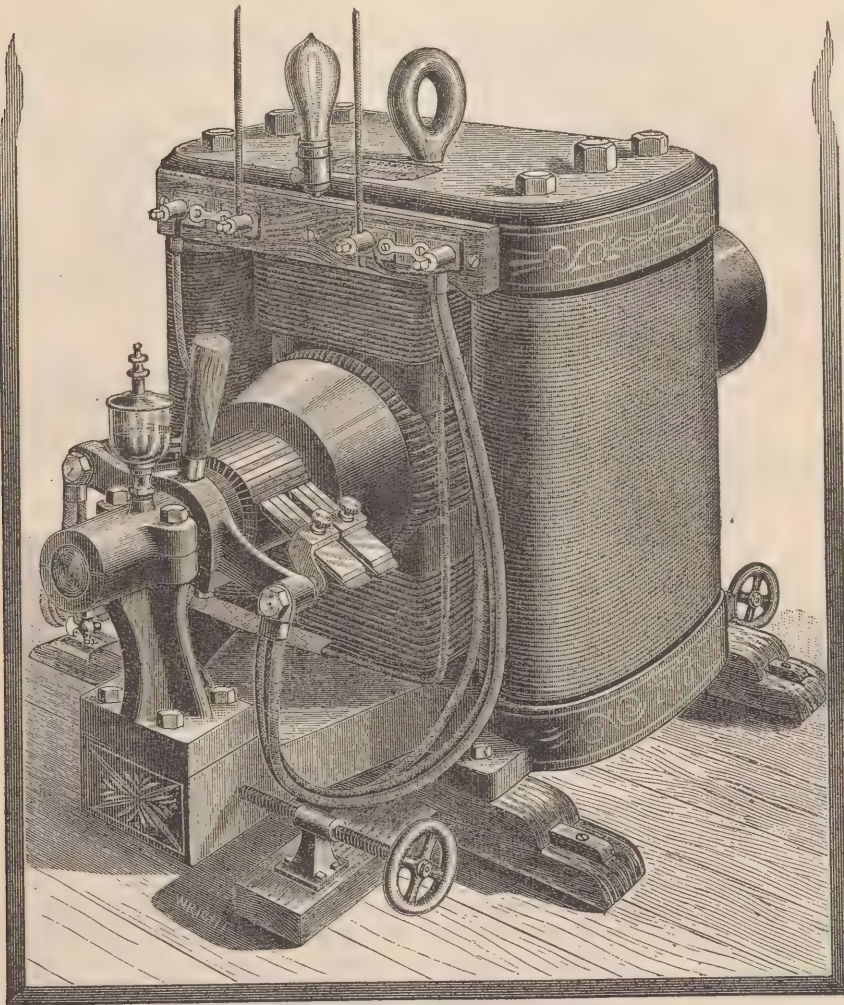


FIG. 1.—DYNAMO. LOOMIS SYSTEM.

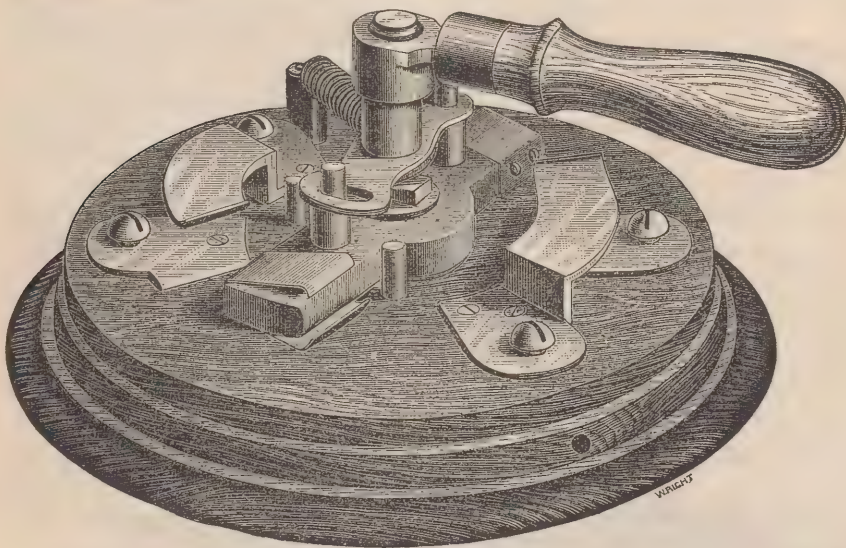


FIG. 3.—DOUBLE-POLE SWITCH. LOOMIS SYSTEM.

and no more, whether there be only one lamp in circuit or the maximum number for which the machine is intended. The quantity of current is diminished as the lamps are extinguished, and increased as they are lighted, without any atten-

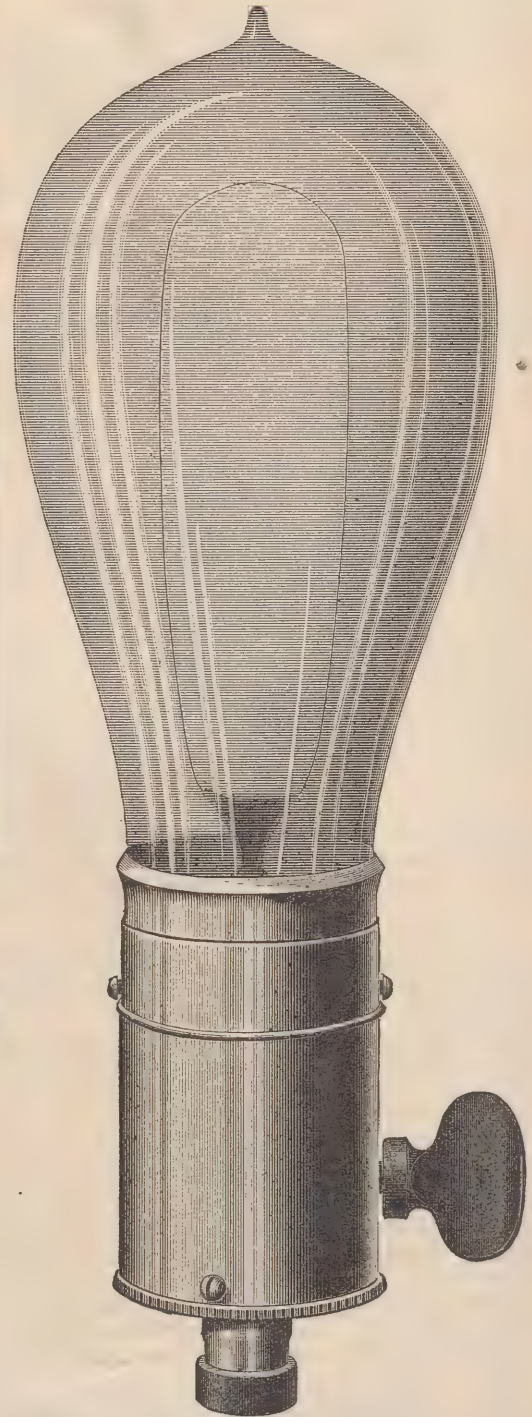


FIG. 2.—16-CANDLE-POWER INCANDESCENT LAMP AND SOCKET. LOOMIS SYSTEM.

tion being paid to the dynamo, and it is claimed that power absorbed by the dynamo is in proportion to the number of the lamps in actual use. The regulation of the dynamo so as to secure these results is accomplished by a simple method.

There is no shifting of the brushes required, nor is any resistance introduced into the circuit, so there is no attendant required to watch either the dynamo or the resistance box. Moreover no sparking at the brushes can be detected when the lights are turned on or off.

The self-regulation of the dynamo, which is not obtained by a waste of power in driving the current through resistance coils or in weakening the current by shifting the brushes from

The company maintains that the lamps are practically the only destructible parts of their system, and they guarantee them an average life of at least eight hundred hours. They have on record one case in which 42 lamps in an installation of 123 are always lighted whenever the dynamo is in operation. Of these 42, 34 were still in use after 2,162 hours' service. Of this same installation, which is in a paper-mill at Holyoke, Mass., the treasurer of the paper company says, "I find I can

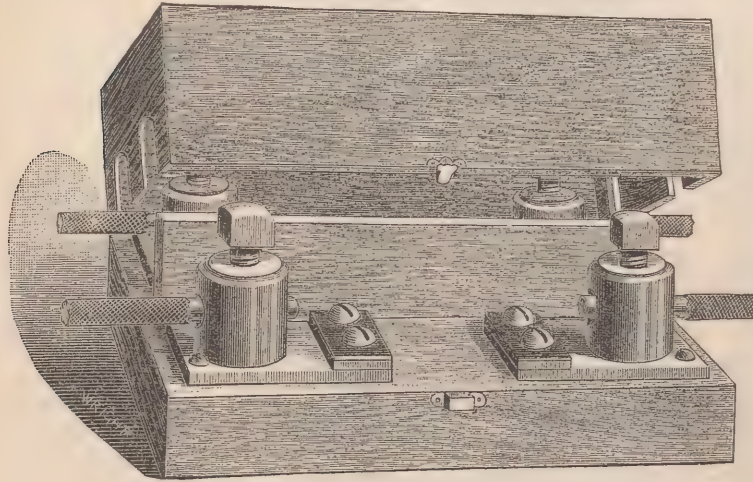


FIG. 4.—FUSIBLE CUT OUT. LOOMIS SYSTEM.

the point of greatest efficiency, enables the lamps to be kept up to their maximum of brilliancy at a minimum consumption of power, while it is believed that the steadiness of the current extends the life of the lamp to its utmost limit.

The main advantages claimed by this system may be summed up as follows: first, economy in cost of plant, owing to simplicity of construction of dynamo and accessories, and ease of installation; second, economy of maintenance, power

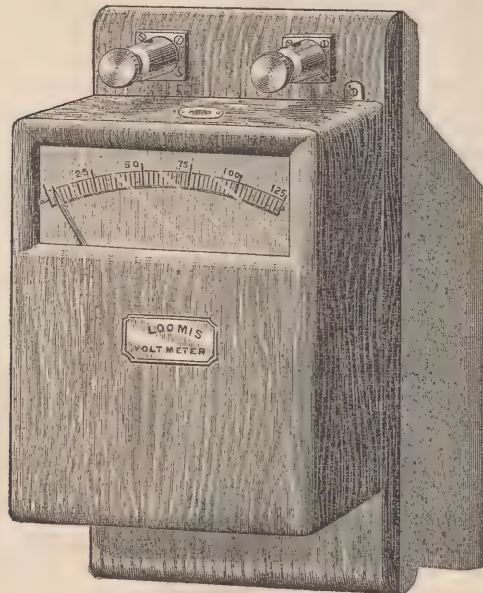


FIG. 5.—VOLTMETER. LOOMIS SYSTEM.

being used only in proportion to the amount of light furnished, and no extra attendant being required; third, exemption from the necessity of stoppage for repairs, as it is maintained that the armature cannot be burned out under any circumstances; fourth, the light is steady; fifth, owing to absence of variation in the intensity of current, the lamp lasts longer than in systems where such conditions do not prevail.

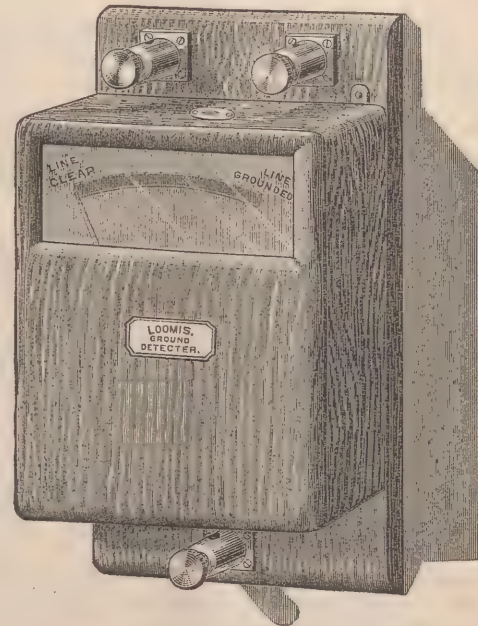


FIG. 6.—GROUND DETECTOR. LOOMIS SYSTEM.

cut out 122 of 123 lamps without increasing the brilliancy of the remaining one or causing any spark to form at the brushes."

Mr. F. M. Messenger, agent Grosvenor Dale Co., North Grosvenor Dale, Conn., says that they believe that in the Loomis system they have got all they could expect in their plant. "We could not find fault with it, if we desired to be captious," says Mr. Messenger.

The Loomis system is also in successful operation at Saccapappa, Maine, Leominster, Mass., Boston, Holyoke, Mass.; Brooklyn, Conn.; Little Falls, N. Y., Newburgh, N. Y.; Hazardville, Conn.; North Wilbraham, Mass.; North Andover, Mass.; Wakefield, Mass.; Amsterdam, N. Y.; Schenectady, N. Y.; Paterson, N. J.; Bloomfield, N. J.; Philadelphia, Pa., and many other cities adjacent to New York.

The Loomis dynamo is shown in Fig. 1, the lamp and socket in Fig. 2, the sockets being of such a design as to guard against liability to short-circuiting. Fig. 2 shows the actual size of a 16 candle-power lamp. Fig. 3 is a fusible cut-out. It has ample contact surfaces for the fuses, and consequently is not liable to give trouble by unnecessarily burning out. The switches, both double-pole and single pole, have large contact surfaces, and make the break instantaneously. The double-pole switch is shown in Fig. 4. This company furnishes ammeters, voltmeters, ground detectors, and other electrical appliances and safety apparatus required for incandescent plants. The voltmeter is shown in Fig. 5 and the ground detector in Fig. 6. At an early date they will have ready a motor embodying the same general features as their dynamo.

The main office of the Loomis Electric Manufacturing Co. is located at 18 Broadway, N. Y.

E. H. Botts, a young electrician, of New York, fell down stairs a few days ago and broke his neck.

## NOTES AND EXHIBITS.

The Eddy Electric Manufacturing Co., of Windsor, Conn., was ably represented by M. E. Baird.

The Standard Carbon Co., of Cleveland, O., was fully represented by its popular vice-president, M. J. B. Crouse.

J. P. McQuade, representing the National Underground Conduit Co., was on hand and was well received by everyone.

The Standard Underground Cable Co., Pittsburgh, were well represented by Mr. Fred. Degenhardt, of Chicago. Their genial secretary, Mr. Marsh, was also on hand.

The Okonite Wire Company, of everywhere, including New York, Chicago, Boston, and all other cities, was ably represented by Captain Willard L. Candee and George Manson.

Mr. F. E. Pettingell, of Boston, was disappointed by his samples being delayed. This robbed the convention of a handsome exhibit, which was latterly shown in the International Hotel.

Mr. A. Barthman, representing C. Hackenthal, sole agent for Prof. Aron's Electric Counter was on hand, and his description of this fine machine was very satisfactory and fully appreciated.

The exhibit of the Ellis Lubricating Company, of Boston, was well represented by Mr. O. Holbrook, who advocated the benefits of the various sizes of cylinder and air compressor oil cups.

The two sixteen-inch belts on the Brush plant in the local station were from the American Leather Link Belt Co., and gave first-class satisfaction. Mr. G. H. Fisher represented the Belt Company.

Mr. Benjamin R. Western, of the well-known Manufacturers' Advertising Bureau, of New York, accompanied by his business manager, Mr. J. H. Williamson, were prominent figures at the convention.

