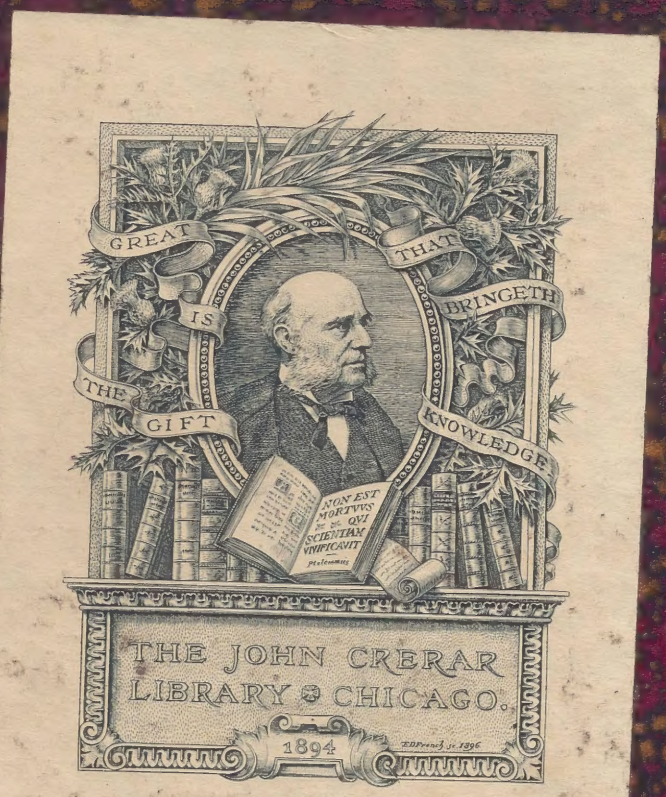
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THE ELECTRIC AGE.

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

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WALTER P. PHILLIPS, Editor.

J. B. TALTAVALL, Publisher

No. 5 Dey St., New York.

NEW YORK, JUNE 1, 1888.

THE RISE OF A GENERAL.

Mr. D. H. Bates, formerly the brilliant and efficient President of the Baltimore & Ohio Telegraph Company, has been appointed General Manager of the Electrical Accumulator Company, of which Mr. Theodore N. Vail is President. The Accumulator Company, in securing the services of Mr. Bates, is to be congratulated on the achievement. No man before the public to-day has made greater strides in a similar period of time than have been made by this gentleman in the past thirty years. He was born at Steubenville in 1843, and at the age of sixteen he entered the service of the Pennsylvania Railroad Company as an operator, at Pittsburgh. While yet a boy, he was assigned to duty in the office of the General Superintendent at Altoona. At the age of eighteen he was ordered to Washington—in 1861—and there, in company with Richard O'Brien and a few others, he formed, under the supervision of the late Thomas A. Scott, the nucleus which finally developed into that most important adjunct of carrying on the great civil war—the United States Military Telegraph. Mr. Bates distinguished himself in the matter of translating cipher despatches captured from the enemy, and in various other ways in the war department, and under the wise direction of General Eckert he developed so rapidly that in 1865, when he had barely become of age, he was appointed assistant manager of the United States Military Telegraph, Department of the Potomac. Here he showed that he had arrived at years of discretion in more senses than one. Upon the surrender of Lee, Mr. Bates was made manager of the Western Union at Washington, and the next year General Eckert advanced him to the position of superintendent of the Sixth Eastern District of the Western Union, with headquarters at Philadelphia.

In 1875, in company with Albert B. Chandler and several other bright men, Mr. Bates followed General Eckert to the Atlantic and Pacific Company, where he remained until 1879. In that year the power, skill and persistency of Jay Gould was shown in a manner that demonstrated that he was to be at the head of the telegraph business in this country as long as he chose to be. He formed the American Union Telegraph Company, and Mr. Bates was made president of it. Later Mr. Bates stepped aside to make room for his dashing chief of the war period, of the Western Union and afterwards of the Atlantic and Pacific, and General Eckert took the reins, Mr. Bates taking second place. Then the ball opened and those who had come into the Western Union, after General Eckert and his aids left it, found the task of keeping their end up too arduous an undertaking to be pleasant. Van Horne, Merrihew, Stager, Clowry and others of the old guard stood their ground, but those representing the Vanderbilt interest flopped about in a most amusing way, and one fine morning it came out that there was only one telegraph company where three had existed the day before, and that Gould had at last triumphed over Vanderbilt as a telegraph magnate. The name of the Western Union was retained, but the circumstances surroundiug this amalgamation of the American Union, the Atlantic and Pacific and the Western Union Companies would have justified naming the great telegraphic aggregation the American Union.

The greatest and most brilliant of all the leaders of opposition forces came back to the Western Union, and he brought with him, among the colonels, captains and other officers of the American Union army, his loyal assistant, D. H. Bates. This gentleman had gone into the American Union believing it was to be the telegraphic organization of the future—a strong, lasting and successful competitor of the Western Union. General Eckert accepted the new order of things with becoming grace, and if he were disappointed at the turn things had taken he concealed it. He had fought many battles, and perhaps he felt that, after all, it were just as well that he should settle down in peace and comfort in the old camp which he had left a few years before. Certainly he had won his crown of laurels. But the old harness which he had worn in the Western Union did not set easily upon Mr. Bates, and it naturally came to pass that when overtures were made to him by Robert Garrett to accept the presidency of the Baltimore & Ohio Telegraph Company that he should listen to them just as General Eckert, when he had outgrown the limitations prescribed for him by President Orton, listened to the overtures of Mr. Gould and became president, successively, of the Atlantic and Pacific and of the American Union Companies.

Mr. Bates entered the employ of Mr. Garrett in January, 1884, and he continued in active service until October 15th, 1887. In a little more than three-and-a-half years he built up the most powerful opposition to the Western Union that it had ever had or is likely to have, unless the Bell Telephone Company should some day go into the telegraph business. In creating this great telegraphic organization, Mr. Bates disproved the accuracy of a statement made by Mr. Gould, which would have made most men hesitate, and which Mr. Gould, no doubt, believed was absolutely true. The last named gentleman, in the course of an examination before Judges Sedgwick and Speir, March 5th, 1881, in connection with litigation to set aside the famous consolidation, was asked the price at which the American Union Company's system could be reproduced, and he instantly replied, "I don't believe it could be reproduced." He told the judges it could not be reproduced at any price "because you could not get control of the railroads. It is the railroads that furnish the foundation of the plant."

Six years later Mr. Gould purchased the Baltimore and Ohio Telegraph property, and it was so much larger than the American Union was that comparisons between them are not to be thought of. This magnificent plant had grown up under the fostering care of Mr. Bates, and it was by no fault of his that the Baltimore and Ohio Company had to sell it. Since there is much misapprehension on this point, we improve this opportunity to say that the railroad company, by its unwise extension to Philadelphia, created a floating debt that had to be cleared off to save the property from bankruptcy. The question arose: "What can we sell?" and it being found that the express business and the tel-

egraph system could be dispensed with, they were quickly sacrificed. There was a crying demand for ready money, and just as a merchant who is trembling on the brink of insolvency parts with his horses, his plate, his government bonds, or any other portable property upon which he can raise money, so these express and telegraph properties pas into the possession of the highest bidders. The merchant's horses may have been good ones ; the plate may have been admirable, and the government bonds were no doubt th safest of all securities ; but none of them was bank notes and they had to go. The Baltimore and Ohio Telegraph Company was well worth keeping, for though doing business at the ruinous rates insisted upon by Mr. Garrett, the property was taking care of itself. If Mr. Garrett had possessed the bottomless pocket of Mr. Gould, and had the latter been as reluctant to fight as Mr. Vanderbilt was, the American Union episode would probably have been repeated on a much grander scale. But Mr. Gould never runs out of money and he never surrenders his affairs into the hands of such men as the napoleonic Ives. Mr. Garrett was weak in many important respects. In fact he was not big enough for the emergency, and all the grand work of Mr. Bates and his brilliant corps of lieutenants came to naught, save in so far as it demonstrated their fitness to rank with those who control the commercial destinies of the world.

One of the most novel uses to which the electric light has been put is that of illuminating the Caverns of Luray. These are the only caves in the world lighted by electricity, and the circuit is over seven miles long. Photographs of the interior of the caverns are taken by the aid of four electric lamps, the necessary time for the exposure of the sensitve plates being from six to ten hours. Some very fine pictures can be taken by this means as the steady, evenly-diffused light of the electric lamps is the only light in the cave.

THE CABLE WAR.—A special dispatch from London, of May 7, says : "The cable war shows no sign of coming to an end. The Mackay and Bennett cable, otherwise known as the Commercial Cable Company, continues to stand out upon an independent footing, and is now preparing for a fresh attack upon the pool companies. The merchants of Mincing Lane and Mark Lane have contributed for years many thousands of cablegrams to the pool companies, and it is the intention of the new company to break up the monopoly and detach a large slice of this golden business. With a view to assist the attack, the directors have just opened an office in Mark Lane. The Mackay-Bennett Company has made many friends, especially among journalists, for this company brought down the almost prohibitive tariff for press messages between the New World and the Old."

A UNIQUE TELEGRAPH SYSTEM.—There has grown up among the farmers of a county in Michigan a telegraph system which might be generally extended throughout the rural districts everywhere. The system began by two farmers connecting their houses with a wire for their own convenience and operating their line with the ordinary Morse instruments. Gradually other farmers extended the line to their houses, and after a time the wire was run into the neighboring village. Seven years ago the combined farmers and a few village merchants organized themselves into a company and it has since been extended until now it has sixty-five miles of wire and ninety offices, two-thirds of the latter being in farm-houses, and nearly all the rest in stores where these farmers do their trading.

The supreme court on May 14 denied the application for a rehearing of the telephone case. This application was made by the People's and Overland telephone companies, who claim that Drawbaugh and not Bell, was the first inventor of the telephone.

POSTAL TELEGRAPHY.—General Master Workman Powderly has addressed a letter to Representative Rayner, chairman of the House Sub-Committee on Telegraphs, on the subject of the Postal Telegraph bills now before the House. Mr. Powderly informs Mr. Rayner that about a million Knights of Labor inside of four weeks last winter, signed a petition to Congress in favor of a Postal Telegraph system, and had he known that the subject would not have been acted upon earlier, he couid have procured 5,000,000 signatures of Knights and citizens.

Mr. Powderly then goes on to say that "he holds from leading members of both parties throughout the country affirming their belief in the necessity for the establishment of a Government telegraph. I can procure for you the written pledges of the officers of Congressional committees of both parties throughout the United States to act with their congressmen in support of this measure. Our members have secured the written pledges of over a majority of the House of Representatives to vote for the measure when it comes before the House ; therefore, there can be no good reason why this bill should not receive just consideration at the hands of Congress this session.

THE TELEGRAPH BILL.—Dr. Norvin Green appeared before the House Committee on Post Offices and Post Roads, at Washington, a few days since, to present some facts upon the subject of the telegraphic system of the country. He first addressed himself to the Hopkins bill to establish a postal telegraph. Such an enactment would be, he said, a monstrous wrong. The rights of property were entirely ignored. The average monthly salary of operators—male and female—in England was $26, as against $61.45 in New York. The 615 operators in the New York offices did about 15 per cent. less work than the 1,943 English operators. This was not because the English operators were not able to do as much work as the Americans, but solely because of the general loose methods of government employees.

Mr. M. F. Leech, the operator on the Union Pacific Railroad, who tracked the famous Big Springs train robbers, and was handsomely rewarded, has secured a big ranch near Boise City, Idaho.