The Bishop Gutta Percha Wire Co. was well represented by Mr. H. A. Reed, who had a pocket full of fine samples and a head full of common sense. He was heard from previous to the close of the convention.

A. R. Botsford, representing the Non-magnetic Watch Company of America, had the finest display consisting of watches, ranging in prices from \$20 to \$1,200, from a silver case to a diamond set gold case.

C. D. Smith, representative of the National Carbon Co., of Cleveland, gave to all a copy of their new directory of arc light companies. W. C. Hayes, the treasurer, and President Benjamin F. Miles were on hand.

"If I don't get a berth in this car not a man shall sleep!" was what Mr. Latshaw, of New York, said coming home; and he kept his word up to 2 a.m. Dr. Moses can substantiate this. He got a berth at that hour.

The Munson Belting Company, of Chicago, was ably represented by J. H. Shay, whose presence was eagerly sought and rawhide canes were the order of the day. Mr. E. Gabel, also a representative of this firm from the "windy city," was on hand. He will hereafter make his headquarters in New York City; so he tells us.

The display of the Phoenix Glass Co. was among the finest of the exhibits, and spoken of highly. During the evening, when the lecture room was aglow from the circle of lights, they were shown at their best and highly spoken of by everybody. The only missing feature to this exhibit was the scarcity of their genial manager, Mr. A. H. Patterson, whose absence everybody regretted.

Charles A. Schieren & Co., of New York, had a fine display of their link belting on exhibition, which was ably taken care of and the merits fully described to all interested by Mr. Chas. A. Shieren, Jr., Mr. G. H. Fisher and E. A. Atkinson.

C. McIntire, of Newark, N. J., was on hand with a fine display of his wire connectors, which were voted by everyone present as the simplest and best connector in the market, it being an impossibility to make other than an everlasting connection.

The well-known veteran, Col. M. W. Goodyear, represented The E. S. Greeley Co., of New York. A better representative could not be found, even if he did get smothered in Pullman feathers during the hot fight between privates Godfrey and Latshaw.

Mr. Robert Coleman bobbed up serenely demonstrating the advantages of the indurated fibre pipe, which is made for underground work and will carry either water, gas or acids, or hold electric wires of all kinds; and claims it will not expand or contract by heat or cold.

The Bernstein Electric Company, of Boston, had a very fine display of incandescent lamps in full operation, receiving their current from the local plant. The company was represented by the genial Mr. H. B. Cram. Mr. Cutter, the Western representative, was also on hand.

A. L. Daniels, representing The Eureka Tempered Copper Co., of North-East, Pa., had a fine display of tempered copper on exhibition. The future of this company looks very bright, as tempered copper is a rare article and can be put to a great many profitable uses.

J. W. Godfrey, the genial manager of the New York Insulated Wire Company, of New York, was on hand with some fine samples of the Grimshaw tape. But "who stole his lunch coming home?" is what Mr. Godfrey would like to know, as he still holds the bills for the same (receipted, of course).

James F. Kelly, the genial sales agent of the big Edison Machine Works, was on hand and could always be found as busy as a bee. He says the trade in wires and cords was never larger or better in their factory than at present. He remained at Niagara Falls for the Edison convention, which will be largely attended.

Mr. George R. Turnbull, treasurer of the Butler Hard Rubber Co., had on exhibition some handsomely finished hard rubber storage cells and tubing, manufactured under the "Kiels process." These goods are destined to become very popular with the storage battery people, and others wishing a good article.

Alex. P. Wright, managing director of the Wright Electrical Construction Company, of Boston, was on hand to help Father McGlynn (Mr. Frank Ridlon) through. He was heard from repeatedly during the convention, and his amendment to the constitution would have been beneficial to the association; but he failed to be heard. Better luck next time, Alex.

The Sawyer-Man Electric Company was represented by F. E. Alexander and H. T. Barney, who exhibited their new series incandescent lamp and socket, designed for arc light circuits. In case of the failure of this series lamp from any cause, it is instantly cut out by the fusing of the plug placed in the thumb-piece. The catalogue distributed by this company is complete in itself; besides a valuable work on electricity was given away by them. They also had on exhibition their new double carbon lamp, which was much admired by all. This company usually furnishes one of the best displays in electric lighting, and the display this year was no exception to the rule.



NATIONAL ELECTRIC LIGHT ASSOCIATION.

SUCCESSFUL MEETING HELD AT NIAGARA FALLS AUGUST 6, 7, AND 8.—MANY INTERESTING AND IMPORTANT PAPERS READ.

FIRST DAY.—MORNING SESSION.

NIAGARA FALLS, August 6th, 1889.—The officers are E. R. Weeks, of Kansas City, president; A. J. DeCamp, of Philadelphia, 1st vice-president; E. A. Maher, of Albany, 2d vice-president; A. V. Garratt, secretary and treasurer.

The meeting was called to order at 10 a. m., in the Casino, at Niagara Falls, on August 6 by President E. R. Weeks, of Kansas City, Mo. His address was attentively listened to. He gave statistics showing the rapid increase in electric light and power interests throughout the United States, as well as abroad. He stated that \$275,000,000 were invested in the electrical interests and that it promised to be a profitable field for capitalists in the future.

Hon. W. C. Ely, of Niagara Falls, delivered an able and interesting address of welcome. He stated that the public had looked forward to this assemblage of electric light and power people and he extended a royal welcome now that they had arrived. "The falls of Niagara," he said, "would appear to all as the most interesting and wonderful feature of the locality, but the grandeur of this mighty waterfall cannot be appreciated on one examination. The cataract and rapids will most affect you. Your attention will be called to it irresistibly. For years the attention of the power producers have been turned toward the falls, and from all over this country and all parts of Europe have come suggestions and plans for the purpose of utilizing the power of Niagara, which is ample to furnish the future requirements of the eastern end of this continent." He believed we shall ultimately, it may not be for years, see all over this country and Europe, reservoirs supplied from rivers and streams, to supply in turn power for electric lights, so much faith had he in water power. The problem of the utilization of Niagara should specially attract the attention of the electric light and power people. It was already proposed to build a tunnel connecting the river with a point at the gorge below the falls, which would turn turbine wheels at numerous points along its route sufficient to furnish unlimited power. The address was received with applause. Secretary Garratt then read the roll and the following members and visitors registered their presence during the meeting:

- |                   |                    |                     |                  |
|-------------------|--------------------|---------------------|------------------|
| Alderson, F. S.,  | Hulberton, N. Y.   | Bloomington, D. S., | Chicago.         |
| Allan, J. B.,     | Chicago.           | Bates, M. E.,       | Kansas City, Mo. |
| Allen, G. D.,     | New York.          | Black, C. H.,       | New Orleans.     |
| Almsted, J. A.,   | Rochester.         | Calvert, W. H.,     | Cincinnati.      |
| Ackerman, P. C.,  | New York.          | Castle, W. W.,      | Boston.          |
| Alexander, P. H., | Boston.            | Candee, W. L.,      | New York.        |
| Alexander, F. E., | Boston.            | Coggeshall, H. F.,  | Fitchburg.       |
| Anderson, H.,     | Davenport, Ia.     | Coleman, R.,        | New York.        |
| Anthony, W. A.,   | Manchester.        | Corey, R. B.,       | New York.        |
| Atkinson, E. P.,  | New York.          | Cone, C. H.,        | Ansonia, Ct.     |
| Babcock, E. G.,   | Cuyahoga Falls.    | Crawford, F. A.,    | Boston.          |
| Babcock, C. A.,   | Cuyahoga Falls.    | Crouse, J. B.,      | Cleveland.       |
| Barthmann, A.,    | New York.          | Cullen, W. F.,      | New York.        |
| Barton, S. E.,    | Boston.            | Cutter, George,     | Chicago.         |
| Barney, H. C.,    | New York.          | Cram, W. B.,        | New York.        |
| Ball, F. H.,      | Erie, Pa.          | Cooper, Thos.,      | Toronto.         |
| Barker, F. E.,    | Boston.            | Cole, L.,           | Peoria.          |
| Bass, J. H.,      | Ft. Wayne, Ind.    | Culver, W. S.,      | Cleveland.       |
| Baird, M. E.,     | Windsor, Conn.     | Cooke, H. E.,       | Cincinnati.      |
| Beetle, G. L.,    | Chicago.           | Cox, S. E.,         | Cleveland.       |
| Besse, L. W.,     | Springfield, Mass. | Darrin, D. H.,      | Buffalo.         |
| Besse, H. R.,     | New Haven.         | Daniels, A. L.,     | North-East, Pa.  |
| Blackwell, E. D., | Montpelier, Vt.    | De Camp, A. J.,     | Philadelphia.    |
| Brady, T. H.,     | New Britain, Conn. | Decker,             | Cleveland.       |
| Burns, P. C.,     | St. Louis.         | Degenhardt, F. E.,  | Chicago.         |
| Botsford, C. R.,  | New York.          | De Land, F.,        | Chicago.         |
| Brooks, F. A.,    | Dayton, O.         | Duncan, S. A.,      | Pittsburgh.      |
| Buell, M. A.,     | Buffalo.           | Duncan, H. E.,      | Boston.          |
| Belote, J. C.,    | Norfolk, Va.       | Dumas, F. C.,       | New York.        |
| Blake, S. M.,     | Elmira.            | Davis, L. W.,       | Cincinnati.      |
| Brown, C. A.,     | Chicago.           | Ely, W. C.,         | Niagara Falls.   |
| Bradley, C. S.,   | Yonkers, N. Y.     | Edson, J. B.,       | New York.        |
| Bache, W. H.,     | Jersey City, N. J. | Eustis, H. H.,      | Boston.          |

- |                     |                          |                       |                      |
|---------------------|--------------------------|-----------------------|----------------------|
| Faben, C. R.,       | Toledo.                  | Possons, N. S.,       | Cleveland.           |
| Field, C. J.,       | Brooklyn.                | Pfannkuche, G.,       | Cleveland.           |
| Fisher, G. H.,      | New York.                | Penn, Jerome,         | Washington, O.       |
| Field, C. R.,       | New York.                | Pentz, J. A.,         | Philadelphia.        |
| Foster, A. L.,      | Hartford.                | Packer W. H.,         | Binghamton, N. Y.    |
| Foot, A. R.,        | Cincinnati.              | Parker, R.,           | St. Louis.           |
| Francisco, M. J.,   | Rutland, Vt.             | Palmer, W. C.,        | New York.            |
| Frick, W. E.,       | Trenton, N. J.           | Pritchard, F. E.,     | Cedar Falls.         |
| Findlay, J. H.,     | Ogdensburgh.             | Parker, W. H.,        | Binghamton.          |
| Gardner, R. M.,     | Hamilton, Ont.           | Rusling, C. S.,       | Kansas City.         |
| Griffith, C. B.,    | Rochester.               | Richards, C. R.,      | Brooklyn.            |
| Glasier, H. A.,     | Chicago.                 | Ransom, C. M.,        | Boston.              |
| Garden, Jno. A.,    | Wheeling.                | Ranck, D. A.,         | Fremont.             |
| Garratt, A. V.,     | New York.                | Reid, J. H.,          | Chicago.             |
| Godfrey, J. W.,     | New York.                | Redman, Geo. A.,      | Rochester.           |
| Goodyear, M. W.,    | New York.                | Reed, H. A.,          | New York.            |
| Gray, R. J.,        | New York.                | Ressequie, D. M.,     | Brooklyn.            |
| Gable, E.,          | Chicago.                 | Rhodes, B.,           | Niagara Falls, N. Y. |
| Henthorn, J. T.,    | Providence.              | Ridlon, Frank,        | Boston.              |
| Halm, W. G.,        | Chicago.                 | Richmond, C.,         | Fremont.             |
| Hayes, Webb C.,     | Cleveland.               | Roberts, E. P.,       | Cleveland.           |
| Haskins, C. C.,     | Chicago.                 | Rosenstamm, S.,       | New York.            |
| Heinrich, R. O.,    | Philadelphia.            | Ross, R. F.,          | Boston.              |
| Hill, H. W.,        | Cleveland.               | Russell, D. R.,       | St. Louis.           |
| Hitchcock, C. A.,   | North-East, Pa.          | Rudd, C. H.,          | Chicago.             |
| Huntley, C. R.,     | Buffalo.                 | Ryan, J. F.,          | Philadelphia.        |
| Haeberle, G.,       | Suspension Bridge, N. Y. | Sayers, W. P.,        | Boston.              |
| Hyman, D.,          | New York.                | Schieren, C. A., Jr., | New York.            |
| Hoeveler, J. A. E., | Pittsburgh.              | Schmidt, E. D.,       | Cuyahoga Falls.      |
| Hover, P. H.,       | New York.                | Scoville, T. L.,      | New York.            |
| Haley, C. S.,       | Boston.                  | Seymour, A. P.,       | Syracuse.            |
| Johnson, C. F.,     | New York.                | Shay, J. H.,          | Chicago.             |
| Kelly, J. F.,       | New York.                | Smith, T. C.,         | Philadelphia.        |
| Kerr, W. C.,        | New York.                | Smith, G. M.,         | Chicago.             |
| Killicutt, D.,      | Boston.                  | Small, H. H.,         | Chicago.             |
| Kinsman, F. E.,     | New York.                | Smith, C. D.,         | Worcester.           |
| Kreidler, W. A.,    | Chicago.                 | Smith, Chas.          | Cleveland.           |
| Kempt, Alex.,       | Chicago.                 | Stump, C. E.,         | New York.            |
| Kitton, Frank,      | Buffalo.                 | Swetland, H. M.,      | New York.            |
| Lawrence, W. H.,    | Cleveland.               | Sayles, W. P.,        | New York.            |
| Law, M. D.,         | Philadelphia.            | Scoville, J. S.,      | Cleveland.           |
| Leonard, S. S.,     | Minneapolis.             | Seymour, J. A.,       | Auburn, N. Y.        |
| Lockwood, J. E.,    | Detroit.                 | Seymour, J. H.,       | New York.            |
| Lufkin, H. L.,      | New York.                | Stern, P. K.,         | New York.            |
| Lynch, E. T., Jr.,  | New York.                | Smead, S. F.,         | Cleveland.           |
| Lean, G. R.,        | Boston.                  | Tesla, Nikola,        | Pittsburgh.          |
| Latshaw, Z.,        | New York.                | Tremaine, H. A.,      | Cleveland.           |
| LeVake, L. B.,      | Cleveland.               | Temple, —             | Dayton, O.           |
| Lucas, H. P.,       | New York.                | Thornberry, H. S.,    | Toronto.             |
| McGrath, W. H.,     | New York.                | Taltavall, J. B.,     | New York.            |
| Manson, Geo. T.,    | New York.                | Taylor, Chas. A.,     | St. Louis.           |
| Marsh, J. W.,       | Pittsburgh.              | Temple, W. H.,        | New York.            |
| Mason, J. H.,       | Boston.                  | Turnbull, Geo. R.,    | Brooklyn.            |
| Martin, C. C.,      | Parkersburgh, W. Va.     | Vincent, C. R.,       | New York.            |
| Mack, W. E.,        | Red Creek.               | Waterhouse, F. G.,    | Pittsburgh.          |
| Markland, W. H.,    | Altoona.                 | Weeks, E. R.,         | Kansas City.         |
| Merrill, O. H.,     | New York.                | Western, B. R.,       | New York.            |
| Martin, T. C.,      | New York.                | Webb, H. E.,          | Pittsburgh.          |
| Maher, E. A.,       | Albany.                  | Weber, C.,            | Buffalo.             |
| McQuade, G. S.,     | Philadelphia.            | Wetzler, Jos.,        | New York.            |
| McIntire, C.,       | Newark, N. J.            | White, E. F.,         | Brooklyn.            |
| McQuaide, J. P.,    | New York.                | Whipple, Fred. H.,    | Detroit.             |
| Metcalf, E. R.,     | Boston.                  | Wilson, W. T.,        | Buffalo.             |
| Morrison, J. Frank, | Baltimore.               | Wilmerding, C. H.,    | Chicago.             |
| Morris, Robt. L.,   | Nashville.               | Williams, E. B.,      | Boston.              |
| Morrison, W. J.,    | Toronto.                 | Wonham, W. C.,        | New York.            |
| Moses, Dr. Otto A., | New York.                | Wright, J. J.,        | Toronto.             |
| Olmstead, J. A.,    | Rochester.               | Wright, Alex. P.,     | Boston.              |
| Orford, J. M.,      | Bridgeport.              | Wyman, F. A.,         | Boston.              |
| Peck, E. F.,        | Brooklyn.                | Webber, A. J.,        | Cleveland.           |
| Pettingell, F. E.,  | Boston.                  | Williamson, J. H.,    | New York.            |
| Phelps, Geo. M.,    | New York.                | Wilkins, F. W.,       | New York.            |
| Pond, A. C.,        | Boston.                  | Wisner, A. P.,        | New York.            |
| Pope, H. W.,        | New York.                | Wright, C. F.,        | Cleveland.           |
| Porter, Geo. F.,    | Philadelphia.            | Young, C. G.,         | New York.            |
| Price, Chas. W.,    | New York.                | Young, G. M.,         | New York.            |

Secretary Garratt then read the following letter:

MAYOR'S OFFICE,  
NEW YORK, July 17th, 1889.

E. R. WEEKS, Esq., *Pres't N. E. L. Ass'n.*

Dear Sir.—I request your presence at a conference of representative citizens to consider the feasibility of holding an international exposition at New York in 1892, and to arrange for the preliminary work, if it is deemed advisable. I hope you will be kind enough to attend at my office on Thursday, the 25th of July, at 3.30 o'clock.

Yours truly,

HUGH J. GRANT, *Mayor.*

President Weeks stated that he regretted very much his inability to attend the conference, which was held on July 25th.

Mr. F. E. Degenhard, of Chicago, suggested that Chicago was in the field as a competitor for the World's fair, but on motion of Mr. DeCamp, of Philadelphia, the matter was referred to the Executive Committee to formulate a report for the afternoon session.

Chairman Rhodes, of Niagara Falls, then announced that an excursion to Lewiston would be given at 7 p. m., for the purpose of giving the visitors an opportunity to witness the river below the falls, and the beautiful scenery and commercial advantages of the river. He also stated that to-morrow night a banquet would take place at the International Hotel.

The session adjourned until 2 p. m.

#### AFTERNOON SESSION.

The afternoon session was called to order at 2.30 p. m.

Mr. Rhodes, of Niagara Falls, offered the following resolution as the sense of the Executive Committee of the Association, in reply to Mayor Grant's letter, printed above:

RESOLVED, that this Executive Committee recommend to the association that the president be authorized and directed to appoint a committee of five members on the pending International Exposition of 1892, whose chairman shall represent this association on the conference committee called for by his Honor, the mayor of New York City.

The resolution evoked considerable discussion, which occupied one hour's time, and was participated in by Mr. Degenhardt, of Chicago, who announced that he had received a telegram from J. P. Barrett, electrician of the city of Chicago, informing him that the association should cooperate with Chicago's mayor, in making the World's fair to be held in Chicago, a success, and also by W. A. Kreidler, Alex. Kempt, C. A. Brown, of Chicago. The objection to the resolution seemed to lodge in the fact that it might appear that this association favored New York as the location for the World's fair, which they intimated was not the case.

Mr. DeCamp, of Philadelphia, R. L. Morris, of Nashville, Dr. Otto A. Moses, of New York, J. F. Morrison, of Baltimore, and H. W. Pope also spoke on the subject, and after an amendment by Mr. C. A. Brown was adopted, the resolution as above prevailed without dissent.

Dr. Otto A. Moses, as chairman of the committee on revision of the constitution, reported the following as the result of the labors of the committee:

#### PROPOSED CONSTITUTION.

*Article I.*—Name. This association shall be entitled The National Electric Light Association.

*Article II.*—Object. The object of this association shall be to foster and protect the interests of those engaged in the commercial production of electricity for conversion into light, heat, and power; and of manufacturers of apparatus and supplies used in these industries.

*Article III.*—Members. Sec. 1.—Members shall be divided into three classes: active, associate and honorary, of which the first only shall be entitled to vote. Sec. 2.—Active members shall be: corporations or individuals engaged in the business of producing and supplying electricity for light, heat, or power, for commercial or public use; and the members of the Executive Committee. Sec. 3.—Associate members shall be electricians, electrical or mechanical engineers, manufacturers and individuals who are otherwise directly or indirectly interested in advancing the uses of electricity. Sec. 4.—Honorary members of the association may be elected upon the unanimous recommendation of the Executive Committee and approval by a two-thirds vote of the association.

*Article IV.*—Officers. Sec. 1.—The officers of the association shall be a president, two vice-presidents, a treas-

urer and a secretary, and an executive committee, to consist of the above named officers, *ex-officio*, and nine other members, of whom three shall be selected from among the associate members. Sec. 2.—The president and vice-presidents shall be elected by ballot, to serve from the close of the annual meeting at which they are elected until the close of the next annual meeting. Sec. 3.—No person shall be eligible for the office of president or vice-president for more than two successive terms; but this shall not be construed to forbid the election to the office of president of one who has served as vice-president. Sec. 4.—The secretary and treasurer, who may be one and the same person, shall be nominated by the president, subject to confirmation by the Executive Committee. The salary of the secretary shall be fixed by the Executive Committee; and he shall have an office in the city of New York. Sec. 5.—The Executive Committee shall be chosen by ballot at each meeting, either annual, semi-annual or special, and shall hold office from the close of the meeting at which its members are elected until the end of the meeting at which their successors are chosen. Sec. 6.—The treasurer, secretary and Executive Committee shall make written reports at each meeting, which reports, upon their acceptance, shall be spread upon the records of the association. Sec. 7.—The Executive Committee shall be the governing body of the association. It shall meet at the call of its chairman, from time to time, and shall report upon applications for membership, shall gather and prepare information on topics of interest, and shall arrange for discussions at the several meetings of the association. Five members of the committee shall constitute a quorum.

*Article V.*—Meetings. The annual meeting of this association shall be held in February, and a semi-annual meeting may be held in August of each year, at such places as the association shall determine, and on such dates as may be determined by the Executive Committee.

*Article VI.*—Dues. The annual dues for both active and associate members shall be \$20, payable in advance, and shall cover the calendar year.

*Article VII.*—Ballot. A ballot may be demanded by ten of the members present on any question before the association.

*Article VIII.*—Amendments. Sec. 1.—Amendments to the constitution shall be presented in writing and shall be referred to a committee, to be appointed by the chairman, before being acted upon by the association; a two-thirds vote of those present shall be necessary to their adoption. Sec. 2.—No amendment shall be voted upon on the day of its first presentation.

Respectfully submitted, Otto A. Moses, chairman; Willard L. Candee, A. J. De Camp, Marsden J. Perry, H. D. Stanley, committee.

The same was made a special order of business for Thursday at 11 a. m.

Mr. Eugene T. Lynch, chairman of the committee on underground work, requested an extension of time until the next meeting of the association in which to report. Granted.

Mr. A. R. Foote, of Cincinnati, then read a paper on "the Value of Economic Data to the Electric Industry," after which he offered the following preamble and resolution, which was unanimously adopted:

WHEREAS, It is desirable that this association shall collect for the use and benefit of its members, complete and accurate data regarding all important details involved in installing, operating, maintaining and administering the plants and business of central station companies;

BE IT RESOLVED, that a committee of five be appointed by the president to report at the next convention of the association, forms and a system of records and accounts to be kept by central station companies, a system for reporting the same to the association, and for comparing and

publishing the data, so secured for the use and benefit of the members of the association.

J. F. Morrison, of Baltimore, highly complimented Mr. Foote for the gigantic work he had done for the benefit of the association, and stated that that gentleman had spent more money in its welfare than any other member of the association. Mr. R. L. Morris, of Nashville, A. J. De Camp, of Philadelphia, H. F. Coggsell, of Fitchburg, Mass., and F. P. Whipple, of Detroit, also praised the excellent points raised by Mr. Foote, and believed good would naturally accrue to the members from its adoption.

Mr. M. D. Law, of Philadelphia, then read a paper on the "Theoretically Perfect Arc Light Station," which was afterwards discussed by Messrs. Smith, De Camp, Morrison and Leonard.

President Weeks appointed as the committee to assist Mayor Grant in the International Exposition, Dr. Otto A. Moses, of New York, Chairman; E. T. Lynch, Jr., of New York, C. J. Field, of Brooklyn, Fred. Gilbert, of Boston, and J. F. Morrison, of Baltimore. Committee on electrical statistics: A. R. Foote, of Cincinnati, chairman; A. J. De Camp, of Philadelphia, C. R. Huntley, of Buffalo, E. F. Peck of Brooklyn, and S. S. Leonard, of Minneapolis, Minn.

The convention adjourned until August 7th, at 10 a. m.

SECOND DAY—MORNING SESSION.

NIAGARA FALLS, August 7, 1889.—The morning session was called to order by President Weeks at 10 o'clock a. m. Secretary and Treasurer Garratt read his report, which was ordered filed. It is as follows:

REPORT OF SECRETARY AND TREASURER.

NEW YORK, July 31st, 1889.

RECEIPTS AND DISBURSEMENTS.

Cash balance from last report.....	\$3,003 82
Dues received from 76 members.....	1,520 00
Sale of printed matter.....	2 00
Received from Ex-Treasurer W. H. Harding.....	299 73
<b>Total receipts since last report.....</b>	<b>\$4,825 55</b>
Expenditures, as per accompanying vouchers, approved by the Executive Committee.....	\$3,725 62
Balance, cash on hand.....	1,099 93
	<b>\$4,825 55</b>

The present indebtedness is \$259.60, which is part of the funds advanced to the Association by Ex-President S. A. Duncan.

The expenditures since the last report may be classified as follows:

Bills incurred previous to the Chicago Convention.....	\$1,483 82
Salary of Secretary and Treasurer, six months.....	999 96
Clerk hire month of February.....	40 00
Postage.....	127 96
Stationery and printing (not including the official proceedings).....	234 03
Printing the official proceedings.....	334 26
Official stenographic report of Chicago Convention.....	161 25
Rent of office.....	157 50
Advertising in electrical journals.....	55 00
Expenditures not specified above.....	131 84
	<b>\$3,725 62</b>

It will be noted from the official record of the New York Convention that the account of the ex-treasurer called for a cash balance of \$1,935.23, whereas the present treasurer has received only \$299.73. The treasurer would here state that he has received from the Executive Committee vouchers covering the difference between the above amounts. He has also received from the ex-treasurer Harding, \$34.25, which did not belong to the general funds of the Association, but was donated by members to the Committee on Patent Legislation. This sum has been turned over to the chairman of that committee.

MEMBERSHIP, INCOME AND EXPENSES.

The number of members in good and regular standing, on February 19, 1889, as per official report accepted at the Chicago Convention, was 175; new members since that date, 76; making total membership at present 251.

The membership of the Association has increased during the last year 55 per cent.

It has increased in the last six months 30 per cent.

The annual income of the Association is at present \$5,020.00.

Its running expenses for the last six months were \$2,241.80.

Mr. P. H. Alexander, chairman of the committee on Harmonizing Electric Light and Insurance Interests, then rendered his report. He read several letters from insurance associations testifying to their willingness to endorse any proper methods to improve the present system of wiring. The Boston underwriters stated in their communication to the Association that it was necessary in that vicinity to obtain license for wiring from competent electrical people. If this was not obtained the insurance premiums were increased ten cents. Mr. Alexander concluded his address as follows: "The committee would especially recommend that examining boards be formed in the different districts, composed of several States, where men seeking employment as dynamo tenders, wiring superintendents, or others holding responsible positions in conjunction with electric light installation, can be examined, and to whom can be issued by the organization a certificate of efficiency, stating the qualification, and for what particular work the man possesses.

The committee would also recommend that members of this association pledge themselves to have all men in their present employ examined in the manner proposed and not to employ any person hereafter not provided with such certificates. In doing this the confidence of the insurance people will be speedily restored, and they will see that the electric light interest is beginning to have pride in its own work and is trying to live down the bad reputation certainly earned by some individuals in former electric installations." The paper is signed by P. H. Alexander, chairman; H. B. Cram, M. J. Perry, M. J. Francisco and H. E. Barton.

This paper was ably discussed by S. E. Barton, of Boston; Messrs. Bouton and Anderson, of New York; J. F. Ryan, of Philadelphia; A. J. DeCamp, of Philadelphia; M. J. Francisco, of Rutland, Vt., and R. L. Morris, of Nashville, Tenn.

Mr. R. L. Morris, of Nashville, Tenn., moved the establishment of a co-operative insurance company to accept risks on electric light installations, if the regular line companies continued to discriminate against such property.

Mr. S. S. Leonard, of Minneapolis, stated that his insurance premium was raised one per cent. on substituting petroleum fuel for coal, although the inspectors admitted there was no greater risk attached to the property.

Mr. J. F. Morrison, of Baltimore, Md., hoped the electric Light Association would attend to its own business and the underwriters to theirs. He did not believe that Jack-of-all-Trades would ever succeed, and there was not the material and inclination in the association to establish an insurance company.

The motion of Mr. Morris was referred to the committee on harmonizing electric light and insurance companies.

Mr. C. A. Brown, of Chicago, offered the following:

*Resolved,* That a committee of three be appointed by the president to present to the proper committee of Congress a petition from the National Electric Light Association in regard to the abolition of duty on copper wire, plates and sheet bars and rods. Adopted.

The president appointed C. A. Brown, of Chicago; George M. Phelps, of New York, and J. F. Morrison, of Baltimore, as such committee.

Mr. J. T. Henthorn, of Providence, R. I., read a paper on "An Ideal Station" from a mechanical standpoint. At 1.30 the convention adjourned until 2.30 p. m.

AFTERNOON SESSION—SECOND DAY'S PROCEEDINGS.