The *Telegraphist*, the jounal of the telegraphers of Great Britain, has suspended for want of support. The paper was an excellent one, but as in America, few paid for the paper while all read it.

The Auto-Typewriter Company are now preparing for business in the old telephone building at the corner of Greenwich and Liberty streets.

The American Bell Telephone Company issued a circular last week offering stockholders the right to subscribe at par for 2,000,000 seven per cent. ten-year bonds, issued for the construction of the long-distance telephone system. The company will have the right to redeem the loan August 1, 1890, or any interest day thereafter, at 1.10 and interest. The transfer books close from June 1 to June 10 inclusive. Each holder of fifty shares is entitled to subscribe to one $1,000 bond.

The Board of Aldermen, May 22, by a vote of 14 to 10, refused to allow the New York and Harlem Railroad Company to use electric motive power on its Fourth avenue line. The railroad company claims the right under its charter to run electric motors as far south as Fourteenth street without the consent of the Aldermen, and will do so without further delay, relying upon public sentiment to force the Aldermen to grant the necessary permission below that point.

The Brooklyn City Railroad Company has made application to the civil authorities for permission to run the cars on the electric motor principle, as an experiment, between Fort Hamilton and Thirty-ninth street ferry.

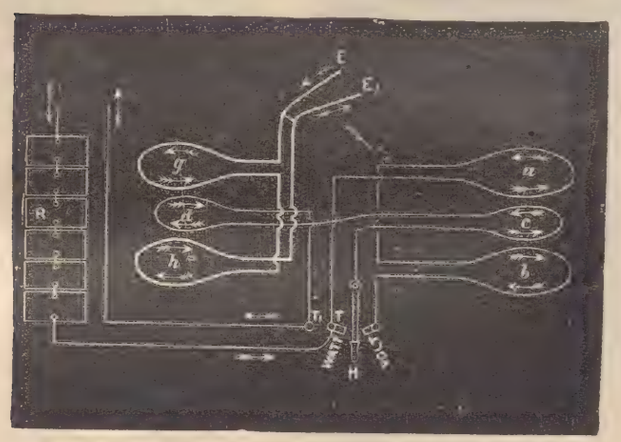
The long-distance telephone line from New York to Buffalo which is in course of construction will pass five miles south of Rochester but will loop into that city.

The Gamewell fire and police alarm system is to be installed at Charleston, S. C., and Mobile, Ala.

ON A NEW COMPOSITE ELECTRIC BALANCE.*

BY SIR WILLIAM THOMSON, F. R. S.

This instrument has been designed for the purpose of providing, in one instrument, the means of measuring (*a*) the difference of potential between two points of an electric circuit, as, for instance, the difference of potential between the supply conductors of an electric light installation, (*b*) the current flowing in such a circuit, and (*c*) the rate of working in the circuit. The instrument thus forms a combined voltmeter, amperemeter, and wattmeter. The general form of the instrument is similar to that of the standard centi-ampere or deci-ampere current balances, and it consists of (1) two coils of silk-covered copper wire fixed one above the other with their planes horizontal on a slab of slate, (2) two coils of similar wire made up in the form of anchor rings and fixed to the ends of a balance beam, (3) two coils fixed similarly to (1), but capable of carrying currents up to 500 amperes. The beam of the balance is suspended by two flat ligaments of fine copper wire in such a position that one of the coils fixed to the end of the beam is suspended midway between the fixed pair of fine wire coils (1) while the other suspended coil is similarly placed relatively to the thick wire, or current, coils. When the instrument is used for the measurement of alternating currents the current coils are made by two or three turns of a stranded conductor. Each wire of the stranded conductor is covered with silk so as to insulate it from the others, and, in order as far as possible to



annul the effect of induction in causing the current to be different at different distances from the axis of the conductor, the strand is given one turn of twist for each turn round the coil.

The arrangement of the connections in the instrument will be readily understood from the figure, which shows diagrammatically the arrangement of the coils. In this figure *a* and *b* represent the fixed fine wire coils, *c* and *d* the suspended coils, and *g* and *h* the current coils. The instrument is joined in the circuit through a suitable anti-inductive resistance, R, through which the current passes to the terminal, T, from which the course of the current through the coils to T1 is indicated by the arrows in the diagram, the switch handle, H, being in this case turned to "volt." For the measurement of amperes the switch is turned to "watt," a measured current passed through the suspended coils of the balance, and the currents to be measured passed through the coils, *g*, *h*, by introducing the electrodes, E, E1, into the circuit. The current through the suspended coils may sometimes be measured by means of the instrument itself arranged for the measurement of volts. This may be done by first measuring the current which the difference of potential between the supply conductors of an electrical installation, or between the poles of a battery, causes to flow through the fine coils of the instrument and its external resistance, and then turning the switch to "watt," and, at the same time, introducing a resistance into the circuit equal to the resistance of the fixed coils. When the balance is used as a watt-meter the switch is turned to "watt," and the terminals, T, T1, joined to the supply conductors, while the current through the circuit is passed through the coils, *g*, *h*. When the rate of working in an alternate current circuit is measured by such a balance, the anti-inductive resistance, R, must be so great that there is no sensible difference of phase between the currents flowing through the fine wire coils of the instrument and the electromotive force on the supply conductors to which they are connected.

*Abstract of a paper read before the Philosophical Society of Glasgow, and copied from the Electrical Review of London.

ANNUAL MEETING OF THE ELECTRICAL ENGINEERS.

The annual meeting of the American Institute of Electrical Engineers was held at the Civil Engineer's Home on 23d street last week. Besides the officers holding over the following gentlemen were elected: President, Edward Weston; vice-presidents, Elihu Thompson, Francis R. Upton, T. C. Martin; secretary, Ralph W. Pope; treasurer, Geo. M. Phelps, Jr.; managers, Charles Cuttriss, Geo. B. Prescott, Jr., Wm. Maver, Jr., T. D. Lockwood.

The following papers were read. "On a new system of Alternate Current Motors and Transformers," by Mr. Nikola Tesla; "Underground Electrical Systems in Europe and America," by Prof. G. W. Plympton of the Brooklyn Subway Board; "On Compensated Resistance Standards," and "On Prof. Molar's 'Swinging Arm' Galvanometer," by Prof. Edward L. Nichols of Cornell University; "The Patent Court and Uniformity in Patent Practice," by Mr. Geo. H. Stockbridge; "Protection of the Human Body from Dangerous Currents," by Mr. P. B. Delany.

A modified form of the phonograph, invented by Prof. Alexander Graham Bell and associates, is said to give excellent results.

Still another form has been perfected by Mr. Emile Berliner, of Washington, D. C., who recently read a paper on the subject before the Franklin Institute, Philadelphia, and also exhibited his new instrument, which he styles the "gramophone."

A defective wire started a conflagration in the Metropolitan Telephone Exchange, at the southeast corner of Sixth avenue and Thirty-ninth street, May 23d, and both of the immense switchboards were destroyed and considerable additional damage done. General Manager Eckert says the two switchboards cost $75,000, and that the 1,135 subscribers between Twenty-third and One Hundred and Tenth streets will be cut off for some time, as it will take three weeks to repair the damages.

Mr. H. C. Adams, who has for some time been the treasurer and factory manager of the American Electric Manufacturing Company, was elected president and general manager of the company, in place of Edwards H. Goff, resigned.

WESTERN UNION ANNEXATION.—Chicago advices say that the Western Union Company has made a contract with the St. Paul road whereby it secures control of 1,900 miles of wires, including over 200 offices in Iowa, Nebraska, Minnesota and Dakota.

The Southern District Telegraph and Electric Company, at Birmingham, Ala., has been organized by E. W. Linn and others, with a capital stock of $40,000, and the American District Messenger and Electrical Supply Company has been formed by J. M. Stephens and others, with a capital stock of $10,000, at Atlanta, Ga.

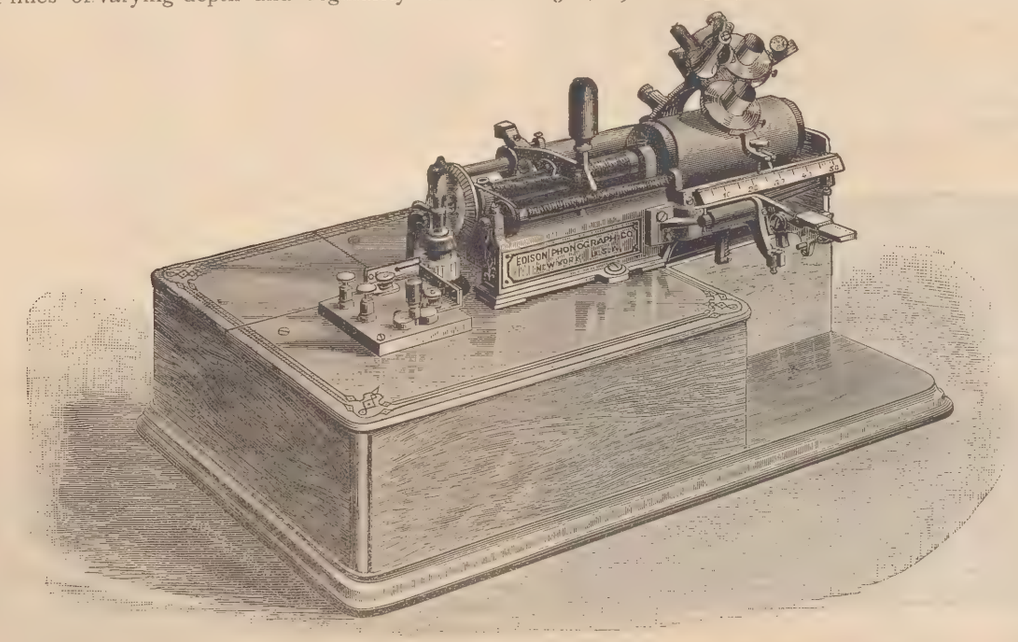
The Kansas City Electrical Works have just reorganized under the laws of the State of Missouri with a capital stock of $10,000. The stockholders are E. L. Martin, G. M. Myers, W. H. Woodring, C. E. Kearney, W. J. Terry and C. G. Perrin.

EDISON'S PERFECTED PHONOGRAPH.

The Edison phonograph, which this cut illustrates, consists of a box about eleven inches square, which contains the motor. The armature is simply a ring of metal placed horizontally, with ten pole pieces or bars around the rim. The box also contains the eccentric governor. The shaft on which the hollow receiving cylinder is placed is four inches long, and has 100 threads to the inch. The shaft feeds the spectacle, containing in one ring the transmitter and receiver. The recorder is a steel knife fastened to the diaphragm, and the receiver is a delicate metal needle, operating on what are called phonograph blanks, which are cylinders of wax or composition metal. These are what the impressions are made on, and they taper inside so as to bind on the shaft.

In the operation of the phonograph a little key is shifted on top of the box containing the motor, and with a perfectly steady motion the cylinder begins to revolve. The operator then, in an ordinary tone of voice, speaks into the "recorder" eye of brass spectacle. As he talks the diaphragm vibrates and a tiny metal point affixed to its under side begins to mark lines of varying depth and regularity on the wax cylinder. When his remarks are finished the operator turns a key which lifts the recorder out of the way and brings the reproducer into its place, the cylinder is shifted back to its starting point, the motor set running again, and the delicate little membrane, which has like the recorder a tiny point affixed to it, begins to give back in low, but clean and distinct tones the words which have been spoken.

In principle the phonograph is the same as that which was exhibited ten years ago.



EDISON'S PERFECTED PHONOGRAPH.

AN IMPORTANT DECISION.—Some time ago we announced that the Edison Company had brought a large number of suits in defence of its patents in the United States Circuit Court. About thirty of these suits were against the United States Electric Lighting Company for infringement of patents. Judge Wallace has just decided that the Edison patents expire with the foreign patents. Under section 4887 of the United States Revised Statutes there is a provision which was the basis of the defence. In substance it reads that when foreign patents for short terms have expired before the same invention has been patented in the United States, the American patents expire with the foreign patents. The suit will prove the necessity to inventors of not filing applications in foreign countries before the patent is granted in the United States.

ELECTRICAL PATENTS GRANTED MAY 8, 1888.

381,461 Telephone system; Richard N. Dyer, New York, N. Y.

382,417 Process of making phonogram blanks. 382,418 Phonogram blank. 382,419 Process of duplicating phonograms; Thomas A. Edison, Llewellyn Park, N. J.

382,444 Electric burglar alarm; George F. Daft, Boston, Mass.

382,483 Electric motor for railway cars; William M. McDougall, East Orange, N. J.

382,599 Automatic switch for secondary batteries; Camille A. Faure, New York, N. Y., assignor to the Electrical Accumulator Company of New York.

Granted May 15, 1888.

382,738 Galvanic battery; George H. Sloane, Boston, Mass.

382,778 Underground conduit for electric wires; Walter F. Smith, Philadelphia, Pa.

382,829 Telegraph cable; William R. Patterson, Chicago, Ill., assignor to the Western Electric Company, same place.

382,846 Manufacture of incandescent electric lamps; Edward P. Thompson, Elizabeth, N. J.

382,856 Repeating induction coil; John A. Barrett, Brooklyn, N. Y.

382,968 Storage battery; Chas. D. P. Gibson, New York, N. Y.

A CABLE TO HAYTI.—A special dispatch from Port au Prince, Hayti, says: Cable connection with the outside world is now *un fait accompli*. The first message sent over the new cable came from the company's engineer, Mr. Seaton, dated Agnadores, Cuba, on the 15th of April last, and addressed to the Government's Engineer-in-Chief, Mr. Leon Laforestrie, at Mole Saint Nicolas, Hayti. The latter place is the landing-point of the cable, with which all the towns of the Republic will be connected by land wires, arrangements having been completed to lay the same at the earliest possible moment.

Mr. T. A. Edison is to erect works at West Orange for the manufacture of phonographs. It is also reported that he will erect a large chemical works in Orange or Montclair.

EXPERIMENTS IN STATIC ELECTRICITY WITH THE INCANDESCENT LAMP.*

BY ELMER E. E. EMMONS.

The incandescent lamp is generally classed among the applications of dynamic electricity, and, practically speaking, it properly belongs there, but many who are interested in science may be interested to know that the incandescent lamp may also be classed with the apparatus for studying the phenomena connected with static electricity.

With an Edison lamp, two or three suspended pith balls, some fragments of light material, and a silk handkerchief, the two fundamental laws of static electricity may be demonstrated.

The lamp should be held by the small end and the glass bulb rubbed with the handkerchief and then presented to the substance experimented upon. The bulb should be heated slightly to dry it.

Now, if a lath is balanced on a point on the bottom of a round-bottomed bottle, it can be made to revolve by holding the rubbed bulb near one end. (Fig. 1.)

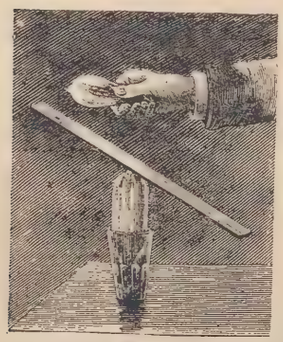


Fig. 1

In fact, any experiment that can be made with a glass rod or stick of sealing wax can be made with the lamp.

If, in the dark, the lamp is held by one hand and the bulb rubbed with a piece of cloth, the interior becomes filled with a bluish white light. (Fig. 2.)

I find that the hand is as good as anything for the above experiment, for if the hand be moved rapidly up and down, striking the bulb a glancing blow as it passes, the glow may be made to fill the entire globe, and, after stopping, if the hand is placed against the glass, the interior will be immediately lighted up, and it may be repeated several times without more rubbing.

When a barrel of lamps is opened and the lamps gently stirred, the same glow spreads through the whole mass of lamps disturbed.

In the above experiments the carbon filament may be entirely destroyed, and for the experiments in attraction and repulsion the lamp would be somewhat improved thereby.

It is, however, as a condenser that the lamp excels.

If the lamp is held by the bulb, and the metal piece connecting with the carbon presented to the prime conductor of an electrical machine, it will become charged, that is, if the person holding it is standing so as to be "grounded."

Fig. 2

The lamp can also be charged by an electrophorus, or from a running belt if the latter is charged.

If, when the lamp is charged, the holder touches the metal with his free hand, he will receive a smart shock. If another person touches the metal on the lamp, they both will receive a shock, the circuit being completed through the ground.

If the lamp is held long enough, the time depending on the quantity of electricity to be derived from the charging device, the lamp will finally discharge itself, the spark jumping from the metallic portion of the lamp to the hand of the holder, and the holder is made aware of the fact by the loud snapping sound and a pretty heavy shock. (Fig. 3.)

Fig. 3.

By watching, the spark may be seen as it jumps the interval.

By taking hold of the lamp well down toward the end of the bulb, the spark can be made to jump the whole distance between the ferrule and the hand, a distance of three inches or more.

It is really astonishing what a heavy shock one can get from a sixteen candle lamp; and if the original inventors of the Leyden jar had been holding a healthy incandescent lamp in their hands instead of the historic phial of water at the time they received their first shock, it is probable that they would never have ventured near enough to have taken another, judging from the fright the phial caused.

To make a first-rate Leyden jar the lamp should have tin foil pasted over it to within 1½ inches or 1¾ inches of the ferrule. It may then be held in any convenient way suitable for experiment.

With a lamp so arranged, all the experiments usually made with Leydan jars can be performed.

The foil is, of course, to be connected with the earth.

Running a wire to the floor is usually sufficient.

I have taken with the foil on it, suspended it near a running belt, connected the foil to "ground" by running a wire from it to the floor and then run a wire from the metal connection to within a few inches of the belt. So arranged, the lamp will become charged very rapidly and discharge the spark leaping through the air between the ferrule and tin foil and close to the glass. (Fig 4.)

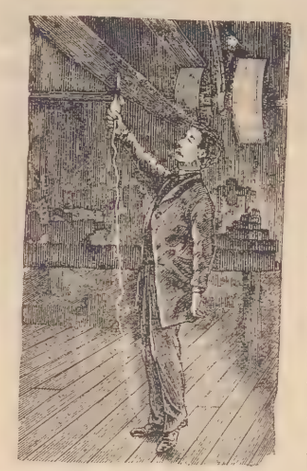


Fig. 5.

During the time of charging, the space inclosed by the carbon filament is filled with a pale blue light, and at discharge the whole globe is illuminated, the light being due to discharge in vacua, and not to the carbon being heated.

If the carbon is broken in two, it works just as well, so that burned-out lamps may be obtained and used. Any one who has ever tried to make a Leyden jar knows the difficulty in getting good glass, but the lamp is perfect in that respect.—*Scientific American.*

The East Cleveland Railroad Company has applied to the Council for permission to operate cars on the East Cleveland line and on Cedar avenue with electricity.

Mr. David Brooks of Philadelphia has laid a cable for the Pennsylvania Railroad between the Broad street station and that at Thirty-second and Market streets, in that city. The cable, which was manufactured by Mr. Alfred F. Moore, was laid in a pipe surrounded by Mr. Brooks' new insulating compound, consisting of rosin and rosin oil.

The New York Legislature has passed an act which provides for the execution of criminals by causing to pass through the body of the convict a current of electricity of sufficient intensity to cause death, and the application of such current must be continued until such convict is dead.

PROTECTION OF THE HUMAN BODY FROM DANGEROUS CURRENTS.*

BY PATRICK B. DELANY.

Since the object of reading a paper befo e this society should be the enlightenment of members on the subject under consideration by the presentation of facts developed by experimentation or of theories supported by a reasonable amount of investigation, I must apologize for my delinquency in both respects, and trust to the kind indulgence of the society in making a few suggestions with a view of eliciting information and opinions from those whose experience and familiarity with the subject enables them to speak with authority.

I allude to what are considered dangerous currents and their effect on the human body. That there is danger in handling conductors conveying high tension currents must be generally admitted. The question, therefore, is, can fatal results from such currents be wholly or partially averted? All will agree that with proper care on the part of the companies and intelligent co-operation on the part of employees, but little would be heard of the danger of electric currents. But companies are economical and employees are careless. Familiarity with danger breeds contempt for it. This is exemplified almost daily in every department of industry. A new man in a powder mill will exercise the greatest care and observe all the rules of the establishment faithfully. In a few months the same man will smoke a pipe over an open powder keg.

Protection is necessary principally for those who through carelessness or ignorance fail to protect themselves. It has been claimed that there can be no such thing as an accident —that nature has none, and that all so-called accidents are simply the results of miscalculation, bad judgment or carelessness. But it must be remembered that the vigilance of the most alert will sometimes relax, and this to them is the moment of danger.

Realizing that something should be done to protect dynamo men and wire handlers from injury from powerful currents, I, a few years since, invented a device for shunting the vital parts of the body. Partly on account of a pressure of business in other branches of electricity, but principally owing to a hesitancy in bringing out a device about the efficacy of which there seemed to be some doubt, its introduction to scientific criticism was delayed until a few weeks ago. As the references made to the question in the electrical papers have failed to elicit an expression of opinion satisfactory to any degree, it has been deemed advisable to bring the subject before this meeting.

The question to be determined is, to what extent a wire of practically no resistance, extending from one wrist to the other and bound around the wrists in numerous convolutions, so as to make good, but not uncomfortable, contact, will protect the vital parts of the body from fatal injury when it is placed in the path of a dangerous current through contact at the hands. It is claimed by some that the current having once entered the muscles, veins and tissue at the hands, will not leave the arms at the wrists and follow the shorter path of the wire, but will confine its course to the arms and body alone. The other opinion is that the greater portion of the current received at the hands will leave the arms at the wrists and follow the wire. The problem seems a difficult one to solve. So much depends on the condition of the person at the time of receiving a shock, a large number of tests would be necessary to arrive at results which would afford a safe basis for calculation. A few years ago Dr. Stone, connected with one of the London hospitals, made a series of interesting experiments upon patients afflicted with various ailments, with a view of determining whether or not fluctuation in their physical condition affected the electrical conductivity or resistance of their bodies. The results proved, according to my recollection, that great changes took place in the electrical resistance of the patients experimented upon from day to day, and that there was a direct influence manifested by the rise and fall of different diseases upon the electrical conductivity of the body as a whole or in part. An account of Dr. Stone's experiments was published in *Nature* at the time. But while the experiments are most valuable for the purpose for which they were intended, they throw but little light on the subject of dangerous currents and protection from fatal injury.

Last September there was published in the *Electrical Review* of London, a paper on "Shocks from Alternating Currents," by Mr. G. L. Addenbrooke, who for some time previous had charge of the Grosvenor Gallery installation, where a primary current of 2,500 volts was constantly employed. While no one had ever come in contact with both mains at once, the writer stated that even if such an accident had happened he was "by no means prepared to assert that the result would undoubtedly be fatal." "Indeed," says he, "I rather incline to the opinion that if the subject of the shock were healthy, and the circumstances under which he received it were favorable, the chances are he would survive."