The regular order of business was dispensed with and the whole of the afternoon session of the association was devoted to the discussion of killing by electricity. Dr. Otto A. Moses, of New York, and Mr. Wyman, of Boston, addressed the convention on the subject. Mr. Wyman read a paper on the illegality of execution by methods "cruel and unusual," and gave the result of a laborious search of the records from the seventeenth century to the present time, and which sustain him in that assumption. Dr. Moses, in an address in which close reasoning, voluminous statistics, scientific facts and strong appeals were mingled, invoked the association to unite in protest and effort, to discountenance this horrible use of a most valued friend as a public executioner. He showed that at the bottom of the philanthropy which enacted the law, was a slime of jealous interest that had been fortunately stirred up to the surface by the courts of New York and which they would probably soon settle forever. He demonstrated that instead of being a painless and merciful death, killing by electricity was a most dreadful punishment—one which was fortunately not known to the Spanish Inquisition. He had before him hundreds of letters from nearly all the electric light stations in the United States. These were replies to inquiries about the accidents which had happened in them from heavy dynamo currents both continuous and alternating. In nearly all cases where the shock has not proved fatal, it was declared that the sensations were terrific. Yet, while most of those persons who were injured soon recovered from the effects, they nearly all unite in declaring the pain of the shock agonizing in the extreme. One most remarkable fact, however, was developed from this voluminous mass of statistics, viz.: that scarcely any two accidents seemed to be accompanied by the same sensations. They varied from such sensation as compressing the chest in a vice, being drawn like wire, being hammered to death, "smashed," stuck full of needles, being cut through with a buzz saw, dashed to pieces from a height, and being shaken to death. The conclusions drawn by Dr. Moses from comparison of these statistics are: that there is no certainty whatever in death resulting from heavy currents. Second, that they are invariably accompanied by the most terrific pains, and third, that in the majority of cases, consciousness remains until the human body is separated from the circuit.

Dr. Moses concluded, after giving words of praise to Mr. Bourke Cochran for his disinterested efforts in the notorious Kemmler case, to prove before the courts the inexpediency and impropriety of substituting execution by electricity for hanging. He then offered a resolution calling upon Governor Hill to use his influence for the repeal of the obnoxious law which now stains the statute book of New York.

The resolution reads as follows:

WHEREAS, The law requiring the execution of criminals by electricity, enacted by the General Assembly of the State of New York, was enacted under the misapprehension of its philanthropic importance or value, and

WHEREAS, The National Electric Light Association regards such a law as an unnecessary degradation of the most useful natural agent that science has ever rendered available for the service of man;

BE IT RESOLVED, 1st. That the National Electric Light Association do hereby respectfully petition the General Assem-

bly of the State of New York to repeal said law at its next session.

2d. That in view of the doubtful expediency of said law and the petition for its repeal, the Governor of the State of New York, or the proper pardoning authority, be requested to commute the sentence of all criminals condemned to be executed by electricity to imprisonment for life until said law is repealed.

3d. That a copy of this preamble and resolution be forwarded at once, by the secretary of the association, to the Governor of the State of New York, or other proper officers, and that the chairman of the committee on State and Municipal Legislation supply a copy to each member of the General Assembly of the State of New York, at its next session, together with copies of such papers as the committee may have at its disposal, urging the repeal of said law.

The resolution was unanimously adopted.

Dr. Fell, of Buffalo, who has just been appointed assistant to Harold P. Brown, State Electrician, was invited to give an expression of his opinion on the subject. A lengthy discussion then ensued as to the advisability of killing criminals by electricity, which was participated in by Prof. Ransom, of Boston, A. V. Garratt, of New York, F. E. Degenhardt, of Chicago, and J. F. Morrison.

Mr. E. T. Lynch, jr., of New York, moved that a committee of seven, of which E. A. Maher, of Albany, act as chairman, be appointed to present the resolutions to the Governor of the State. Carried.

The chair appointed E. A. Maher, of Albany, N. Y.; E. T. Lynch, jr., of New York; H. C. Davis, of New York; J. F. Kelly, of New York; C. R. Huntley, of Buffalo; F. A. Cheney, of Elmira, N. Y.; Charles Cooper, of Brooklyn, as the committee.

J. F. Morrison, of Baltimore, moved that when the convention adjourn it be until seven p. m. Carried.

The regular order of business was then resumed and a lengthy discussion on the subject of an "Ideal Station" took place, after which Mr. E. T. Lynch offered the following:

WHEREAS, It is the belief of the members of this association that the electric motor service upon street railways will require a service of electric current for the motor that will be reliable and constant, and that the various electric light stations are capable of generating and distributing such current;

RESOLVED, That a committee of three be appointed by the president who shall endeavor to make such arrangements with the manufacturing companies that they should adopt some *standard potential* to be used upon the various railways, the committee also to collect such data regarding the supply of current to railways as may be deemed of interest to the association. The resolution was adopted and E. T. Lynch, jr., of New York, Mr. Smith, of Brooklyn, and C. A. Terry appointed as said committee.

The secretary then read a letter of regret from Mr. W. Bracken, of New York, stating that he would be unable to be present to read his paper on "The Development and Progress of the Storage Battery." He, however, delegated Mr. C. G. Young to read the paper for him.

J. F. Morrison, of Baltimore, moved that a committee of five be appointed to present names of an executive committee and select a place for the next meeting of the association to report this evening. Carried.

The chairman appointed J. F. Morrison, E. T. Lynch, jr., Mr. C. C. Martin, of Parkersburg, W. Va., C. A. Brown, of Chicago, and A. J. De Camp, of Philadelphia, as such committee.

Owing to the unsatisfactory condition of the electric light system the evening session was abandoned.

## THIRD DAY.—MORNING SESSION.

NIAGARA FALLS, August 8th, 1889.—The meeting was called to order at 9.30 a. m. by President Weeks.

Mr. A. R. Foote, of Cincinnati, as chairman of the committee on State and Municipal legislation, read his report, which consisted of extracts of legislation acted upon in the various States affecting electric lighting interests. After some interesting discussion by Messrs. De Camp, Rhodes, Leonard and Lynch, the report was adopted.

The secretary then read the following :

BALTIMORE, Md., August 5th, 1889.

ALLAN V. GARRATT :

Dear Sir : I have your favor of some days since and am sorry to say I will be unable to be with you at the convention at Niagara. Please say to the convention for me that the plans of the legal committee are all in shape to begin operations upon the fifty-first Congress as soon as it convenes. Judge Culberson, who was the chairman of the Judiciary Committee of the last session, I am told, will be upon the same committee the coming winter, and out of courtesy to him our bill will be taken up among the very first acted upon and his previous report adopted. I hope we may be able to induce him and the other members of the court to recommend the passage of the bill as it was originally filed, providing for five judges instead of three, as recommended by the committee report of last year. There is every reason to suppose that we will have little trouble in passing the bill through the fifty-first Congress, and if we succeed the National Electric Light Association may congratulate itself upon having achieved a very great reform in the Patent system of the United States. The work of the committee, during the next six months, shall have my best efforts and I feel sanguine of success.

Very truly yours, ARTHUR STEUART.

Mr. C. C. Haskins, of Chicago, delivered an address on "Station Accessories in the Shape of Measuring Instruments."

Mr. Benjamin Rhodes, of Niagara Falls, read a paper on the "Economical Size of Line Wire for Constant Current Circuits," which was as follows :

The writer has for some time been accustomed to use a formula for finding the economical size of line wire for constant current circuits and has been requested to present it at this time. With the knowledge that it is not new, and yet that it is needed by many practical electricians, the following is submitted :

- Let X = diameter of line wire in mils.  
 " A = length of circuit in miles.  
 " B = price of copper per pound.  
 " C = cost of power per year of horse-power.  
 " E = ampères of current.

When any plant is to be established, B and E are known, C can be determined near enough for our purpose, and A will be found to be immaterial.

- .016 X<sup>2</sup> = pounds of wire per mile.  
 .016 B X<sup>2</sup> = cost per mile of wire.  
 .0016 B X<sup>2</sup> = interest and depreciation at 10 per cent.  
 .0016 A B X<sup>2</sup> = annual cost of wire. (1)

$$\frac{54577}{X^2} = \text{ohms per mile.}$$

$$\frac{54577 E^2}{X^2} = \text{watts per mile.}$$

$$\frac{54577 E^2}{746 X^2} = \text{horse-power lost in transmission per mile.}$$

$$\frac{54577 C E^2}{746 X^2} = \text{cost of same.}$$

$$\frac{54577 A C E^2}{746 X^2} = \text{annual cost of power lost in entire circuit. (2)}$$

It is plain that with any increase in the size of wire the value of (1) will increase while (2) will diminish, and the economical value of X will be such that the sum of (1) and (2) will be a minimum.

Let u = this sum.

$$u = .0016 A B X^2 + \frac{54577 A C E^2}{746 X^2}$$

Differentiating.

$$\frac{du}{dx} = .0032 B X - \frac{109154 E^2 C}{X^3}$$

Placing this equal to zero, and reducing, we have :

$$X^4 = \frac{45700 E^2 C}{B}$$

This formula shows that diameter of wire depends on price of copper, cost of power, and quantity of current, and is entirely independent of the length of circuit and voltage.

The differential co-efficient shows that the formula is in harmony with Sir William Thomson's rule that "the additional running expense due to the resistance of the conductor shall equal the interest on its first cost."

Price of copper refers to the bare wire without any covering or insulation whatever. The insulating cover is a mere matter of choice, like a brick stone or frame station.

A few examples are added for illustration, the price of copper assumed at twenty cents per pound for facility of calculation.

What size wire should be used in a transmission of power plant using a 40 ampère current, power costing one hundred dollars per year per horse power ?

Here E = 40, C = 100, B = 20, substituting X = 427 mils or nearly 0000 wire B. & S. gauge.

If the power cost fifty dollars per year then C = 50 and X = 359 or 00 B. & S. With water power at ten dollars per year, X = 240 or between 2 and 3 B. & S.

Should a 20 ampère current be used in the three cases above, the results would be respectively :

- X = 302 larger than 1 B. & S.  
 X = 250                      2 B. & S.  
 X = 170 between 5 and 6 B. & S.

What size wire is economical in an ordinary city arc light ten-ampère circuit steam power costing fifty dollars per year ?

$$E = 10 \quad C = 50 \quad B = 20$$

Giving X = 180 or No. 5 B. & S.

Suppose water-power can be furnished at Niagara Falls for ten dollars per horse-power per year and a ten ampère current generated by this power be used for street lighting in Buffalo, the entire length of circuit being fifty miles, what is the economical size of line wire ?

A substitution in our formula gives X = 120 mils equal to No. 8 wire B. & S. or exactly No. 11 Birmingham wire gauge.

The subject of the new constitution was brought up and Mr. C. A. Brown, of Chicago, moved that the new constitution be accepted as read. Adopted.

Mr. Brown also moved that the executive committee be instructed to formulate by-laws and rules for the government of the association. Carried.

Mr. G. W. Mansfield, of Boston, read a paper on "Electric Street Railways."

Professor Roberts, of Cleveland, O., then delivered an address on "Electrical Transmission of Power," which he illustrated.

The committee appointed to name the place for the next meeting of the association and the executive committee reported in favor of Kansas City, Mo., and the following committee: G. W. Clark, of Kansas City, chairman; L. A. Beebe, of Hutchison, Ks.; J. A. Corby, of

St. Joseph, Mo. ; B. E. Sunney, of Chicago ; S. S. Leonard, of Minneapolis ; C. R. Fabian, of Toledo ; F. Ridlon, of Boston ; B. H. Alexander, of New York and J. F. Morrison, of Baltimore.

Mr. F. H. Whipple moved that the name of St. Louis be substituted as the place for the next meeting of the association and after some discussion the substitution was carried by a vote of 11 to 19.

The question as to whether the convention was working under the new constitution was raised. President Weeks decided that the new constitution now governed the deliberations.

At this point President Weeks called upon Mr. J. F. Morrison to assume the chair. On taking his position Mr. Morrison called for the business before the convention. Another vote was then had on the question of meeting in Kansas City and the chair declared the report of the committee adopted.

A motion to adjourn was then carried.

REPORT OF THE EXECUTIVE COMMITTEE OF THE NATIONAL ELECTRIC LIGHT ASSOCIATION.

NIAGARA FALLS, August 8th, 1889.—Your Executive Committee, appointed at the Chicago Convention, was so scattered throughout the country that it was found too inconvenient and expensive to have meetings of the entire committee ; therefore the various matters of interest were delegated to sub-committees, who have united to make this report.

One of the most important matters before the committee was the establishment of permanent headquarters in the city of New York. The experiment had been tried a few months and, at the Chicago Convention, it was ordered to be continued six months more.

Your committee have moved the office from 23d street, to the elegant Telephone Building, No. 18 Cortlandt street, in the center of the electrical business district and convenient for both resident and non-resident members.

The work done by the secretary at this office shows itself in the largely increased membership of the association, and in the work of the various committees which have reported at this convention. The committee have no hesitation in saying that the success of a permanent headquarters has been in advance of their expectations, and earnestly recommend that the New York office be continued.

The volume of proceedings of the Chicago Convention has been made up in better form than heretofore, and the cloth binding changes the pamphlet which may be thrown into the waste basket to a book worthy of a place in any library. Members have heretofore been limited to a single copy of the proceedings, but your committee have provided that hereafter further unbound copies, to a reasonable limit, may be supplied to members without charge, and the binding may be added to the current or previous volume at cost.

Your committee are glad to be able to present a good report as to the finances of the association. The year 1888 closed with a debt of \$1,800. This debt has been entirely wiped out, with a single exception hereinafter referred to. The entire expense of the current year to August 1st had been paid at that time. There were no outstanding bills, and a balance remained in the treasurer's hands of \$1,096.93. The income of the association for the calendar year will be over \$5,200 ; the expense about \$1,000 less. So that your committee can say, with some confidence and much satisfaction, that the association is in a sound financial condition. There is, as just mentioned, one claim against the association still unpaid. The amount is \$259 60. This was incurred before the appointment of this committee, but your committee recommend that authority be given them for its payment. The preparation

for this convention has been part of the labor of this committee. The character of the papers presented is such that the report cannot but add to the growing influence of the association.

The question of exhibit has been a perplexing one. The exhibit at Chicago grew to such large proportions that any exhibit at this convention was discouraged. It was found, however, that some exhibitors are members, and pay dues solely for this purpose, and others have novelties brought out since the last convention. Therefore, while a large exhibit has not been encouraged, it has been left to the members, with the proviso that there should be no expense in the matter to the association. This matter of exhibit is one that will call for careful consideration by future committees.

In this connection your committee wish to express thanks to the Niagara Falls Hydraulic Power and Manufacturing Company and the Oneida Community, Limited, for unusual courtesies extended during the convention.

Respectfully submitted,

BENJAMIN RHODES,  
*Chairman Executive Committee.*

SUB-COMMITTEE REPORT.

We, the undersigned, a sub-committee of the Executive Committee appointed for the purpose, beg leave to report the following as embodying the views of the Executive Committee :

WHEREAS it is extremely important that the United States census for 1890 should contain a special section for the electric industry, and that the data for such section should be collected, tabulated and published in a thorough and systematic manner ;

BE IT RESOLVED that the National Electric Light Association, now in convention, respectfully request the Superintendent of the United States Census for 1890 to provide a section for the electric industry, and they would suggest that Mr. Allan R. Foote, of Cincinnati, Ohio, has proved himself well qualified to do this work, and that he would be a proper person to organize and direct it.

Signed : Edwin R. Weeks, Otto A. Moses, T. Carpenter Smith.

The Julien Electric Company's storage batteries, on the Fourth avenue R. R. here in this city, have proven so successful that thirty new cars were ordered. The first car of this lot was put on last week, and seven more are now ready. The electric cars are very popular as well as successful.

The great legal struggle between Thomas A. Edison and Geo. Westinghouse, the representatives of two of the big electric companies of the country, commenced at Pittsburg last week. The question at issue is as to who is the inventor of the carbon used by the companies.

Electric wires and dynamos on board ship have sometimes seriously disturbed the needle of the compass. Sir William Thomson has discovered that if the alternating system be used the disturbance is not so great.

When electricity is used in surgical cases of a serious nature extreme care has been found necessary, especially when negative electricity is used.

M. M. Slattery, of the Fort Wayne Jenney Electric Light Co., has constructed a tricycle, which he uses in the streets of Fort Wayne.

*Pittsburg Chronicle* : The mill-a-word telegraph rate ought certainly to apply to prize-fights, if to nothing else.

The gramophone has been greatly improved by employing sheet zinc for the record plate.

An electric light plant is to be installed at Westfield, N. J., very soon.

## MACHINE TELEGRAPHY OF TO-DAY.

To the Editor of THE ELECTRIC AGE :

In the July number of *Scribner* appeared an article upon a very interesting subject, entitled "The Telegraph of To-Day," by Charles L. Buckingham, which it was advertised "would describe the wonderful advances which have been made in Telegraphy since the days of Morse and Vail." As a simple recital of facts, which are generally known, it may be considered a useful and harmless article; but as a history of and argument against "Automatic" or "Machine Telegraphy," it is a failure, and the reason therefor is manifest, since the writer labors under two difficulties: in the first place he is not well informed upon either the mechanical or electrical methods used in the new systems, and, in the second place, being in the employ of the Western Union Co., as "Chief Electrical Expert," he is compelled to write his article from the stand-point of that Company, whose policy has ever been to discourage and misrepresent any and every method or improvement that appears, until they acquired it.

Therefore we see, as we would expect to see, that Mr. Buckingham entirely ignores all that Little and Craig accomplished in 1869-'70, in increasing the electrical capability of an ordinary wire from 15 to 25 words by the Morse system, to 600 or more words per minute by the Automatic system; which system I successfully developed and operated between New York and Washington in 1870-'71, in defiance of the denunciations and ridicule of the W. U. Co. He also ignores, or forgets to mention, the first great stride that was made in telegraphy after its invention, and which did more to simplify, cheapen and improve the Morse system than all else, viz.: the introduction of reading by sound, by Ex-Governor Cornell, the late Gen. Stager, and their compatriots, in 1852-'53.

Mr. Buckingham names as the first, if not the only great improvement in telegraphy, the Stearns Duplex system, of 1872, by which all Morse wires were doubled in transmitting capacity, but *without any saving in the expense of operators, in battery or in any other item, except the bare wire.* This improvement he dwells upon with great emphasis, and well he may, as it is the first, and, practically the only important improvement in telegraphy to which the W. U. Tel. Co. can lay any claim, with the exception of the Quadruplex, which was a natural outcome of the Duplex, but which, in economy, is decidedly inferior to the Duplex, and in volume of telegraphing is not, as a whole, any greater, with its eight operators and one wire, than is the Duplex with its six operators and three wires. Mr. Buckingham had, or could have, if he desired to have before him the testimony relative to the automatic system, of Mr. Beach, the Editor of the *Scientific American*, Sept. 22, 1870, who certifies that he received from his own correspondent, at Washington, "600 words per minute, in a message which was distinctly legible:" also a statement of John A. J. Cresswell, P. M. General, June 30, 1873, that the speed of transmission from Washington to New York, by the Automatic system, was reliable at 500 to 800 words per minute. Thus we see that as early as 1870, ways and means had been found to increase the practical transmitting power of a single wire from 40 to 50 times greater than the average speed of the Morse system, and more than 20 times greater than the highest speed of the Stearns Duplex, of 1872, in which Mr. Buckingham and his Company take so much pride.

Mr. Buckingham's explanation of this apparent *overlook* would probably be that the Automatic system, which was subsequently bought by Jay Gould and manipulated by Gen. Eckert, failed; but the *great fact* did not die, and it was then proved that a single wire could be made to transmit 30,000 words per hour, as against 1,200 words by the Morse, and 2,400 words by the Duplex, per hour.

This wonderful "Automatic system" was transferred to the W. U. Co. in 1877, but not a cent nor an hour have been expended upon it since that time, while they continue to

obscure the heavens by multiplying wires over every railway and post road in the United States.

Mr. Buckingham refers to the electro-chemical system of Bain, in 1850, as the first of several failures of electro-chemical automatic telegraphy to compete with the brain and hand method of the Morse system, and mentions that the several systems which have been tried since that time have found their way to the junk shop through the medium of the Western Union Co., without any attempt to utilize any of them. But he does not mention that several months ago he accepted an invitation to inspect an entirely new system of Electro-Chemical or Machine Telegraphy, and that Mr. Anderson, the inventor, explained to him carefully and fully the methods by which extremely rapid telegraphy, exceeding even 3,000 words per minute, over a single wire circuit of 351 miles, between Washington and New York, was being accomplished, and 800 words per minute over the New York and Chicago circuit, of 1,027 miles of wire.

When the Automatic system was bought by Mr. Gould and subsequently transferred to the Western Union Co., it was not half developed, and in some of its essential details was a known failure; and the lines upon which it was used were unfit for any form of machine telegraphing; added to which it went into the W. U. Company without any guiding mind or any person of practical knowledge, in any degree competent to develop a working system. It also encountered in every Morse operator employed by the Company the most intense and determined hostility; and Gen. Eckert never made, nor attempted to make, the important improvements which the system required. Fifteen years of effort, however, since that time, on the part of the writer of this article, and his assistants, with the aid of a respectable fortune, have enabled him to effect the necessary "improvements," but which is now, practically, *an entirely new system*, as compared either with the "Automatic," the "American Rapid," or other methods by which Machine Telegraphy have been heretofore attempted.

All these improvements are founded upon and start from the great discovery made by us in 1869-'70, as to the latent but tremendous power of the conducting wire—not the trifling matter of "doubling the speed,"—which, according to Mr. Buckingham, has been the great achievement of the Western Union Co.—but increasing it forty fold, as in the "Automatic" of 1869-'70, and sixty to seventy fold, as in the Machine system which Mr. Buckingham had the opportunity of examining, in the early part of this year, as above stated.

In the latter part of the *Scribner* article much space is devoted by Mr. Buckingham to the "Automatic" system, with the evident intention of making its *wreck a warning to capitalists.* After admitting that it would work much faster than it ever did work, in competition with Morse's, or "30 times as fast," when the best actual test was only 21 times as fast, he goes on to say that "it failed in the hands of Companies having the strongest financial support, and in fact it has ruined every organization which has persisted in using it in competition with the Morse System." And referring to the Automatic system of the "American Rapid Co.," which the writer organized in 1879-'80, to test the improvements which he had made on the "Automatic" of 1870, Mr. Buckingham says, "it contained many valuable improvements," and among others "a transmitting speed of 2000 words per minute." Now, the "Rapid Co." never claimed such a speed as possible over any ordinary circuit, and in practice never averaged over 600 words per minute between New York and Boston, 250 miles, and were unable to work at even one-half this speed between Washington and Boston, 500 miles, with compound wires of 5 ohms per mile resistance. Mr. B. finally gives the "Rapid Automatic system" his benediction in the following words: "but at one speed or another, with good wires or bad, the Automatic system seemed equally potent to break down any company attempting to use it." It is to be confessed that the Rapid Telegraph Co. was a financial failure, and that the Automatic Company was sold out and that they both went the

## AUTOMATIC TELEGRAPHY.

Mr. F. P. Hotchkiss, an old time telegrapher of the W. U. Tel. Co., Chicago, Ills., who has been in the business some 30 years, has recently invented an automatic telegraph system which promises to revolutionize the Wheatstone, now in use by the Western Union Co.

He, with Wire-chief Kissinger, of the W. U. Tel. Co., Chicago, and a few others, have organized a stock company with a view to introducing the invention and having it adopted either by a new or the existing telegraph companies. A feature of his invention is that it requires the best of Morse operators to manipulate it and if adopted will create a demand for talent that we have not had for years.

Briefly, the idea is for an operator to transmit on a short circuit; the dots and dashes so transmitted being cut out on a strip of paper by a blade attached to the sounder in the short circuit. This paper is propelled through rollers by a small motor worked by a storage battery. The cut paper is then run through another set of rollers and made to pass over the dulled point of a transmitting stylus which drags into the cut Morse characters closing a local circuit, which can easily be arranged to work into either side of a quadruplex or a single wire at any speed. At the distant end it can be copied by an expert typewriter, or, if too fast, can be turned into a receiver, that will cut out the Morse characters on tape, which can be run through short circuits at a slower rate of speed and copied by Morse operators. The apparatus can also be attached to the receiving side of the Wheatstone and the tape afterwards run through automatic short circuits, enabling operators to copy it by sound, a scheme far preferable to the present tedious copying from the Wheatstone tape.

The electric light and motor business has all been developed since the Centennial exhibition of 1876, when the only exhibits of this kind were a couple of Gramme dynamos and a few expensive arc lamps run by clock work, and of no practical use. Yet, to-day, according to the report of the President of the American Electric Light Association, this country has \$510,000,000 invested as capital in these industries. The arc and incandescent systems of lighting appear to be about on a par. There are 237,017 arc lights in the United States, and 2,704,768 incandescent. As one arc light is the electrical equivalent of nine or ten incandescent lamps, the energy represented in the two systems is very nearly equal. The electrical railroad business is evidently growing, as the President reports 109 roads in operation, using 775 miles of track and 936 motor cars; but this is believed to be only the beginning of a much greater development of this branch of electrical work.

The Edison Lamp company of Harrison, N. J., has recently assumed entire control of the business in small incandescent lamps and those of low voltage made under the Edison patents. The varieties of lamps made will include those for physicians, experimenters; etc., and the company will pay great attention to the use of their lamps for decorative purposes wherever current can be obtained from stations or from isolated plants. W. H. Meadowcroft has this department under his supervision.

Three miles a minute is the speed said to have been attained at the trial of an electro-automatic motor in Maryland a few days ago. The system is intended only for the transmission of light express packages, mail matter and newspapers. One thing certain, if it should turn out to be practicable it would greatly aid in expediting business and add in a thousand ways to the conveniences of life.

## A MAGNIFICENT FERRYBOAT.

A new ferryboat, the "City of Reading," was placed in service on the Delaware River, July 25, as a part of the Reading Railroad's Atlantic Line. This boat was built by the Harlan & Hollingsworth Company at Wilmington, Del. It contains all the latest improvements in machinery and conveniences, and is an exceedingly handsome piece of river architecture. The exterior part of the boat is beautiful, being painted in colors especially selected by President Austin Corbin, terra-cotta red, relieved with cream tints and profusely ornamented with gold leaf. The interior decoration and finishing is also very striking. The sides are lined with polished sycamore and cherry, and the ceilings are artistically paneled and frescoed. The boat has steam-heating apparatus and is lighted throughout by electricity, the Edison incandescent system being used. This is believed to be the finest boat on the Delaware River.

Mr. H. L. Shippy, secretary of John A. Roebling's Sons Company, and Mr. J. H. Seymour, president of the Clark Electric Company, have been named with others by the Board of Trade and Transportation as proper men to be appointed by the Mayor on the International Exposition Committees.

Mr. W. A. Vail, the well-known and successful telephone manager, has resigned the general superintendency of the Metropolitan Telephone Company of this city, to accept the position of general superintendent of the Boston Super-Heated Water Company.

A train of freight cars arrived at Vancouver, W. Territory, recently, with forty miles of cable, consigned to Bartholomew & Baker from the Bishop Gutta Percha Company, New York. The cable is to go to the Hawaiian Islands.

Several accidents from the explosion of mineral oil lamps having occurred in railway cars in Buenos Ayres, the Government has given directions that hereafter all railway cars are to have electric light fittings.

The Electric Club has selected Theodore N. Vail, of 18 Cortlandt street, and Henry C. Davis, of 32 Nassau street, as representatives of the electrical profession to be appointed on the World's Fair Committee.

D. W. Edgecomb, a well-known New York patent lawyer and electrical expert, has gone to Europe with a woman he is said to have married, leaving his first wife and a family behind him.

The news of Chinatown in New York is affixed to a big telegraph pole, and the residents are much alarmed at an order of the removal of poles from the streets.

The French Government has decided to take the telephone service into its own hands, and not to grant concessions to private companies.

The stockholders of the People's Telephone Company had to call in the police to preserve order at their annual meeting in Camden.

Telegraph poles in India are made of iron, on account of the destruction of wooden ones by the white ants.

Raleigh, N. C., papers place the value of Cade's Railway Telegraph at \$320,000.

RETURNED FROM EUROPE.—W. D. Sargent, E. J. Hall and E. J. Hall, Jr., General E. S. Greeley, E. M. Barton, all well-known electrical people, have returned from Europe.



## THE POSTAL IN THE SOUTH.

The Postal Telegraph-Cable Company's lines and offices will soon be at work throughout the South, and the people of this section will then have the advantage of a genuine competing line, with a quick, thorough and safe telegraphic service. The new poles and the heavy copper wires of the Postal are attractive features in Richmond, and the Postal company has leased a fine building in the business heart of the city for its local and general offices in the South, which are furnished with every appliance for the prompt transmission of business and for the convenience of the public. The receiving, delivery and money order departments for home and foreign business are distinct and complete in their perfect office arrangement. The operating rooms are supplied with handsome new tables and the best and most improved telegraphic instruments. A neat, cosy little room is assigned for newspaper correspondents to write their special despatches. These new offices were opened to the public July 10. General Superintendent Kates says "Galveston, New Orleans and other leading cities in the far South will be the terminal points. Beginning with Richmond, we will open in Petersburg, Norfolk, Raleigh, Columbia, Augusta, Atlanta, Rome and Birmingham. Our aim will be to give the public a quick, correct and reliable service, superior even to that given by the late Southern Telegraph Company, which gave great satisfaction throughout the South." About August 16 offices will be opened at Petersburg, Va., Raleigh, N. C.; Columbia, S. C.; Aiken, S. C.; Augusta, Atlanta and Rome, Ga., and Birmingham, Ala.

In Milwaukee a some time ago a newsboy had been engaged to carry a report to the *Sentinel* office. At 1 a. m., when the operator begins to look for the welcome "G. N.," the kid was given two sheets and told to hurry back, as he would have to get "30" before going home. He failed to return to the office and the operator had to deliver the rest of the report himself. In explaining the matter to the manager the next day, the boy said that when he left the office he had only had 15 sheets, and as the operator told him he would have to get 30 before going home he thought it would be morning before he got through, and he didn't want to stay up all night.

James W. Queen & Company, of Philadelphia, report the sale of a bill of goods amounting to \$4,000 to Princeton College for the equipment of a laboratory in electrical engineering. The list embraces several of Queen's large Wheatstone bridge sets as devised by Prof. Wm. A. Anthony.

A reader wants to know why the ladies don't like the telephone better. We will tell you. It is because the man at the other end can get in a last word and hang the instrument up before she can reply.

President Harrison gave a telegraph messenger boy a silver dollar at Philadelphia a few days ago. He saw the boy run and was so astonished that he parted with a dollar almost before he realized what had happened.

A telegram from the City of Mexico says: "It is stated that the telephone company will remove its poles and place its wires in cables, 50 wires in each, and hang them on hooks from the roofs of houses."

W. U. Telegraph Co.'s receipts for week ending July 13 were \$234,582 against \$222,997 for week ending July 14, 1888, an increase of \$11,585.