I cannot make out what Mr. Addenbrooke means by receiving 2,500 volts under favorable circumstances. It seems to me, if they are received at all, the circumstance could not be other than unfavorable. Mr. Addenbrooke, himself, received a severe shock, and as he speaks from experience, I quote his account of how it affected him: "The primary effect of the passage of the current through the body is, of course, to contract the muscles. The amount and persistence of this contraction depend on the quantity of the current flowing, or, as it is usually designated, *the intensity* of the shock, and varies from a simple twitching of the limbs to complete an intense contraction or rigor of apparently every muscle in the body. In this latter case, the current completely supersedes the action of the mind over everything capable of contraction or movement. Consciousness, however, is apparently rarely, if ever, lost, though the subject may be entirely unable to make any motion, cry out, or do anything to help himself. If aid is not near, such a state may be maintained for some time. On release from such a position by extraneous or natural causes, the subject is usually dazed, but if at all unconscious, soon recovers completely and experiences no further functional disturbance than the debility and nervousness naturally following such a severe strain on the system." While admitting that fatal shocks are possible, this gentleman gives it as his opinion that "if the shock is not sufficient to cause instantaneous collapse apparently the body can bear the strain of the continued passage of the current for some time," and that death is caused by paralysis of the involuntary muscles controlling the heart and lungs, and that the preliminary stages of total collapse are analagous to what occurs when drowning." Referring to the local action of the current on the body where it enters and leaves, this writer also says: "If the contact is good, that is, if it consists of a good area, say of over a couple of square inches of a fairly moist skin, pressed with moderate firmness against a metallic body or other good conductor, no visible injury may result. For instance, a man will often get burnt about the hands, but his feet, by which the current leaves, will be unaffected, or only slightly reddened or inflamed. Burning of the hands or other parts of the body will occur when there is imperfect contact of the body with the conductor, coming in contact with a bad or semi-conductor, such as a dirty or carbonized surface. The burning is caused by the absolute setting up of an arc."

It seems to me this gentleman's views, based, as we are led to believe, on actual experience, are somewhat paradoxcial. And surely numerous cases of deaths from currents recently disprove many of Mr. Addenbrooke's deductions. True, nothing short of death is made public, so that there is but little information to go upon relating to the in-

* Read before the American Institute of Electrical Engineers, May 16, 1888.

stances which must be of frequent occcurrence where men are *almost* killed by electric shocks. In all cases that have come to light, whether simply injuries or cases of death, the parts of the body coming in contact with the current have been badly burned. The unfortunate "Trouble Hunter," who lost his life a few days since, was not only burned at the hands but at the knees. In cases where the shock is not instantly fatal, may it not be that the burning of the flesh at the points of contact is so great as to destroy to a considerable extent the conducting substance in contact with the wire, and thereby cause a fall in the current passing through the body? It is certainly owing to the fact that the body being a very poor conductor that harm is done. If it offered no resistance there would be no realization that a current was passing through it. An arc would be created at the point of contact, provided the contact was imperfect, but the body itself would be uninjured. It seems to me that the human body must be viewed as any other semi-conductor, with the exception perhaps of susceptibility to greater change under the continued action of a current owing to the fluids which it contains. It is owing to its resistance that a carbon filament becomes incandescent.

The carbon rod of an electric lamp is not consumed except at the point where the arc is formed by the resistance of attenuated particles under combustion. Any conducting substance placed in the path of more current than it is capable of conveying must be heated, consumed or decomposed, according to its nature and in proportion to the discrepancy between the conducting capacity of the conductor and the sum of the current.

Now if we liken the human body from hand to hand to a canvas hose or tube filled with water and which allows a certain quantity of moisture to ooze through the surface, corresponding to the moisture of the skin, and if this be inserted in a circuit, connection being made at the extreme ends, corresponding to the hands, and a shunt wire of minimum resistance be wound around the tube two or three inches from the ends, corresponding say to the wrists, we can, perhaps, more understandingly speculate on the action of a dangerous current on the human body, contact being made at the hands and the shunt wire encircling the wrists. It should be borne in mind that the contact between the shunt wire and wrists is much better than the contact at the hands, since the wrists are more tender than the hands. Now referring to the tube and assuming that the contacts at the ends have improved by reason of the currents eating its way into the water, does it not follow that the current instead of following the entire length of the tube of water, offering, say thirty times the resistance of the two or three inches of water from the end of the tube to the shunt wire, and several thousand times the resistance of the shunt wire itself, will, to a great extent, pass from the tube to the shunt wire and in its passage *improve* the contact at that point as it did at the ends in entering the tube? I have often noticed that upon receiving a shock of 150 to 250 volts profuse perspiration instantly followed. This would greatly improve the contact at the wrists above the normal, so that it would seem impossible that the current should confine itself to the fluids and muscles of the body in preference to the wire when separated from the wire only by thin, tender skin filled with moisture.

In considering the danger point of currents it seems reasonable to recognize the same law, or rather recognize the absence of any law, governing other destructive agencies. Let it be concussion, strain, asphyxia, poison, or other enemy of endurance, there are hardly two cases alike. One man may emerge with but slight injury from a cause which to another man would be death. Why should it not be so in the matter of electric shock? Death, of course, must be the consequence of a certain degree of cause. If 2,000 volts are necessary to kill in any instance, one volt less would avert death, while shunting 100 or 500 volts would leave a proportionate margin of safety. Fatal results through the medium of electricity do not come by jumps any more than by any other force or element of destruction. There is in this subtle agency, as in all others, a last straw which breaks the camel's back—a last volt which does the final harm. Hence the importance of protecting, as far as possible, those exposed to this danger.

Regarding the immediate cause of death or the effect of currents on the substances of the body, we must look to the medical men for light. Probably all subjected to shock might not be similarly affected. In one case it might be the heart, in another the brain, and in others the lungs that might be injured. Why not have a thorough investigation of this subject, and then perhaps wire handlers may be subjected to an examination before they are allowed to engage in such work, just as men are examined for various other duties.

There seems to be so little known about these matters, I shall feel gratified if this paper serves as even a feeble incitement to discussion and investigation, as I can conceive of no subject offering a more humane incentive.

OBITUARY.

George M. Phelps, one of the foremost of American electrical mechanicians and inventors, died of paralysis at his home in Brooklyn, on the evening of Friday, May 18. Mr. Phelps was born in the town of Watervliet, Albany County, N. Y., March 19, 1820, and very early in life became associated with his uncle in the manufacture of mathematical instruments. At the age of 22 he became interested in electrical machinery and continued in its development and manufacture for nearly forty years. Although Mr. Phelps' remarkable inventive genius was applied chiefly to the perfection of electrical printing and recording apparatus, the Morse instruments constructed under his supervision have, in the judgment of hundreds of operators of the old school, never been surpassed in beauty of design, excellence of workmanship, or qualities of effectiveness. It was his complete knowledge of his profession that enabled the Hughes Printing Telegraph to find a place in the list of telegraphic successes, and to his invention of the Phelps' combination printer—a combination of the House, Hughes and Morse systems—followed some years later by the still more successful Phelps' electro-magnetic motor, the fact that the printing telegraph system still survives is undoubtedly due. Mr. Phelps assumed control of the mechanical department of the American Telegraph Company in 1856, survived that company's absorption by the Western Union, and retained his position with credit to himself and to the eminent satisfaction of the corporations employing him until the Western Union shops were turned over to the Western Electric Company a few years ago, when he retired from active pursuits. His funeral took place at Watervliet.

Stephen B. Morse died at Brown's Valley, Minn., April 20th, 1888, of phthisis pulmonalis.

Many things of general interest can be learned in a telegraph office: for instance, an observant operator in the cable service has noticed that orders for goods of continental manufacture have increased amazingly during the past few years, while orders for British articles have correspondingly decreased.

The record of 276 cablegrams sent to Europe in one hour over the Anglo-American lines, was raised to 300 cablegrams in one hour last week by both James B. Gaynor and W. L. Brown. This is an extraordinary record.

Dr. Otto A. Moses, the eminent electrician, on May 25, lectured on "Some Phenomena of Alternating Currents," before the New York Electrical Society.

Prof. A. Graham Bell sails for England June 2, to attend before the Royal Commission in the instruction of deaf mutes.

Permits have been granted to open the streets of New York for the extension of the underground system.

THE MAGNETIC CLUB.—At a recent meeting of the Governing Committee of the Magnetic Club, 31 new members were admitted. July 11 has been decided upon as the date for the next meeting of the club.

Mr. E. W. Buckley, a well-known telegrapher, for many years in St. Paul, graduated a few days ago in New York as a doctor of medicine. Dr. Buckley stood highest in his class.

THE TELEGRAPH BEATS THE PHONE.

A TEN MINUTE COMPETITIVE DASH FROM NEW YORK TO BOSTON.

A unique race took place May 24, between two famed competitors in annihilating time and space. It was a hotly contested ten-minute dash from *The Sun* office in Printing House square, New York, to the office of the *Boston Herald*. The competitors were the fleet long distance Telephone and that dandy speeder *The Sun's* Special Wire. The race was designed to decide the respective merits of the two lightning rivals on the swift transmission of news.

The start was made from *The Sun* office as the City Hall clock marked 5:07 o'clock. The telephone toed the mark on a corner of the fire-proof file room on the third floor of *The Sun's* new building, and the Special Wire came to the scratch on the second floor. Both were started at precisely the same moment by a signal given by a reporter, and simultaneously tackled the task of delivering in Boston, in the best possible shape with the least possible delay, a section of *The Sun's* dispatch from California, about the attack of Chinese pirates upon the steamship San Pablo, wrecked on a reef off Turnabout Island in the Formosa Straits off the China coast. Anybody who reads the dispatch can see for himself that it is a narrative in which dipthongs and unfamiliar names have the call on the vowels and simpler words that both the telephone and telegraph can most readily transmit.

George W. Irwin, an accomplished telegraph transmitter, fingered the Morse key in the office of the News Bureau on the second floor, while R. L. Holden, a bright young expert from the central office of the Long Distance Telephone Company, sat down at the telephone table in the file-room and began to talk into the nickel-plated receiver. He fitted around his head a nickel-plated frame that held a little receiver disk snugly pressed to his left ear, and carefully read off the dispatch word by word, with deliberate enunciation, and apparently met with much more marked success in making himself understood by the receiver than is ordinarily attained by average patrons of the telephone.

Every word he spoke was carried by a cable made of what is technically called a "hard drawn" copper wire of No. 12 guage, the largest wire manufactured for the telephonic system. Part of the wire runs underground in the suburbs of Boston, but the major part is aerial. The wire cable runs direct from the *The Sun* office to the executive offices of the telephone company at 53 Devonshire street, Boston.

The wire is uninsulated, and yesterday's test demonstrated that it is comparatively impervious to the retarding influences of rain and fog that invariably injuriously handicap the usefulness of telephones furnished with the insulated telephone wire.

The man who received the telephone message was Mr. Wood, an expert from the *Boston Herald's* own office, who was pitted against Mr. H. C. Wolever, the Boston expert at the Hub end of the special wire.

Time was called at 5:17 o'clock exactly, and each of the transmitters in *The Sun* building checked off with a pencil the number of words he had succeeded in starting in a race for Boston, and then shook hands laughingly, and awaited news by telegraph of the result of the conflict. Comparisons made in the meantime in *The Sun* office showed that the expert telephone transmitter had succeeded in sending 346 words over the long distance wire, and that the expert telegrapher had rattled off 330 words, exclusive of punctuation marks, and had spelt out each word. This is equal to an average transmission of 1,980 words an hour. The telephone operator had stopped but thrice to spell out words. One of these was "Turnabout" and the other was "Reed," the name of the captain of the wrecked steamer. The rest of the dispatch that he sent was understood without difficulty by receiver. The operator said that it wasn't necessary for him to call out the punctuation of the dispatch to the receiver. He could indicate by the inflection of his voice in sending the message what was the appropriate punctuation of the sentences he talked at the telephone.

But that the receiver at the Hub end of the competition hadn't fully comprehended the meaning of these inflections was shown by the message that came to *The Sun* over the telegraph wire thirteen minutes after the test announcing the result. It was forwarded by Mr. J. H. Holmes of the *Boston Herald*, and read :

Telegraph message delivered all right, and in shape for the printers. Telepone message delivered in abbreviations that are not comprehensible to printers.

"What does that mean?" *The Sun* reporter asked.

"It means," said the young gentlemen who had acted as an overseer of the race," that the special telegraph wire has won the race. It has beaten the telephone by turning out a message that was in perfect condition, judged by a newspaper standard."

The expert backers of the rival racers asked, after this test, that another race be arranged, with the conditions changed so that the test message could be reproduced at the finish by a type writer. The advocates of each competitor declared that this condition would enable the electric racers to attain their highest degrees of efficiency as servants of the newspapers.—*Sun*, May 25th.

T. M. B. A.—Assessment 218 has been hired to meet the claims arising from the deaths of J. F. Farrell F. G. Cadwallader and J. J. Fuller, and should be paid before July 1. Second division assessment has been levied to meet the claims arising from the death of S. B. Morse.

Mr. Frank English, a well-known operator, is secretary of the Friendship Boat Club, a prosperous Harlem institution. Several other prominent telegraph people are members of the club. The annual opening took place on May 27, when a very enjoyable time was had.

Mr. Walter Louis, formerly of the J. M. & I. R. R., Louisville Ky., but now train dispatcher on the N. Y., P. & O. R. R., at Galion, Ohio, was married May 24, at Louisville, Ky.

Mr. H. H. Allingham, a well-known Montreal operator, is sojourning at St. John, N. B., for the benefit of his health, which has been bad of late.

The wife of Mr. G. D. Butler, manager of the Western Union, Rochester, N. Y., died a short time since.

Mr. R. H. Taylor, formerly of the B. & O., is now with a broker at Nashua, N. H.

THE CARBONDALE, PA., ELECTRIC ROAD.

We present herewith an excellent view of a car on the track of the Carbondale & Jermyn Electric Street Railway Company, which went into operation recently, using the Sprague system. The road is five miles long, and is built with 25-pound T rails and 57-pound flat rails. The overhead wire is used, and the illustration shows Mr. Sprague's method of making contact from the under side of the wire. The president of the road is Mr. J. W. Aitken, who is operating it from the Westinghouse electric light station.

THE RICHMOND ELECTRIC RAILWAY.

The following complimentary letter was received last week from the syndicate which put in the Richmond Union Passenger Railway. The Sprague Company has no financial interest in this road, neither has the syndicate any interest in the Sprague Company. This road is not only an electrical

CAR ON SPRAGUE ELECTRIC RAILWAY AT CARBONDALE, PA.

but a financial success, having some days carried nearly thirteen thousand passengers :

E. H. JOHNSON, ESQ., Prest. Sprague Electric Railway and Motor Co..

Dear Sir :—We take pleasure in notifying you of our acceptance of the electrical equipment of the Richmond Union Passenger Railway.

The road which you have equipped under most trying conditions has been one of the most difficult, if not *the* most difficult, which could be met with in street railway work.

The excessive and continuous grades, the numerous and sharp curves, the gradients in these curves, the weight of the cars and the heavy loads which they have been required to carry, together with the extent of the system and the number of cars in operation, constitute the enterprise, the largest and most difficult of its character yet inaugurated in any part of the world.

We must confess that we have sometimes shared the doubts that others have been so free to express, as to the possibility of the successful completion of this work; and hence, it is with the greater pleasure that we acknowledge the successful fulfilment of all the terms and conditions of the contract, and compliment you upon having achieved so signal a success.

The immediate financial success of the road has been unquestionably due in a measure to the economy developed in the operation of your system as compared with any other method of street car propulsion,

We shall be pleased to meet your treasurer to-day, when we will make a full settlement as agreed. We are already contemplating an increase of equipment, and hope before the close of this year to have at least seventy of your cars in operation.

Yours very truly,

(*Signed*) THORNTON N. MOTLEY,
HENRY STEERS,
MAURICE B. FLYNN,
Committee on Construction.

The Deer Island (Mass.) prison is connected with the East Boston Central Telegraph Office by a submarine cable.

An average of three thousand calls are answered daily at the Central Telephone Office at Cambridge, Mass.

Mr. Peter Shields, the well-known lineman of Pittsburgh, Pa., has organized the firm of Shields, O'Rourke & Co., electrical contractors, and although a new concern, are meeting with success. They constructed the line for the Allegheny Electric Railway and the Asbury Park Electric Railway, and are now engaged in similar work at Meriden, Conn.

A paragraph appeared in this journal a month ago, copied from the *Times-Recorder* of Zanesville, Ohio, reflecting severely on the actions of Frank S. Mitchell of that city. We are in receipt of a letter from J. M. Rusk, managing editor of the *Times-Recorder*, which states that the facts were much exaggerated and do Mr. Mitchell an injustice.

Mr. Geo. E. Holbrook of the Western Union has received a handsome pocket knife from Mr. Walter Stevens of the Western Union Cable force, Penzance, Eng. Mr. Holbrook is justly proud of the gift, as it comes from a friend he has never seen.

Mr. Benj. F. Thompson, the electrician, formerly of the Western Union, Toledo, Ohio, is reported to be in a very low condition.

NOTES FROM 195.—How do you like our new dress? Tunis, better known as "Harry," Fisher, who only a month ago was called upon to mourn the loss of his mother, has met with another affliction in the death, a few days since, of his brother, at Fort Wayne, Ind. He has the sympathy of a host of friends. The removal of Clark's department to more commodious quarters in another part of the building makes room for twenty additional desks. J. F. Byrne has been added to the regular night force, *vice* Mr. Cholery, transferred to the 8 to 5:30 trick. Even on the warmest nights we have one and sometimes two Winders down in the city department. John Healy has been assigned to the Cleveland wire. "Jakey" Tuck who arrived here a short time since from Jacksonville, Fla., and found a place on the waiting list, has been transferred to Troy, N. Y., for a week to take report. Billy Leith, the picture of health, has returned from his vaction and once more occupies his old position with Billy Landy on the first Chicago. Peter Adams having returned from his trip to London, Ont., Joe Howey, who subbed for him at the *Times* office, has been transferred to the *Sun* bureau, *vice* George Hann, returned to the regular night force. A large number of men who absented themselves without leave the day after Sunday have been suspended for a month. If those who imagine City Line Chief Robinson and his worthy Assistant Keith have nothing to do would drop around some evening they would quickly learn their mistake. They are two of the busiest men in the room. Martin J. Dixon, of the split trick, has changed places for one week with S. Morrison of the 6 to 3 o'clock force. Mr. Richd. Waycott, one of the most popular traffic chiefs on the floor, is jubilant over the arrival at his house of a little girl. Geo. F. Allman has been transferred to the *Tribune* and George W. Irwin to the *Press* office to take specials. James N. Faulkner, one of the best known operators in the country, has been added to the waiting list. He is a recent arrival from the West and is employed here for the first time. Frank E. Ames, a former member of the night force and a universal favorite with all, after a brief visit in town has, on account of a return of his old symptoms of illness, returned to Dobbs Ferry, where he will for the present sub for the regular operator. It matters not how dull the season, the check boys' business is always picking up. Mr. Richard Powers, now a prosperous merchant in Hancock, N. Y., paid his old friends here a visit a few days ago for the first time since he left the profession in 1883. This is the way a dear old lady wired her daughter out in Jersey the other day: "Sarah: Come home at once. Clara is married." There are sixty-four men on the waiting list. The outlines on the wall in the city department resulting from the removal of the cloak, resembles most strikingly the outspread skin of a coon nailed to a barn to dry. Tommy Murphy, who for a long time past has worked the Pittsburg quad. days, has resigned to go with the Public Grain and Stock Exchange. His successor, Mr. Simmons, is the clever artist whose skill with the pen has been missed from the desk diaries during his absence in Jacksonville, Florida. Robert C. Edwards, late of the split trick, has returned to his first love, the 1 to 8 A. M. force. Wire Chief E. F. Howell rejoices over the arrival at his house of a little girl. J. H. Graham has been added to the regular night force, *vice* W. Walton, transferred to a day trick. Walter Perkins and Leslie Miller, both men of recognized ability in the theatrical profession, being temporarily out of an engagement, have caught on the waiting list. Harry DuSouchet's new play, "Dollars and Hearts," which is to be presented for the first time at Tony Pastor's theatre, Monday evening, June 18, bids fair to draw a good house even if his colleagues and their friends alone appear. The Corona, N. J., Improvement Society on May 22 elected Mr. E. M. Anson, the well-known operator, president.

TRANSFERS.—C. E. Bair, Oil Oity, Pa., to Chicago, Ill.; Chas. Smith, Shreveport, La., to Meridian, Miss.; H. D. Fisher, Ivor to Suffolk, Va.; G. W. Dull, Cleveland, O., to Pittsburg, Pa., for the Postal; Miss H. S. Potter, Brooklyn, to New York, for the Postal; J. J. Halligan, Brooklyn, to Williamsburg, N. Y.; Frank Hanley, Kingston, Ont., to Omaha, Neb., for the W. U.; John J. Madden, Orleans, Neb., to Winfield, Kans.; M. L. Smit, Caldwell to Reese, Kan., for the Missouri Pacific; D. F. Baker and L. J. Martin, W. U., to Postal, Cleveland, Ohio; A. E. Shear, Coeymans Junction, N. Y., to Boca, Cala.; M. Duke, Cleveland to Cincinnati, Ohio; T. Masters, Winnipeg, Man., to St. Paul, Minn.; J. H. Bright, Sacramento, Cal., to Virginia City; R. Allen, Virginia City to Carson, Nev., for V. & T. R. R.; E. Scott, Springvale, Me., to Farmington, N. H.; F. M. Johnson, Burke to Lyon Mountain, N. Y.; E. J. Leary, 195 Broadway, to 10 W. 23d street, for the Gold & Stock; E. W. Seiss, Roanoke, Va., to Mobile, Ala., for the M. & B. Ry. Co.; Geo. S. Bleakney, to Pittsburg, Pa.

BORN.—On May 25, at 7:30 P. M., at 92 Henry street, Brooklyn, N. Y., to the wife of R. I. Benning, a daughter.

T. J. Clark, manager of a telegraph college in Kansas City, Mo., according to the *News* of that city, occasionally lectured his pupils, at which times he had related them a little incident to the effect that he and Professor Samuel F. B. Morse had stretched the first telegraph line around the dome of the capitol at Washington, and exchanged the first telegraphic messages; that Congress had then appointed a committee to investigate as to whether the whole thing was not a sleight-of-hand exhibition. Mr. Clark, it is claimed, had also requested persons to place their hands upon his forehead to feel electric throbs, which he said, were at all times apparent.

Placing a cage and canary bird on the counter she said to the operator in charge of the W. U. office at Sioux City, Iowa: "I want this sent to Kansas City at once." The operator's hands were full for the next fifteen minutes explaining the difference between lightning and an express car.

Immediately an inventor receives a patent he is in receipt of hundreds of letters, circulars, etc., giving advice as to the best method of disposing of the same to the best advantage. The majority of these circulars are intended to defraud.

It is said that a contract between the Western Union and the Illinois Central has been practically closed for the construction of a first-class telegraph line from Dubuque to Sioux City and on all the branches.