John W. Aydon has been re-elected Superintendent of the Fire-Alarm Telegraph in Wilmington by the City Council.

## SPIRITUALISM'S NEW WRINKLE.

TELEGRAPHIC COMMUNICATION DIRECT FROM THE OTHER SIDE OF THE JORDAN.

On a stairway at No. 184 William street is nailed a sign "Celestial City Up One Flight." This seemed to be a short cut to this desirable locality, and a *World* reporter started up to pay his respects. The Celestial City proved to be a small newspaper lately started in the interest of Spiritualism. Two compositors were at work setting the type of the paper. Two editors were sitting at desks, writing, and the third editor was out of town. "Where we differ from other Spiritualistic journals," said one of the editors, "is in being able to receive direct telegraphic communication from the spirit-land. This gives us a great advantage, as we can and do receive special telegrams from Shakespeare, Grant, Washington, McClellan, Greeley, Lincoln and other distinguished persons." The gentleman produced a copy of his paper, and beneath the editorial head was printed a list of special contributors, among them the names mentioned and many others. The telegraph instrument was shown the reporter, but the chief editor and financial backer of the paper, W. O. Innis, was out of town, and he was the only person who could get good results from this occult telegraph, as it is called. Only a few numbers of the paper have been printed, but each number contains special telegrams, to which are affixed the names of distinguished dead. Here is one from Grant:

"I come merely to give a word of cheer and encouragement. The land has been picketed; now wait awhile; the victory will be at hand. Four! U. S. GRANT."

Bill Shea sends about two hundred words. He says he was a noted poker-player, and was well known all over the country. He says he is happy. The paper keeps standing on its editorial page the announcement that it is the "only Spiritual journal that receives and publishes communications, essays, etc., from spirit correspondents by means of sealed envelopes."

The gentleman in charge was asked how the messages were received. He said an inquiry was written on a slip of paper addressed to a deceased person, the paper was folded up unseen by the operator and then thrown into a common match-box. Immediately the telegraph instrument ticked off the reply. The paper publishes a cut of the building in which it is printed, showing three telegraph wires reaching down out of the clouds and entering the window at the editor's desk. So far all the messages have come prepaid.—*New York World*.

Messrs. Gebbie & Co., 700 Chestnut street, Philadelphia, whose advertisement appears on another page, has placed before our readers a book which should receive a good sale, by reason of the subject of which it treats. Electricians are engaged in fathoming the depths of the mysteries of electrical phenomena, and intricate problems and interesting reading are eagerly sought after for the hidden meaning there may be in them. There is no subject today as interesting as "electricity," and any attempt to explain away certain phenomena will be read with interest. The author of "Babylon Electrified" has written the book to illustrate the accomplishments and possibilities of electricity applied to mechanics.

On the Fourth and Madison avenue surface car lines of New York ten cars of the Julien Electric Storage System were started yesterday. This is the largest number of electric cars ever placed in operation on a surface road. Col. Hain, manager of the elevated railways, is president of the Julien Company.

The State authorities are finding it difficult to persuade any of the officials to touch the electric button in case criminals are to be executed by electricity.

CONTINUED FROM PAGE 11.

way of many other Telegraph Companies, into the hospitable hands and the early graves provided by the Western Union Co. The capitalists who assisted to nurse these babies into a brief existence were only too eager to realize what they could by profits on contracts, by positions for their friends, who being unequal to the struggle for existence in the callings that they were brought up to, such as bankers' clerks, shoemakers, &c., were installed in the telegraph business as managers, line-builders, &c. The gentlemen in control were more anxious, too, at all times, to sell their controlling interest to the Western Union Co. than to pay the proper attention to the development of the system, even with such tools as they had chosen to supplant the authors of it.

The "Automatic system" of 1870 was sold out to Jay Gould for \$4,000,000, and the party in control who made the sale gave full possession on receipt of \$100,000 for his personal interest, and fled to Europe, where he has remained ever since. No part of the balance was ever paid, and all of the other stockholders were defrauded of their entire interests. But the system is not to blame for this, and though it is "Automatic" by name, it is not sufficiently automatic by nature to establish itself in opposition to operators, officers and owners; and because it has not done that, Mr. Buckingham, serving as coroner, decides that it died a natural death; and as "chief electrical expert of the Western Union Co.," he sits in judgment on the Automatic systems of the past, present and future, and pronounces them all failures, and predicts disaster to capitalists who may have the temerity to assist the people to obtain what we all know they greatly need, viz.: a cheap and rapid system of telegraphy; by which is meant, instantaneous transmission of 500 to 1000 words per minute over every circuit between the Atlantic and the Pacific Oceans, at rates of tariff admitting the transmission of ordinary business letters at 25 to 50 cents, from all and to all points in the United States.

This is precisely what "Machine Telegraphy of To-Day" means, Mr. Buckingham to the contrary notwithstanding; and as the many, in this free country, are greater and more powerful than any obstructive organization or monopoly by a few, that it will come there can be no rational doubt.

The "Automatic" or Machine System has, at last, been perfected. It is beyond the possible control of the W. U. Co. It has been thoroughly tested and it only waits to be set in operation by honest capitalists who will set it in motion fairly and with as much attention, at least, to the system as they give to the approach of some one to buy them out.

In describing the Wheatstone system, which is an antique English invention, used in England thirty years ago, and introduced into this country by the late President Orton of the W. U. Co. in 1869, which is now used by the Western Union Co. to some extent, and which possesses all the more objectionable features of the "Automatic system" which Mr. Buckingham has so vigorously condemned, he asserts with surprising boldness, but without even the shadow of truth, that the "Wheatstone system possesses advantages over the electro-chemical-automatic system which are indispensable to a successful system." He adds, "In the Wheatstone repeaters, which serve to convey transmissions from one circuit to another, without manual aid, may be employed, as is done at four points on a line 2,600 miles long, from Chicago to San Francisco, while in the electro-chemical system this is impossible; and for this reason alone, to wit: because the automatic or electro-chemical system is not practicable upon lines of the greatest length, where it would be more useful." "Moreover," continues this expert romancer, "the record when made in ink marks is far more reliable than when formed by electro-chemical discolorations on moistened paper, for, in the latter case, the tendency for dots and dashes to become blended into a continuous line is marked."

Now, while there is a grain of truth in these remarks, as applied to the various systems which the Western Union Co. has absorbed and transferred to the "junk shops," in the "Machine System," which was shown to Mr. Buckingham, he was

taught, though, perhaps, he did not learn, that it is better adapted to Duplexing than the Morse is, and that with a proper automatic Repeater at Washington, on a 351 miles of wire circuit from New York, 900 words per minute, from the New York office, were perfectly repeated at Washington, without manual aid; and on the New York and Chicago circuit, of 1,027 miles, 600 words per minute, telegraphed direct from New York, were repeated perfectly from the Chicago office back to New York over another wire in the most perfect manner.

With the Machine system connected with a proper wire and battery it is wholly improbable that it would be at all necessary to introduce into the New York and San Francisco direct circuit over three Automatic Repeaters to carry 500 or 600 words per minute, in all weather, over each wire. But the system is capable of working a dozen Repeaters, in any desired circuit, at pleasure. This improved "Machine System" is also provided with an Automatic Ink Writer, which responds perfectly at 600 words per minute, in long or short circuits. This improved system also records at pleasure upon a half-inch paper ribbon, or in lines and pages, of the size of letter paper,

All the mechanism is very simple, and is less expensive than that of the late Rapid Co. by fifty to seventy-five per cent., and is probably twenty times more durable, and many times less expensive, and immensely more rapid and reliable than the much-boasted but antiquated "Wheatstone System."

There are two forms of perforators for the "Machine System"—one for business men and one for telegraph offices—by which twenty and fifty words per minute, respectively, can be prepared for instantaneous transmission, which completes the requirements for extremely rapid, economical and reliable telegraphing.

The "Machine System" has overcome all the illegible recordings, tailings and other difficulties arising from static retardation, induction, etc., etc., which Mr. Buckingham ascribes to the several automatic electro-chemical systems that he seeks to bury in a common grave; and now, with proper wires and batteries, these effects are never experienced to any appreciable extent in line circuits of even 1,000 miles or less. When very much longer circuits are desirable the worst that happens is a reduction of speed from 2,000 to 1,000 or 500 words per minute, according to the quality of the wire and the length of the circuit.

D. H. CRAIG, *Manager*.

5 DEY STREET, New York, August 13, 1889.

#### PROGRAMME OF OLD TIMERS AND U. S. MILITARY TELEGRAPHERS' MEETING.

SEPTEMBER 11, 12 AND 13.

U. S. Military Telegraph Corps and Old Timers' Reunion—the ninth—will take place at Louisville, Sept. 11, 12 and 13, 1889. Headquarters will be at Louisville Hotel, Main street, between 6th and 7th. \$2.50 to \$3.50 per day, according to location of room.

PROGRAMME—Sept. 11th.—The business meetings of the U. S. Military Telegraph Corps and of the Old-Time Telegraphers' Association will be held in the parlors of the hotel. The meeting of the Military Society will be at 10 a. m. The meeting of the Old-Timers at 2 p. m. Banquet at the hotel (\$5.00 per plate) at 8 p. m.

Sept. 12th.—8.05 a. m.: Leave L. & N. Depot for Mammoth Cave (distance, 100 miles). 1 p. m.: dinner, Mammoth Cave hotel. After dinner, exploration of the Cave, returning to the hotel for supper, after which the usual stories of war and old times. Mammoth Cave trip, including railroad fare both ways, hotel bill and guide fees, about \$6.00.

Sept. 13th.—8 a. m.: Homeward bound, arriving at Louisville, 11.40 a. m., stopping over for general hand-shaking and for cheers and a tiger to our Louisville friends. Chas. Smith, manager Western Union Telegraph, Louisville, Ky., is chairman of the Committee on Arrangements: please notify him as early as possible whether you will be at the meeting.

JAMES E. PETTIT,  
Secretary U. S. M. T.

WM. J. DEALY,  
Secretary O. T. T. A.

## THE HEISLER PATENT SYSTEM

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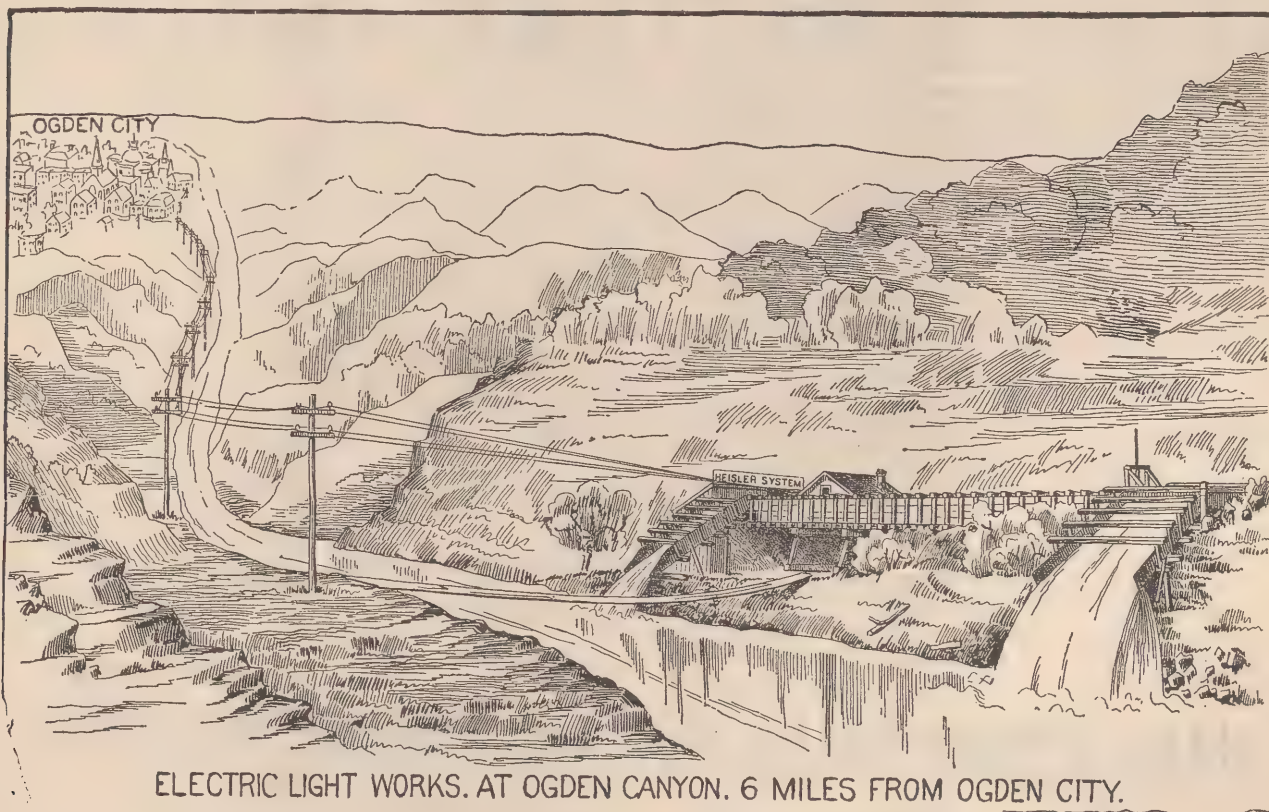
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SAFETY, RELIABILITY, and FINANCIAL SUCCESS FULLY DEMONSTRATED.



ELECTRIC LIGHT WORKS. AT OGDEN CANYON. 6 MILES FROM OGDEN CITY.

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*Greatest Production of Candle Power per Horse Power. Dynamo self-contained and perfectly Automatic.*

**SEND FOR CIRCULARS.**

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HARD RUBBER \*  
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*Manufactured under KIEL'S PATENTS FOR STORAGE AND  
PRIMARY BATTERIES.*

*Unequaled for STRENGTH, DURABILITY, RESISTANCE  
to acids and INSULATING PROPERTIES.*

CHEAPER THAN ANY CELL IN THE MARKET.

**HARD RUBBER SHEET, ROD AND TUBING.** (Kiel's Patent.)

Adapted to ELECTRICAL PURPOSES at a considerable  
REDUCTION FROM STANDARD PRICES. Hard Rubber  
electrical goods of every description manufactured. Correspondence  
solicited from all manufacturers of electrical machinery and appliances.

**SEND FOR PRICES AND ESTIMATES.**

## NOTES.

UNITED PRESS NOTES.—Mr. E. A. Sprong is on a vacation of one month at Shippensburg, Pa. Mr. R. G. Morris, of the *Sun* bureau is in Columbus, Ohio, sick. A. S. Ayres and M. H. Crane alternate as substitutes in Sprong's absence. Mr. S. S. Scandlon is again at work. Mr. F. C. Mangin is on a vacation.

WATERVILLE, IRELAND, NOTES.—The Fourth of July was observed at the Commercial Cable Company's station at Waterville with the usual enthusiasm, and the occasion was seized on which to hold the annual Athletic Games. Representatives from the "Direct" and "Anglo" Companies participated in the exercises with the Commercial Company's staff. The weather was most delightful and the number of entries large. About 2,000 people were present. The arrangements were under the immediate supervision of Thomas J. Wilmot, the popular superintendent of the "Commercial," who, during the sports, was the recipient of a prize not down on the list. Mother and boy doing well.