The new switch-board recently placed in the Cambridge, Mass., Telephone office accommodates 500 wires. Mr. G. K. Wheeler is the manager of Cambridge division and is a well-known electrician.

Mr. Edward H. Goff has retired from the presidency of the American Electric Manufacturing Co. to devote his entire time to the New York *Daily Graphic*, of which he is president.

The fifth annual convention of the American Train Dispatchers' Association will be held in Louisville, Ky., June 12, 1888.

Mr. Anthony Reckenzaun, after spending nearly a year in America, has returned to England.

General Manager Sargent, of the N. Y. & N. J. Telephoe Co. has returned from Florida.

BOSTON NOTES.—Mr. D C. Devine of the W. U. all-night force has been transferred to the day force, succeeding Mr. H. A. McDonald on the Albany wire, the latter having been assigned to the Chicago duplex. Mr. Geo. Starkey of the night force, late of the B. & O., has changed places with Mr. J. P. Pendergast, days. Mr. J. F. Rankin has resigned. Mr. F. A. Doe is a recent addition to the night force. The AGE is much sought after by subscribers, and more so by non subscribers. The non-subscribers get there as well as the regular takers of your journal. This is to be deplored, as the amount charged for a year's subscription is very small and within the reach of every employee of the Boston office, but while subscribers will leave their papers behind relays, an excuse can be found by the non-subscribers not to take it, for who will buy an article when it can be got for nothing. I wish the people who pay for the AGE would take them home or keep them under cover. Business is beginning to boom, and in anticipation of the summer rush a quadruplex to Concord, N. H., and White River Junction is being set up This will improve the service on the White Mountain business, which is very heavy during the summer months, as the mountains are much sought after by health-seekers and people of wealth in general. It is needless to remark that telegraph operators are not among the latter class, although very often we find them among the former. Mr. Frank Stevens is superintending the setting up the new quads. He is also busy putting all the quads. in a new switch. While he is at this work his position at the switch is efficiently filled by Mr. Sam Nash, while Traffic Chief Tom Kelly presides over the work formerly performed by the genial Samuel. Mr. James Dougher is acting as traffic chief and has endeared himself to the boys by his courteous treatment and kindly manner while in the discharge of his duties. I tell you, it makes a hard job lighter when one is asked to do it, and not ordered or driven. I called on Eugene J. O'Connor one evening, and found him overhead in press matter in the editorial rooms of the Boston *Globe*. He was too busy he said, to talk, but I forgave him when he tendered me a cigar. He wished me to mention that he is doing well in his new undertaking, and expresses the belief that he has permanently retired from the telegraph business. He has the congratulations of his friends, who hope that he will not forget the boys who fought, bled and died with him in the days of yore. I am sorry to announce the illness of Mr T. J. Clifford, one of the most honored and respected members of the profession. His pleasant manner and uprightness has made hundreds of friends who join with me in the hope that he will soon be with us again.

During the absence of Mr. Clifford, Mr. Peter Van Allen holds forth on the cable quads very acceptably. He also has charge of the "ordering on" list, but in this respect his duties are light, as business has not increased enough to warrant extra help. R. A. Boyle and Chas. Flint have left the Postal office and departed for New York for the same company.

VIRGINIA CITY, NEV., NOTES.—In 1874 the repeaters for the overland wires and the repeating office for Neveda, were moved from Reno to Virginia City, Nev. This necessitated loops from Reno, Virginia City being twenty one miles south of the Central Pacific railway. Nearly every year or two there were rumors of a removal back to Reno, but it never came to anything more than a rumor, until now it is positively decided to make the change inside of a few weeks on account of the Wheatstone. The "mill" is now being worked between Ogden and San Francisco, but will hardly be able to attain a speed of over one hundred words until the repeaters are put in at Reno. Manager Shearer, now of the Virginia City office, will take charge at Reno, and will have besides the Wheatstone repeaters, two quads and a duplex East, and one quad and three duplexes West, besides a set of Millikens and about six Morse wires. The following comprises the force now at Virginia City: Ben. C. Shearer, manager; Miss H. B. Donohue and W. H. Murray, days; J. H. Bright, split trick; E. P. Blake, night chief; E. A. Kilbourne, all night, and Mrs Shearer, clerk. Business is quiet on account of the very sharp decline in mining stocks. During the month we had visits from Mr. Chris. Zabriskie of Candelaria, Nev., Mr. Jas. McGinnis of Reno, Nev., and Mr. Tom. Lee, train dispatcher for the C. P. R. at Ogden, Utah. Mr. Lee is an old time A. & P. operator at Virginia City.

KANSAS CITY NOTES.—Among the recent arrivals here are some ten lady operators, many of whom are to relieve male operators. Marvin Duff has taken John E. Ferris' place at the stock yards. Mr. Ferris has been transferred to another branch office on Delaware street. Business is still increasing here and more tables are being put in. Mr. Munz sends the base-ball scores from the grounds. Mr. Voorhees and Cunningham have gone to St. Louis. Once again the angel of love hovers over the W. U. office. This time it is one of the first-class operators and one of the Wheatstone girls.

American Train Dispatchers' Convention at Louisville, Ky. June 12.

ST. LOUIS NOTES.—W. B. Somerville is booke dto arrive about June 1st, with a retinue of scribes from New York and Washington. Simultaneously. The Boston *Globe* and New York *Herald* will each have four representatives on the field, and with their advent a lively time is anticipated, when thousands of words of specials will be filed each day until the convention closes. The late arrivals are: W. E Mayfield, Messrs. Tallis, O'Keefe Harris, Voorhees, McLaren, Campbell, Clarence Foote, Fenton and Earnesthousen. F. J. Kelly and L. M. Smith have gone to the Postal. Chief Topliff says he has a full force, and does not want any more men at present. Col. L. C. Baker says it will cost the Western Union over $6,000 to put their wires in the Exposition Building and get everything ready for handling the business of the Democratic Convention.

NEWARK, N. J., NOTES.—Mr. E. O. Alyea, the very popular assistant manager and chief operator of the Western Union at this place, was presented with a very handsome gold-headed cane and a box of very fine imported cigars, by the employees of his office, on his birthday, May 9th. The presentation was made in a novel way. When the time came one of the operators got up from his table and asked "Eddie" to take his place for a moment. Then Miss J. L. Reiners, at New York clicked an elaborate and witty presentation speech. He was so overwhelmed that he could not reply even by key.

LOUISVILLE NOTES.—M. E. Cunningham and J. J. Newkirk have resigned. Arrivals: Geo. M. Silvertooth from Memphis; F. Vanderveer. Frankfort, Ky.; Hildebrand, New Orleans; Gregg, Huntingburg Ind. Geo. F. Overton, formerly with the Standard Oil Co., this city, is now with the W. U. H. C. Pendlebury has been appointed manager of the new office at the K. & I. Stock Yards. Mr. W. H. Johnson, the electrician, has been appointed inspector of electric light wires by the mayor.

LOS ANGELES, CALA., NOTES.—The Western Union has moved into its new office, which was done without interruption to business. To Mr. Sloane belongs the credit of the excellent work. It is certainly the best office in the state, having all the modern improvements.

The Hoosac Tunnel division of the Order of Railroad Telegraphers was organized at North Adams, Mass., on May 17, by the election of the following officers: Chief telegrapher, Fred E. Gurney; assistant chief telegrapher, G. M. Rounds; secretary and treasurer, A. E. Ingraham; senior telegrapher, P. M. Mocklar; junior telegrapher, A. D. Wallace; inside sentinel, J. T. Shaughnessy; outside sentinel, G. M. Hawkes; past chief telegrapher, J. T. Keating.

Last Friday evening, Toledo Division of the Order of Railway Telegraphers elected the following officers for the ensuing year: Chief telegrapher, A. W. Meader; assistant chief telegrapher, W. P. Woelfer; senior telegrapher, E. G. Benskin; junior telegrapher, C. J. Hickox; secretary and treasurer, J. C. Harriman; inside sentinel, E. C. High; outside sentinel, George Blankemeier; past chief telegrapher, A. W. Brant.

The South Jersey Telegraph Company held its annual meeting in Camden Tuesday last and elected the following officers and directors: President, James Merrihew; secretary, Charles A. Jenke; treasurer, W. J. McLaughlin; superintendent, W. T. Westbrook; directors, Charles A. Tinker, W. B. Gill, James Merrihew, H. Bentley, S. M. Plush, W. T. Westbrook and George Merrihew.

The American Telephone and Telegraph Co. have been compelled to remove their wires off the highway between Somerville and Boston and to enter the city on the bank of the Boston and Lowell R. R.

The Brattleboro, Vt., Telephone Exchange is very busily engaged adding new subscribers to their central office and making general improvements. F. W. Childs & Co. are the managers.

The Philadelphia Electrical Society is investigating the cause of electric light fires and proposes to devise means of preventing them.

The Postal Telegraph Co. is now working through Somerville, Mass., on their four through wires from Boston to Portland, Me.

The City of Cambridge, Mass., has passed an ordinance prohibiting the telephone company from placing their wires on the electric light poles.

OLD MAN FINN.

BY WALTER P. PHILLIPS.

I saw him last summer, working a third-class wire in a western city. In reply to my inquiry, the chief operator informed me that Finn had been given employment the day before. I met the old boy on the stairs later in the day, and he said, in a weak voice, "Yes, I am back here again, what there is left of me. My drinking days are over, and I am about over too." He certainly looked bad, and I said to myself, "If consumption hasn't marked you for its own, your appearance belies you." My gaze went wandering away from him as he said sadly, "I can't telegraph very well any more. My hand shakes, and it is like sawing wood for me to work a wire—even a way wire." Then he left me and pursued his way up-stairs to the operating room. Old man Finn is not more than thirty-five years of age, but he has burned the candle at both ends, and his nervous system is fatally wrecked. He has fallen into a decline of late years, and there remains for him nothing, I fear, but the bitter dregs of existence.

Away back in the sixties, when I was a mere lad, endeavoring to master the mysteries of telegraphy, Finn was in his prime. He was regarded as one of the finest telegraphers in the country, and at the time I first knew him he had just completed his twenty-first year. I doubt if many young men who have their way to make in the world, attain their majority under fairer auspices than he did. Intelligent, fine-looking and the master of a profession which at that time was counted as one of the fine arts, almost, he had, apparently, an enviable future before him. Indeed, if I had been told in those dear old days that I would eventually reach what seemed in my boyish eyes a pinnacle of glory—such as he occupied—I should have been more surprised and pleased than I could be now over any prospect of future prosperity short of a tight hold on Paradise.

Somebody has recently written a poem in which two tramps figure. One inquires on meeting the other if there is no shade tree near at hand, and the second replies, "Yes, a little further down the road." The writer elaborates this idea, and says we are all tramps, looking for a shade tree. In his view it is always farther down the road, and but few of us ever reach it. The idea is well enough, but the view is too pessimistic to please me. I believe, on the contrary, that we are rather like children straying through a house in which there are many rooms of exquisite loveliness, each more beautiful than the preceding one. Outside of the mansion we think we would be content if we could gain the hall, but once within we stray on and on with thoughts intent upon the possibilities which lie beyond, and little heeding the increasing beauty of our surroundings since we left the threshold. It is better that we should sometimes consider the point from which we started. The experiment is consoling at all events, and makes us philosophic and more contented with our social status. There are not many of us who have made the most of our opportunities, who cannot say with the Christian of old: "O God, I have much to be thankful for!"

Old man Finn has not so much to be thankful for as many, and that he has thrown away his opportunities is to my mind the chief reason therefor. In the curt vernacular of Americans we often have the solution of a problem in one word. We hear of men in our own and other professions who have extraordinary abilities, kindly natures, and many traits of character calculated to endear them to their acquaintances. We are told, moreover, that they are at present "down in the world," "utterly used up," etc., and when we inquire the cause, the answer comes with painful regularity in that direful monosyllable, "Rum." Old man Finn's failure in life is also susceptible of explanation by the mention of that short, sad word. I do not mean to preach a temperance sermon. In writing a sketch, however, of a man whom I have known and admired, and through whose kindly aid I was launched on a career which I hope I may be pardoned for considering a moderately useful one, it will be necessary to cite a few facts. These facts stand for themselves. If they preach anything I cannot help it.

How old memories come crowding upon me as I recall a lovely Sunday in a June so far away that I instinctively look in the mirror to see "if the young boy is getting to be an old boy," and if "the hair is growing thin on the o boy's head!" I was early at the office that morning and was copying, with the idea of becoming an operator, the Morse alphabet from Shaffner's Manual. So engrossed was I with my work, and the difficulty I experienced in fixing my chubby fingers around a pen so as to come within speaking distance of making the characters conform to those in Shaffner, that I did not notice that some one had entered. As I was desperately struggling with the letter "J," and inwardly bewailing my lack of expertness with the pen, a voice which startled me at first, but which I recognized at once as Finn's, said: "Hop down off that stool, sonny, and I'll make you the alphabet." I quickly surrendered the task to the more experienced fingers of the new comer, who had been looking over my shoulder, and took my place on the messengers' bench. Presently Finn handed me a blank on which the alphabet, numerals and the punctuation points were given, and below them he had written in his own beautifully flowing chirography: "James Brady gave me his pretty black walnut box of quite small size." I bashfully expressed my thanks, but my heart was full enough of gratitude to have warranted something better than I said, had I been able to give utterance to my feelings. After answering a call and taking several messages, Finn started me out, saying as I went to deliver them, "You can practice on that sentence when you have learned to make the letters. It contains all the characters in the alphabet." I have given that little story about Brady and the small black-walnut box to many aspiring youngsters since then. I wonder if any of them ever prized it as highly as I did when it first became a part of my small stock of knowledge, and I wonder, too, if among that small band of youths, some of whom became operators, while others failed in that to succeed afterwards in other things, there is one who ever looked upon me as a half human, half divine personage, such as I regarded Finn. Probably not. But if there be one I am a much-honored man, for nothing I can feel for a human being will ever excel my enthusiasm for my old telegraphic hero. Even though I have seen him often of late years under circumstances which, for the moment, bereft him of all his old time glory, still I go on remembering him—bright, dashing and handsome, and am thankful that I can. Old man Finn is the stern reality to nearly all who know him now, but to me he is an abstraction merely—a realty which goes out of my mind, giving place to my hero of yore the moment he leaves my presence.

Before he had gone far on his downward course I had become an operator, and worked by his side. I remember that in one of his exalted moods he took the color out of my existence, for a month or more, by a casual observation which I can never forget. Like many young operators I fancied, long before I had perfected myself in my business, that I had solved the problem. I spoke in his presence to that effect one day, and he said, with that charming bluntness which is sometimes the result of an indulgence in stimulant:

"You will become a decent operator, but you are, of course, a frightful plug now." It cut me like a knife, but I needed the lesson. Years afterwards, when I had progressed as far in the telegraphic art as nature intended I should ever go, I looked back on those earlier years, and felt that Finn was right. I had finally been taught the bitter lesson which the great Newton confessed to have learned, and I felt that the little knowledge we acquire is valuable chiefly as teaching us the density of our ignorance.

Finn's character had a humorous vein in it, withal. His ability as a "receiver" was the talk and wonder of the whole

section in which he lived and wrought. He never broke, his work was accurate and his penmanship marvellous. One day an operator, who copied press on the same wire, visited us, and asked George how he managed to receive report day after day without ever breaking. Pointing to a primitive contrivance, consisting of two lumbering sounders and a quick switch fully four feet square, situated on a shelf several feet away, and which did duty as a repeater for Worcester, Finn replied dryly: "I do sometimes lose a word, but I have to watch that rat trap over there for Worcester's breaks, and if a word slips by me I can always spot it before it wiggles through that aged threshing machine."

The time came when Finn could no longer hold the responsible position of night report operator, and he went West. From that time out, until recently, he has returned to me at intervals varying from six months to two years. He plays the *role* of the "Friend of my Youth." He has invariably appeared without warning and uniformly in a state of impecuniosity. Sometimes he hailed from a New England town, where he had secured a month's "subbing," again he came from some obscure village on a branch of the Erie railroad, where he had been buried a year or two; anon he spoke of having just returned from Wyoming Territory, or of having last worked in Texas.

But his appearance, from what ever direction he came, always carried me back to the halcyon days of my youth, and invoked a vision of a brisk young man stepping out of his way to perform a kindly service for a round-faced country boy, come to the city to seek his fortune. That picture will always last. His wants have generally been modest, and I need scarcely add that his claims on me have never failed of recognition. If, in opening my purse, I have sometimes opened my lips and besought him to be a man, it is but common justice to him to say that he has invariably promised to mend his ways. But he has steadily gone down hill, and has well-nigh reached the bottom. I know better than scarcely any other man *can* know, how hard he has tried to retrace the steps taken, under social pressure, years ago, and which have led to his decadence, physically and intellectually. He has struggled against a cruel fate and has failed. It was with sincere sorrow that I last saw him pale, weak and emaciated. I judge that the old enemy is conquered at last; but it is too late. A more merciless enemy, one on whom we may exhaust strength of will in vain, is obviously preying upon his shattered frame.

Some day we shall read of his death, and the casual acquaintance will say: "Drank himself into the consumption. Poor fellow! he deserved a better end," and will think no more about him. But when the writer reads that announcement he will feel sad and grieved for many a day; for Finn was once kind to a boy whose catalogue of friends was limited enough then, and to whose eyes the tears will start unbidden when recurring Junes remind him that above the friend of his youth a mound rises on which the daisies bloom and the grass waves sadly in the summer air.

A JOURNALISTIC PICTURE GALLERY.

Among the collections of pictures at the Capitol at Washington, there is one which visitors are seldom privileged to see, but which is of as much interest as any in the great building. It is the collection of portraits in the ante-rooms of the press gallery of the House of Representatives. To Mr. C. H. Mann, who is in charge of the press gallery, belongs the credit of collecting these pictures for the adornment of the gallery. From a small beginning the collection has developed into one of significant value. It includes now almost thirty pictures, ranking from the modest photograph in a simple frame to a life-size picture in oils incased in ornamented gilt.

The proprietors and editors of the notable papers of the country are here in counterfeit presentments and the eagle eye of the able editor overlooks the work of the busy correspondent as he proceeds on his mission of moulding public sentiment and the telling of the doings of the law makers.

Directly opposite the entrance, at the further end of the room, is a modest crayon showing the benignant face of the editor-philanthropist, George W. Childs. Near by, and appropriately, is the portrait of the proprietor of Philadelphia's great penny *Record*, William M. Singerly. Then comes a life-size portrait, in oil, of the late W. F. Story, of the Chicago *Times*, which has the added interest of having been painted by his wife, and next comes Major Burke, of the New Orleans *Times-Democrat*, and Crosby Noyes, of the Washington *Star*. Handsome portraits of George Jones and Whitelaw Reid are close by.

On the other side of the room a modest photograph of Joseph Pulitzer is seen, and a large crayon shows the strong face of John R. McLean, of the Cincinnati *Enquirer*. The only Washington correspondent whose photograph has a place in the collection is Major M. P. Handy, chief of the New York *World* bureau here. His picture was placed there when he was a member of the corps of Philadelphia managing editors. Almost every editor of prominence in this country is fittingly represented. Boston is represented by small but strong pictures of Messrs. Pulsifer and Clapp.

The latest addition to the collection was made on Thursday. It is the life-size crayon of Walter P. Phillips, general manager of The United Press. It is on the right-hand of the entrance door of the first ante-room and occupies the place where for years the picture of General Grant hung. It rests immediately above the small enclosure occupied by the Western Union telegraph operators, and its location is very appropriate, as Mr. Phillips began life as an operator.—*Philadelphia Ledger*.

THE EDISON LABORATORY.—Edison's new laboratory at Orange, N. J., was thrown open to representatives of the press on May 11. The plant is one of the largest in the world. A large area is occupied, and there are five separate buildings of brick, with hard-wood interiors. The main one is three stories high, 200 feet deep, and 75 feet wide. There is a combination office and library in it, besides a lecture room, stock room, machine room, department rooms and power room. The structure is a model of its kind, and the equipment appears to be complete. The library and office is in the form of a hollow square, with three galleries rising to the third floor. The cases contain 16,000 volumes of choice scientific works, but the capacity is 35,000 books. Four one-story buildings, each 100x30 feet, are used for ore milling, blacksmithing, the manufacture of patterns, etc. There is a capacity of 320 horse-power in the steam plant, and electricity is supplied for 650 lamps on the premises and in neighboring dwellings.

The new management of the Metropolitan Telephone Company is now actively installed, and everything is moving with ease and precision. Mr. T. N. Vail is president; Mr. W. H. Eckert is general manager, and Mr. W. A. Vail general superintendent, with Mr. J. A. Seeley, electrician. Special attention is still being paid to the work of getting the wires underground all over the city, and the big switch-board every week shows signs of its approaching completion.

The fight which has existed for some time between the Western Union and Postal Telegraph companies, over the possession of the privilege of reporting baseball games from the grounds of the Philadelphia League Club, has resulted in a victory for the Postal Company, although the Western Union keep an operator on a pole across the street from the grounds, and manage to get the scores.

The Writing Telegraph Company propose to establish a factory at Bridgeport, Conn., where the apparatus will be made.

BUTTE, MONTANA, NOTES.—Quite a number of changes have taken place in this district since our last. S. M. McKee has resigned his position as superintendent of the Rocky Mountain Telegraph Co. He will probably locate in Colorado, in the oil business. Mr. McKee quits the business much to the regret of all who have ever worked for him. R. D. Ecker has resigned the managership of the Rocky Mountain Co. in this city and accepted a position in General Baldwin's office with U. P. R'y Co. He is succeeded by David More, with F. H. Roberts, assistant. John Mayo has left the U. P. and gone to Blue Bird Mine, three miles distant, where he takes a responsible position as bookkeeper. "Rastus" Young, assistant dispatcher of the Montana Union, has gone to Great Falls to work for the Manitoba R'y and is succeeded by Mr. J. L. Sawyer, late operator at Silver Bow. C. T. Day, manager for the R. M. Co. at Great Falls, has resigned and gone ranching two miles from the city. Tom Kennedy has been appointed chief linemen of the R. M. Tel. Co. for the northern district. *vice* O. F. W. Harvey, resigned. The W. U. is doing a large business in Montana, and Manager Greene deserves credit for the manner in which he handles such an amount of business with so few men as he has.

ST. LOUIS NOTES.—The W. U. main office was fumigated a few days ago in consequence of a rumor that operator Van Aldingham had been taken with small pox and removed to the hospital. It was afterwards learned that he had only the measles. About thirty operators were vaccinated by Dr. Ed Wells, an expert operator. It is to be hoped Chief Topliff will have the fumigation process repeated once a week. Colonel Clowry gave orders some time ago to reduce expenses in the operating department at this point, which has given birth to what has been dubbed the "skin back." Suppose an operator is off at 1 A. M. and is required and kept for extra service until 4 A. M. If on the following night business is slack, he is let off at 9 P. M. to balance the extra time put in the night previous. The scheme is appropriately named. But if the company has no opportunity to get back at the operator it pays him for the extra time. Much dissatisfaction is the result and steps are being taken by many good men to go where schemes of this nature do not exist. The national convention is looked forward to with pleasant anticipation by the wolves. Chief Topliff has just returned from an extended tour and looks the picture of health. The arrivals are, J. M. Ward, Dallas; Chas. Cloud, San Francisco; Pollock, Springfield; Weinert, Texas; Swan, Chicago; R. P. Smith, Cincinnati; Irons and Armstrong, New Orleans; C. E. Smith, Dye, Howe, Hughes and Goselin, Kansas City and Adam Sprow.