MILWAUKEE, WISCONSIN.—The Milwaukee telegraphers defeated the Chicago boys for the fifth consecutive time Sunday, Aug. 4, at Athletic Park, by a score of 17 to 12. The following gentlemen composed the Chicago nine: Mullen, p; Ledsworth, c; Carr, 1b; Pierson, 2b; Hazlett, 3b; Smith, ss; Gubbins, lf; Cadore, rf; Gillen, cf. Milwaukee: Hobdy, p; Addis, c; F. Worth, 1b; W. Ramsey, ss; Andrews, 2b; Williver, 3b; Walsh, lf; Hickey, rf; J. Ramsey, cf. Among those who accompanied the players were Messrs. McGill, Waters, Howard, Lysaght, Kane, McChesney, Lyons, Percels, Spafford, Wangeren and many others. The return game will be played in Chicago some time next month. E. H. Lee has gone East on a short vacation, and on his return will be with the W. U. W. C. Williver succeeds Mr. Lee as night operator for the U. P. at the Seebote. Ald. Ramsey, manager of the Postal, was a member of a committee appointed by the Mayor to visit a number of eastern cities to inspect the different systems of electric railways. He was one of the Milwaukee aldermen who turned the hose of the fire tug on a yacht in Boston harbor, and precipitated several of the crew into the water. We all extend our heartfelt sympathy to Chief Operator Smith of the Postal, whose four months' old child died very suddenly on the 2nd inst.

MEMPHIS NOTES.—Miss Jennie Davis and Mr. Sam Chancellor have just returned from vacations, and are very much pleased because they both received notice that their salaries would be raised on their return. Several others have enjoyed a similar experience lately. Late arrivals, Mr. Morris, Nashville; Mr. Wade, New Orleans; Mr. Hogshead, Meridian, Miss.; L. W. Carrington of the Assd. Press and wife are spending the warm spell in the Blue Grass region. Mr. Brewer from Cincinnati relieving him. The sympathy of friends is extended to Mr. Cris Reilly who lost his child a few days since. Miss Portia M. Brooks of Memphis, has been appointed manager of the Helena Ark. W. U. office. Miss Brooks is one of the youngest lady operators in this part of the country, but she holds her new place down as though she had been in the business several years instead of a few months. We wish you success.

NEW YORK CONSOLIDATED EXCHANGE NOTES.—Thomas Wiseman has been added to the W. U. force. The Postal force consists of two men and a manager, David Brann having been transferred to the main office. F. E. Wilcox is the manager with R. H. Busby and Ed. Kenny operators. The W. U. still retain their old force of five operators, the manager and two clerks, notwithstanding the extreme dullness of the oil market. Mr. Fred. Simmonds is

the able and popular manager. His assistants as operators are Richd. Kane, John Costello, J. E. Hoey, J. V. McCrohan and Thomas Wiseman, and clerks, J. C. Ashby and Jas. Cotton. Some time ago an American cable to Canso was run into the Exchange over which firms scalp between London and this exchange. Mr. D. J. Mackenzie works the wire. The office now remains open all day. It was formerly closed at 2.30 p. m. Mr. F. E. Finn is still the C. N. D. operator. The telegraph offices which were clustered together near the Broadway entrance have been separated. The Postal now is on the New street side directly opposite the W. U., which adjoins the C. N. D. booth. The Quotation Ticker Company, which the exchange controlled, have a booth in the centre of the stock crowd. Mr. W. H. Germaine is their operator. Mr. P. J. Tierney attends to the black-board ticker wire. A. J. Smith works a private wire. Marcus Heim, one of the prosperous brokers, was once a telegrapher.

KANSAS CITY NOTES.—Among the recent arrivals are P. J. Dalaney from Chicago; Messrs. Sanderson and Pollack, Springfield, Ills.; Messrs. Keller and Staley, Postal; R. A. Evers, St. Louis; M. F. Evers, Sedalia, Mo.; Mr. Dickey, Chicago, and Messrs. Fields and Bob Maynard from Brookville. Departures: J. J. Chaddick to St. Louis; Harry Bender retiring, and Messrs. Bartlett and Hunter to Chicago. Mr. W. Marshall and John Bowman left here on the first. The Wheatstone is being enlarged to accommodate the fast growing business. Chas. Howard, Albert Thomas, W. Wood and the Misses Sharon, Lovelace and Cook are spending their vacations at their respective homes. Mr. H. J. Dunn, the assistant night chief, recently returned from a month's visit to New York and the seashore. The Circulation of the AGE is very large in this city and is well liked by all. Messrs. Thomas, Cody and Ferris have been on the sick list.

ST. PAUL, MINN. NOTES.—Among the recent arrivals are Messrs. Hammond and Cranley. The office has been newly painted and cleaned and some rules put into effect which has the tendency to better the ventilation. Mr. Edworthy had gone to Winnipeg to copy report for the C. P. R. Business is booming here now and extra is at its highest fever. Mr. Rockwell is at the *Pioneer Press* office, and Mr. Smith looks after the affairs at the *Globe* office. Harry Talcott has charge of the race department at the fair grounds and it is needless to say, business is handled promptly and accurately under his supervision. Tony Dapron recently completed the building of a pretty cottage which he now occupies. Mr. Bohannon Betts, has gone to San Francisco. All are sorry to part with Mr. J. E. Bell, who leaves soon for Nicaragua to enter the government service.

DALLAS NOTES.—The weather in this section has been extremely hot and oppressive, and there seems to be more laying off and recuperating this summer than ever before. Quite a number of the force here are in the North and East visiting friends and relatives and others intend doing the same as soon as they can be relieved. Jas. C. Langley and W. L. Moore, delegates to the O. R. T. Convention have just returned from an extended visit through Ohio and Kentucky. R. C. Watson, Fred. Rockwall, and O. P. Haney are off on leave of absence. Henry Stanbery, an old timer, left us last week for New York where he expects to while away the time at 195 during the hot months of August and September. The latest arrivals are: C. A. Worrall, from T. & P. R'y; W. E. Webb, Santa Fe, N. M.; L. C. Steddum, Yacatecas, Mex.; E. C. Lyon, Galveston, and C. A. Read. Departures: Albert Lucas to T. & P. R'y, F. C. Barr, Lima, Ohio, "Peg" Fisher, Sedalia, Mo. Operator Jim Bean, at the Purdy and Randall race pool room, is considered to be the best posted man on horse-flesh in Texas. Good men are in demand in Texas just now.

**TORONTO NOTES.**—Mr. Louise Peine of the C. P. R., New Hamburg, has just returned from a two months' trip to the Pacific coast. Miss Mary Cassel managed his different branches of business during his absence. Mr. E. E. McManus, assistant chief of the G. N. W., Toronto, Ont., was quite ill recently. He is now convalescent and will resume his duties shortly.

**FREDERICK, MD., NOTES.**—Business has been very brisk of late. The encampment of the State Guards has kept our very popular manager, W. M. Crimmins and his able assistants, Kemp Keefer and Harry Blackstone, very busy. At the P. R. R. we find the genial C. F. Schroeder in charge. Mr. W. E. Schroeder takes care of the B. & O. business at Frederick Junction nights, and Ed. Halley days. J. A. Cahill of New Brunswick, N. J., arrived here a short time ago to take charge of a broker office.

**CHICAGO WESTERN UNION NOTES.**—For the last two weeks P. L. Teeple, Senate Deputy of the National Union, has been securing signatures for the formation of a Telegraphers' Council of the National Union, and on Saturday evening, August 3d; the first meeting was held in Lincoln Hall, National Union Building. The result of Mr. Teeple's labors showed that nearly 150 operators signified their willingness to become members of the council. The charter was ordered, by a vote of the council, to be held open until August 17th, to permit others who may wish to join as "charter members" to affix their signatures to the document. The list of names to the charter contains some of the most prominent Western Union and of Postal Telegraph men of Chicago, as well as superintendents telegraph of some of the principal railroads centering in Chicago. W. J. Lloyd, assistant superintendent of the Western Union, suggested that the council be called "Morse Council," which was unanimously and enthusiastically adopted. The following officers were elected:

President,	P. W. Drew;
Vice President,	M. McCulloch;
Speaker,	A. W. Graham;
Ex-President,	John F. Steveley;
Secretary,	F. J. Scherrer;
Financial Secretary,	Henry Behl;
Treasurer,	R. L. Boyer;
Chaplain,	A. E. Terpenning;
Usher,	N. M. Kent;
Sergeant-at-Arms,	H. D. Ward;
Doorkeeper,	W. M. Marr;
Trustees:	{ S. C. Mason, H. W. Plum, and J. C. Henderson.

Last Saturday thirty-five of the boys visited Milwaukee as the guests of the Milwaukee operators. Nine of the Chicago men played ball at the Milwaukee Park with nine of the Milwaukee men, the Milwaukee winning 17 to 12. After the game the visitors were dined at Schlitz Park and had an enjoyable time. The trip to and from Milwaukee was made by boat and thoroughly enjoyed by all. Mr. A. L. Baker has just completed a very large and handsome chart—5 x 5—for the city lines, showing delivery limits for every office. It is an elaborate piece of work and is an ornament to the City Line Department. A few of the recent arrivals are: Messrs. Munz, Omaha; Hyde and Appleby, St. Louis; Wendover, Cleveland, and Pearce, Logansport. The Anderson boys have returned from a vacation looking well. Frank McLoraine has returned to his desk after an extended absence owing to illness and is looking much improved. Harry Burton has returned from a seven weeks' vacation, part of it enforced, as he was camping on an island up the lake and could get no boat on which to return. We were glad to see him. Mr. Lew. Marston has the sympathy of the force owing to the recent death of his mother in this city. Mr. C. M. Robuck, who has been ill for some time, has returned and is on the 9:15 split trick. Traffic chief Dalton and C. J. Malloy are on the sick list.

Miss Bessie Weiser is relieving Mrs. Dutton at a broker's office. Miss Annie White has returned from a trip East.

**BOSTON NOTES.**—The busy season is in its zenith here, and the "scoopers" are growing rich rapidly. It is said of one night man that he has used up all the "extra" slips; this the man himself claims is a mistake; it is all the "special" blanks he has used. But setting aside such jokes, the night men are working hard and faithfully, and can be relied upon in all cases of emergency. Quite a number of such cases are occurring just at present, so the night men are omnipresent. At the recent examinations held at the Harvard Dental School, night manager Pond and Chester Clinch were candidates for the third and last year's course. They both passed the examinations successfully, and are now full fledged dental doctors. They have opened offices and are establishing a good practice. Fraternally speaking, they are both good fellows, and we can wish them no better success than to hope they will make their new profession as good a success as they have their old. They are deserving, and we hope they will obtain the patronage of the fraternity. Mr. Clinch has already resigned. The Lowell W. U. office has gained a marked reputation for the matrimonial fever. Six young ladies have successively been married from there within the past few years, the latest being Miss Eliza Mahan, now Mrs. Murphy, a well-known and popular young lady. Mr. and Mrs. Murphy will make their home in Arizona; they have our heartiest congratulations. Some new improvements are being made in the sanitary condition of the building here under the supervision of the veteran janitor Joe Martin. These improvements were much needed, especially in the City Line department, and when the repairs are completed this department will be a more inviting place to work in than it has been heretofore. It would seem that the expense incident to the repairs which this old building has to undergo now and again would go far in fitting up a new office, but, like the old French philosopher, we hate (?) to see the "old post" pulled up. The increased size of the AGE in the last issue was cheerfully welcomed here. Mr. Editor, let the good work go on. We all read the AGE here whether we pay for it or not. The fact is we are anxious to learn what is occurring in telegraphic circles, and as the AGE furnishes such news in general, we have either to buy, borrow or steal it. Owing to the recent effective arrangement the latter cannot be indulged in, and many are loath to practice the former, so the only course left for non-subscribers is to borrow. Thos. R. Finan and Wallace C. Cox, both of the Portland quad, were sent to attend to the interests of the W. U. at the recent dedication of the Pilgrim's Monument at Plymouth, Mass. Miss Susie C. Hay, chief of the ladies' department, has returned from a month's vacation in Nova Scotia. During her absence her place was very acceptably filled by Mrs. Culling. Mr. Rudolph Boyle from the Postal has been assigned to the first New York. Mr. J. A. Herrick, of the test wire and error department, has resigned on account of ill health and will leave immediately for the Far West to recuperate. The report of C. L. McKee's death in the New York item of the AGE, August 1st, was read with surprise and regret. Mr. McKee was well known here, having been a member of the all-night force for two or three years. Messrs. Clark and Hutchinson, sergeant and corporal of the Ninth Regiment, go to muster August 13th. Arrivals up to date are as follows: Jas. J. Collins, M. U., city; W. J. Ryan, Montreal; H. R. Lovejoy, W. R. Jct., Vt.; P. S. Carey, J. J. Sullivan, D. J. Connell and E. L. Hackett. Departures: Messrs. McLaughlin, Fallon and Williams; also Mr. J. J. Ormond, who goes to Bar Harbor for the W. U.

**C. P. R. NOTES.**—The fourth annual excursion under the auspices of the C. P. R. Library, at West Fort, occurred Tuesday the 30th ult. The day was an exceptionally favorable one and combined with excellence of management caused this picnic to be perhaps the most successful one ever given. The Secretary, Mr. J. S. Hunter, Chairman Phipps, and the

whole Committee of Management had arduous tasks to perform, but so complete were their arrangements, that not a single hitch occurred in the numerous events which were announced to take place. The engine was gorgeously decorated with evergreens, flowers, and red, white and blue bunting. On the front part of it was the legend "The fourth annual excursion," very neatly worked in evergreens, in the centre of which was a crown traced in gilt, the work of the Misses Phipps. The whole was surrounded by Union Jacks. The party was augmented at Fort William and West Fort, and by the time the contingents from Murrillo and Kakabeka were aboard, the number reached over a thousand; a special car from Ignace brought about 100 more. On arriving at the grounds no time was lost in starting the games, Mr. Neil McDougall, Port Arthur, filling the office of "starter" with his usual ability, the judges being D. W. Mitchell and D. McDonald. Many of the events, such as the wheelbarrow, sack, three-legged, and woman races, caused much merriment. The judges of the prettiest baby had no unenviable task. The tug of war took place on the track just before the train started homewards, and was easily won by Fort William. The dancing platform was well patronized all day, the orchestra being under the charge of Mr. Whitcomb. The Port Arthur brass band which accompanied the excursion added considerably to the enjoyment of the day; the train moved out of the town to the enlivening strains of "The girl I left behind me" (by the way, there weren't many left behind). The following operators were conspicuous, some of them participating in and carrying off prizes, of which there were many, to the value of \$400: Despatcher M. C. Carey, Pt. Arthur, Mr. Culleton, Fort William, Mr. Eggett, West Fort, Mr. Briggs, Buda, Mr. Wormworth, English River, Mr. Nash, English River, Mr. Sanders, Ignace, Mr. Sheehan, Savanne, Mr. King, Kaministiquia, and many others. The baseball match, was the event of the day. There was a very strong feeling displayed by the friends of the teams, and considerable betting was indulged in. Mr. D. Lawton was selected as umpire, and although his rulings were frequently and often rudely questioned, he certainly acted with the strictest impartiality. A very good and careful game was played up to the end of the fourth inning, when Fort William succeeded in getting five runs ahead, and at the end of the sixth, they stood eight ahead. As the game was a seven innings one, the hopes of the Port Arthur boys fell to 40 below zero as they went to the bat for the last time. By bold batting and running they succeeded in gradually reducing the gap, and by the time a tie was reached, the excitement was intense. They rolled up ten in this inning and thus gained a majority of two. The Fort William club was whitewashed. Such a scene of delight was never heard or seen before on the banks of the classic stream of the Kaministiquia. The score was 13 to 15. Superintendent Timmerman then appeared on the scene and closed the eventful day by calling for three cheers and a tiger for the Port Arthurites, which was given with a zest.

POSTAL NOTES.—Arrivals:—J. O. Wilson, H. G. Funk, G. F. Randolph, J. Ahearns, L. F. Farnam and W. S. Williams. Departures:—J. S. Bland, D. S. Talmadge, S. J. Wilson, W. H. Foley. Transferred:—P. Levy to Hoffman House; T. McBain to dynamo department. On vacations:—E. Rath, L. Maguire, L. Lahey, K. V. Applebaugh, J. H. Gibbons, F. E. McKiernan, T. F. Kehoe, M. McDonnell, D. F. Mallen, E. Kimmey, T. T. Cusack and M. Gibbons.

NEW YORK WESTERN UNION NOTES.—The last number of the AGE, filled as it was with most pleasing and interesting matter, elicited many words of praise as to its general make up from the hundreds of subscribers here, who rejoice to see that it is on the road to prosperity. Miss Manning is confined to her room with a fever. One of the most congenial spirits in the office is N. D. Webster, who works the Cleveland quad at night. Although the possessor of but one arm, the amount of work he can

accomplish with it is something wonderful. His right arm is amputated near the elbow; yet, with the stump, he can get as neat a balance on a quad or send as perfect Morse as any man in the business. His favorite amusements are pool and checkers, and that he is slow at neither can be abundantly testified to by such members of the club as have had the fortune or misfortune to run up against him. He is about the average height, is possessed of a clear, open, manly countenance that has won for him a host of friends, is remarkably even tempered and is one of the most faithful men on the force. His age is about 32. He is a man of very correct habits, and is a member of the Board of Audit of the New York Telegraph Club. Miss Vion has resigned, for the purpose, it is said, of teaching school. Mr. Stanbury is with us for a couple of months, at the expiration of which he will forsake the waiting list for his old position at Dallas, Texas. This is the way Mr. Stanbury spends his vacation sees the country and at the same time coins money. Miss Fletcher and Miss Clary have returned from their vacation rejuvenated in health and spirits. Misses Dougherty, Burck, Miller, Cassidy, Brown and Alberts have been assigned to the split trick. Jack Morison, one of the best known men in the business, is considerable of a wag. He amused his comrades the other night by hanging on a hook before him a blank bearing these words: "To All: I have tobacco. Line forms on this side." And every man on the force joined the procession. Miss Hall, chief in the city department, and the Misses Henderson and Hayes, are away on their vacations. Chris. Fallon, who resigned some weeks ago and went to Boston, has returned to work here. Thomas Heffren, "ring-master" on the 1 to 8 a. m. force, is delighted with his trip to Philadelphia, where he spent eight or ten days viewing the many sights to be seen there. Miss Annie Nolan, wire chief in the city department, is away on vacation. The combined weight of Messrs. George Hann, William Stewart and Frank Giles, three men employed in Chief Operator Firmin's division on the south, is 641 pounds. Miss Florence Miller, a prime favorite on the western ways, is for the summer located at Pine Hill, N. Y. Harry Reynolds, remembered by the boys of six or eight years ago as one of the best looking as well as for his years one of the best operators in the office, paid the operating-room a visit a few days ago. The change, he remarked, was wonderful to behold. Andrew J. Tierney rejoices over the arrival at his home, a few days since, of a little son. This announcement will not only surprise but please every friend in the office, all of whom know that were they to wait for "Andy," who is the very personification of modesty, to say a word about it, the child would have become of age. During the absence of Mr. Charles W. Lawton, chief of the afternoon newspaper loops, who is now on a vacation, his place is most creditably filled by Mr. A. C. Robins, one of the best "all round" men in the profession. Mr. Enos M. Barton, president of the Western Electric Company, and reputed to be one of the wealthy men in Chicago, was once employed here as an operator. Shortly after seven o'clock, a few mornings ago, a terrific clap of thunder followed by a flash of lightning that for an instant illuminated the entire switch-board, startled those whose duties required them to be there. "Great Scott!" vociferated Paul Sheehan, "that was an angry one, wasn't it?" "Yes," said a passer-by, "but from all accounts I think it too premature." "Why so?" Paul asked. "Because," was the reply, "sparking is not allowed here before eight o'clock." Walter Brant now comes on at 7.30 instead of 8 o'clock, as formerly. Miss Ida Thiele has accepted a position with Doren and Wright. Messrs. Winder, Pittman, Weir and Wark have been assigned to the western ways. Miss Nellie Carroll is subbing in a broker office for a month. Misses Frazee, Bardash

and Hogan have gone on a month's vacation. Mr. Davenport was very quietly married a few days ago to a most estimable young lady of Elizabeth, N. J. Congratulations. Mr. Lew Weller is working an extra trick night. Miss E. Adams has taken a broker office for a month. E. R. Henderson now works from 10 to 3. Miss Murphy has returned from her vacation. J. Ulrich has gone to Larchmont for a month. Miss Lizzie Malone is very sick and has gone to the country for her health. Mr. Van Horn is visiting his old home in the upper part of the State. Andrew Park has been transferred to Saratoga. The following have been appointed to the regular day force. Messrs. E. P. Porter, John Martin, Pittman, Weir, Wark, E. A. Jackson, McCauley, Falkinburg, Price, Flynn, Boldrick, Davenport, Goodfellow, Parrett and Riley. Messrs. Shreyver, Horace, W. H. Richardson, McGuire, Kuttner, E. N. Taylor, Heldman, G. A. Walsh, Charlie Minier, Bergen R. Fanning and Eugene Perkins have been assigned to the split trick. Mrs. Randolph is enjoying a much needed and well-earned vacation in the Catskills. During her absence her place is being most creditably filled by Miss Minnie Brooks. Miss Boyle has returned from her vacation. Messrs. Doherty and McCuen have resigned. P. Sullivan and M. Collins have been assigned to the regular night force. Mr. Seely's hours have been changed to 7.50 and 5.20 P. M. Miss Sadie Fellgraff, who for some time past has worked the Brooklyn wire, has resigned to accept a more remunerative position with the Postal. "Ship 15 boxes genuine bareless codfisi" is the way an order for boneless codfish passed through this office a few nights ago. Charles Schram, absent for several weeks on a vacation, has returned in excellent health. Joe Van Cura, brown as a berry and as rugged as a bear, is back from the annual encampment of his regiment—the famous Twenty-second. Night Manager Sink, under the escort of Mr. Con Meyers, paid the rooms of the New York Telegraph Club his first visit a few evenings since, and expressed his delight at everything he saw and heard there. Mrs. Sheehan, wife of Mr. Paul Sheehan, wire chief on the 1 to 8 A. M. force, while in the performance of her household duties a few evenings since, sustained an injury to one of her eyes that for a time threatened her with blindness. It is gratifying to learn, however, that her physician expresses the utmost hope of restoring her sight. M. C. Sink is back from a business trip to his former home, Utica, N. Y.

PHILADELPHIA, PA., NOTES.—Business is very brisk. Operators who are desirous of a vacation find it very difficult to get excused or to obtain substitutes. Arrivals: Geo. Silver, Miss Lizzie Mounce, Danl. Creary, John K. Ritz, D. C. Crawford, G. Nobre Harte, city; C. W. Morris, Des Moines. Printer M. G. Moyer and family are sojourning with the good people at Ocean Grove for two weeks. Mr. Geo. Wood is filling his place during his absence. Miss Conner will spend two weeks in the mountains of Blair County. Miss Shotte will rusticate on a Lancaster County farm for a few weeks. Mr. D. L. Culver has resigned his position with the W. U. at the Stock Exchange, to accept a better one with a private firm. He is relieved by D. B. Baldwin. Miss Bessie Cook has returned from a two weeks' vacation at Long Branch, looking very much refreshed. Mr. W. D. Shuster has been elected president, and John W. Benckert, vice-president of the Aid Society for the remainder of the year. J. B. Bowers and W. D. Garrison have opened a stock commission office. Miss Emma Henry, who assumed charge of the summer office at Oakney Springs, Va., writes to her friends in this city that she has wonderfully improved in health since leaving here two months ago. Miss Hussey is on a month's visit to the New England states. Geo. M. Eitemiller, of Pittsburgh, paid us a visit on Aug. 8th. Mr. Edward Bartholomew has left us to accept a position with a large coal firm at Drifton. We are sorry to lose him.

Pryor & Co. having given up their wire, Miss Mamie Gregg's services have been dispensed with.

#### NON-FORFEITABLE MEMBERSHIP IN THE T. M. B. A.

*Mr. Editor:*—That telegraphers possess wisdom is plainly shown by their management of the Telegraphers' Mutual Benefit Association, now the oldest association of its kind in America, and the only mutual benefit association that can show a record of decreasing expenses with increasing age as stated in your issue of July 1. In view of this fact would it not be wise to make some kind of an arrangement of *non-forfeitable membership* after say twenty-five years of continuous membership, with the understanding that any "non-forfeitable membership" in arrears becoming a claim against the association, such arrearages to be deducted from the \$1,000 due?

Yours truly, P. J. TIERNEY.

Mr. A. H. Bliss and family, of Chicago, sailed for Europe on the steamer *Britannic*, Wednesday, August 7th. They were called upon at the Murray Hill Hotel, by a delegation of the U. S. Military Telegraph Corps and Old-Time Telegraphers. Mr. W. L. Ives, chairman, after delivering many kind messages and good wishes, heartily welcomed the party. Mr. Bliss responded in his happiest vein. At the steamer the delegates after presenting to the voyagers a handsome floral piece, bade them adieu and bon voyage, all hoping to meet again at the Reunion of 1890.

Mr. P. F. McDermott, a well-known American operator, is now located in the city of Mexico, where he is private secretary to the assistant general manager of the Mexican Central Railway.

Mr. W. E. Peirce, the well-known Washington operator, will sail on the "City of New York" August 21st for Europe. He will visit London and Paris before returning.

Mr. Frank English, with Chas. Head & Co., will start, in a few days, with a party of friends in his 24-foot catboat for a two-weeks' cruise on the Long Island Sound.

D. S. Dunham has resigned his position with the Doran & Wright Co., New York, to accept a position as correspondent of the same company at Nashua, N. H.

T. F. McManus, manager of 1616 Third avenue, New York office, is the proud father of a young son. If you have any doubts in the matter call and see him.

Mr. E. P. Johnston, formerly of St. Albans, Vt., is now manager of the Commercial Union Telegraph Co., at Manchester, N. H.

Mr. H. C. Richardson, formerly of 195, is now with the United States Electric Light Co. of this city.

Mr. J. W. Hayes is now superintendent of the Postal Telegraph Co., Portland, Oregon.

Mr. W. J. Howey, of the 195 Broadway force, has gone o Europe on business.

DIED.—Mr. John P. O'Brien, chief operator of the Postal, at Indianapolis, Ind., died suddenly July 19th, of heart disease. Mr. O'Brien entered the telegraph business in 1878 and since that time has been employed by both the Western Union and Postal. In August, 1888, he accepted the position of chief operator of the Postal Company at Indianapolis, which position he was filling at the time of his death. He leaves one little daughter about six weeks old. Mr. O'Brien was a pleasant gentleman and highly respected by those who knew him. He was well known in Peoria and Chicago, Ill.

DIED.—Wm. Edgar Van Nortwick, of the Commercial Telegram Co., New York, died July 13, of brain fever, at his house in Hohokus, N. J. He leaves a widow and two small children. He was twenty-nine years of age.

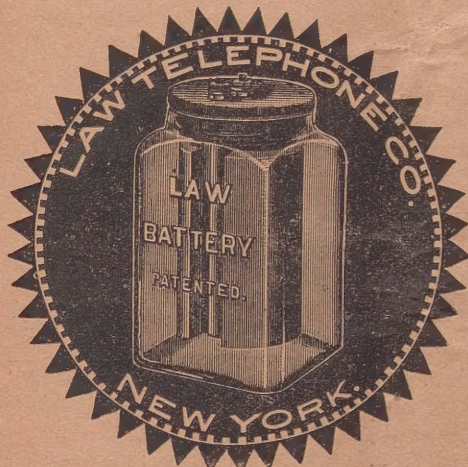


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\*.\* This translation of a new author whose "Babylon Electrified" has had a large sale in Europe, may be best described as a Scientific Romance. There is a very interesting love story running through the narrative, but the most important feature of the work is, the marvel of applied electricity. At times the style reminds us of Jules Verne, but M. BLEUNARD is not one who deals with impossibilities, but measures all his statements and results with scientific care; his situations, nevertheless, are frequently marvellous, and will, without doubt, open the eyes of many readers, in a pleasant way, to the results that mankind may soon expect from Electricity harnessed by Science. This book although written to illustrate the accomplishments and possibilities of Electricity applied to Mechanics, is the best description of Modern Mesopotamia, (the original cradle of the human race,) ever given to the public.

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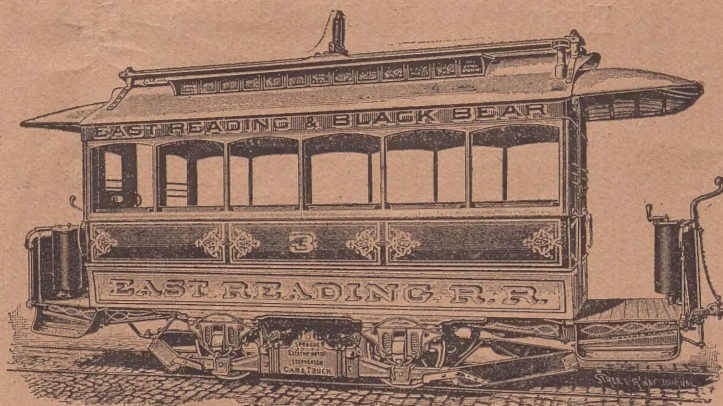
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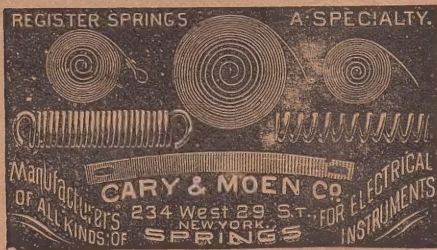
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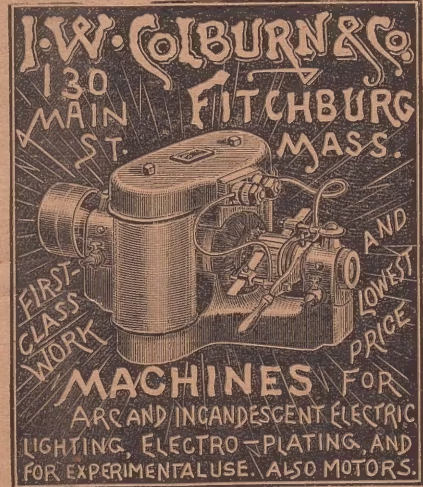
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