ATLANTA NOTES.—Manager Stephens is at his post of duty looking much better since his trip north. Mr. R. Holcomb is chief operator, assisted days by Mr. E E. Williams and Mr. E. W. Wood, traffic chief. The day force is composed of Messrs Alston, Benton, Caldwell, York, Dunn, Giddins, Bob Gill, Havis, Jones, Stephens, Turner, Woodson, Miss Cohen and "Mack" Hart. On split trick Mr. Alexander, late of New Orleans, Allen, Blau, Brown, Childress, Howze, Hughes and Kennedy. On the night force, Dr. P. E. Murray is still chief, with the following artists: Curran, Latimer, Sprenger, Wilson, Watson and Vandervender. Mr. M. F. Crist is still all night chief. Miss Cohen has returned from a few weeks' recreation in the country. The AGE is quite a favorite here.

CAMPBELLTON, N. B., NOTES.—The personnel of the dispatching office of the Intercolonial R'y is as follows: Evan Price, chief; H. H. Bray, J. C. Moore, L. S. Brown and W. A. Fitch, dispatchers; Chas. Russ, Jasper Davidson and R. Z. Walker, operators. The force at the Great North Western office has changed very little of late. R. McCord is manager; J. Vautier, J. C. Jardine and John Walsh, the latter late with the Western Union at Moncton, operators. J. R. Burns resigned on the first and is now with the W. U. at Moncton.

TORONTO NOTES.—On May 15 the G. N. W. & C. P. R. baseball forces played a game of ball, resulting in a victory for the latter by a score of 25 to 11. Messrs. Barber and Hill were pitcher and catcher respectively for the C. P. R., while Messrs. Davis and McCarthy were the battery for the G. N. W. Mr. Charles Graham, of the Toronto end of the Montreal quadruplex, in the C. P. office, was married a few days ago to Miss Guest, also of this place. Mr. Geo. A. Sinclair has been transferred from the Montreal to the Toronto office. Mr. J. B. Rogers, of the G. N. W., has the sympathy of a large circle of acquaintances in the loss of his mother, who died on May 14.

CHATTANOOGA NOTES.—The Western Union office has been newly painted and otherwise fixed up since the fire of a few months ago. Mr. Condra has returned from Anniston, Ala., and is subbing for Mr. Pemberton, who left for Virginia on account of the illness of his mother. Mr. C. R. Zacharius, manager of the Birmingham, Ala., office, gave us a call recently. Mr. Eubanks, our popular lineman, has been sick for the past two weeks at his home in Kingston, Ga.

NEW ORLEANS NOTES.—Mr. Carl Weiderman has gone north; Benjamin, to his home in Bloomington, Ills.; Willhoite, Tennessee. Wm. Allen has been added to the force, and Birkner, Sands and Flynn have been placed permanently. Owing to the continued ill health of Mr. A. W. Cain, our assistant night chief, he has been granted a two months' leave of absence, and has left for Kokomo, Ind., his home. Mr. Joseph O'Leary now our all-night man.

HAZELTON, PA., NOTES.—At Hazelton, Pa., the Lehigh Valley Railroad has four offices, which contain H. K. Conner, chief despatcher, with Messrs. Bruch and Rudimon, day-train runners, and Wm. Love, night operator. Mr. Balliet is now manager for the Western Union, Wm. Collins having recently resigned and removed to New York. Mr. Balliet is recently from New Jersey. Arthur Morgan is on days and Frankie Hoag nights. Mr. D. O. Lynch and Tenstermacher days and nights, respectively, for the Lehigh Valley.

PORTLAND, ME., NOTES.—The force at present consists of manager Charles D. Livermore, chief operator, Charles H. Stevens, Charles H. O'Brion, Kerwin W. Starbird, Frank Leslie Welt, Charles M. Berry, Herbert F. Woodward, William F. Cassidy, Walter H. Coffin and Miss Josie L. Bailey from 8 a. m. to 6 p. m. Night manager E. Eugene Eastman attends to the welfare of the office after 6 p. m., assisted by Thomas A. Donahue, Howard M. Breen, and as many of the day force as business requires. Mr. Edward C. Jackson of Danville is subbing for Mr. O'Brion, who is rusticating at Hallowell. Mr. O'Brion and Mr. Breen are the inventors of several useful electrical devices. Mr. John J. Gibbons, who was left when the B. & O. was absorbed by the W. U., is making himself useful as a "sub." Mr. Harry H. White, formerly of this office, has recently come forward as a writer of fiction, his first production appearing in one of the best and most popular weeklies of the state.

A division of the Railroad Telegraphers of North America was organized at Worcester, Mass., last week, by S. H. Brown, of West Medford. There are but two other divisions in New England, but the order is very strong in the west. The name adopted was Quinsigamond Division, and the officers are as follows: Alton Beers, chief telegrapher; D. W. Parkhurst, assistant chief telegrapher; A. H. Parker, secretary and treasurer; A. D. Johnson, senior telegrapher; F. A. Paige, junior telegrapher; H. D. Moore, inside sentinel; Thomas McHugh, outside sentinel; R. P. Jones, past chief telegrapher. The division starts off with 23 members, and will have regular stated meetings.

For the past month one of the Western Union wires running into Hanover, N. H., has been seriously disabled. Business has been delayed and expert linemen have at various times made examinations of the line between there and White River Junction, but were unable to locate the break. J. N. Landon, foreman of the Western Union, following the wire carefully, found a hair copper wire attached to the main line running along under a roof for fifteen feet and then into the room of G. P. Bryant, of Chateaugay, N. Y., a Dartmouth Freshman. In this way the Amateur Telegraph Company, which has instruments in many students' rooms, has been receiving the benefit of the messages of the Western Union. Prosecution is only a question of a few days, when the ambitious of a disciple of Morse will be called to answer for his undue zeal before a court of justice.

A POPULAR TELEGRAPH OPERATOR.—Mr. Roger J. Mullen, for the past twenty years an employee of the Great North Western Telegraph Company at Toronto, Ont., was on May 12, presented with an address and gold-headed cane and a beautiful diamond pin as a token of the high estimation formed of him by his fellow employees, on the occasion of his leaving for Chicago to take a more lucrative position with the Western Union Telegraph Company of that city. Mr. Rogers read the address and Miss Mitchell made the presentation. The address and presentation came so unexpectedly upon Mr. Mullen that he was robbed of language to express his appreciation of the kindness bestowed upon him, and with deep emotion he thanked them heartily. He was sorry to leave old and kinds friends, but would remember them in his new field of labor.

H. A. Jackson

THE ELECTRIC AGE.

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

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WALTER P. PHILLIPS, Editor.
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NEW YORK, JUNE 16, 1888.

SIGNAL SERVICE THERMOMETERS.—A special dispatch from Washington says : The signal service is about to introduce in the principal cities self-registering thermometers. These thermometers will be connected by means of electricity with the dial that will be conspicuously posted on the outside of the weather buildings, and will record the temperature at the top of the building as indicated by the signal service thermometers. The dials will be useful and of great convenience to the public, who will thus have a ready means of knowing the official temperature without climbing to the tops of the high buildings where the offices are usually placed.

Mr. Wm. Maver, Jr., the well-known electrician, has completed a series of interesting articles on "Improvements in the Quadruplex." They appeared in the *Electrical World* May 19th, May 26th and June 2d. Mr. F. W. Jones, of the Postal Company, criticises at length, in the same journal, a number of statements made by Mr. Maver, and avers that he differs with him historically and electrically. Mr. Jones gives many dates and facts to prove his assertions, and declares in emphatic language that to Mr. Thomas A. Edison belongs the entire credit of making the quadruplex of commercial value.

Electrician Burke of this city has so far perfected his new system of cable transmission as to attain a speed of 27 words a minute on the short end of one of the Direct cables. Mr. Burke has given this subject his undivided attention for many years, and it is the opinion of a cable expert that he has at last succeeded in attaining the desired object. He proposes to substitute Morse signals in place of the work performed at present by the mirror and recorder instruments.

At the annual meeting of the Mutual District Messenger Company of Boston last week the following gentlemen were chosen directors : Frederick L. Ames, James M. Prendergast, Allen S. Weeks, Thomas Roche, Otis Kimball, D. J. Hern and Parker C. Chandler, of Boston, and Charles A. Tinker and Thomas T. Eckert of New York. Mr. Weeks was chosen treasurer and clerk.

BUSINESS NOTICES.

Mr. Chas. J. Kintner, whose advertisement appears in another column, has recently formed a partnership with Mr. John A. Wiedersheim, and hereafter the firm will be known as Wiedersheim and Kintner, with offices at 45 Broadway, this city. Carl Hering, the well-known electrician, is consulting electrical expert for the firm, which has its full share of business. The fact that for three years Mr. Kintner was principal examiner in charge of electricity in the United States Patent Office is evidence sufficient to account for his great success. Hon. L. Q. C. Lamar, Secretary of the Interior, in accepting Mr. Kintner's resignation, wrote: "Your reputation as an electrical expert is high, not only in the department, but outside. I wish you success in your new business." The firm is now fully prepared to give opinions upon all matters requiring electrical expert knowledge ; to make searches concerning the novelty of, and practical tests relative to, the operativeness and efficiency of electrical inventions.

THE WELSBACH LIGHT.—The headquarters of the Welsbach Incandescent Gas Light Company of this city, at 13 W. 27th street, were visited a few days ago by an ELECTRIC AGE reporter. A perfected Bunsen burner is used in this system, the flame being covered by a hood which is made as follows : , A tube-like network of cotton about two inches in circumference is prepared by a knitting machine and is cut into lengths of five or six inches ; each length is fastened to a platinum wire and suspended in a solution of lanthanum, zirconium and yttria until thoroughly saturated. The pieces are then dried and the cotton is entirely burnt away, leaving a hood composed of the refractory metals. This is fitted to a Bunsen burner and the Welsbach apparatus is complete and can be substituted for an ordinary burner in five minutes. The heat of the gas renders the metallic hood incandescent, giving a steady, pure, white light. No vacuum is used. A Welsbach burner will give the same amount of light as a regular burner, while using but half the amount of gas. It is claimed that the cost of the burners is soon compensated for by the difference in the amount of gas consumed.

The Edison Electric Light Company is about to enter the up-town field as a competitor of the United States Company, and there is a cheering prospect of lower prices. The Edison Company has its wires in the electrical subways that were laid a year ago, and is building two big stations, one in Thirty-ninth street, the other in Twenty-sixth street, near Sixth avenue. Both are handsome brick structures. They will be completed and fitted with machinery all ready for operation some time in August. Houses that have hitherto been deterred from the use of electricity by the high tariff of the United States Company are already putting in the Edison fixtures in anticipation of a reduced rate.

A dispatch from St. Thomas, Ont., says : "A representative of the Order of Railroad Telegraphers has been making a tour over the Michigan Central Railway for the past few days, inducing operators to become members of the association, and as a result nearly every operator of the road has joined the order. The object of the association is for mutual protection, every member pledging himself that he won't teach the art to others. Superintendent Morford, however, is opposed to the brotherhood, and on Saturday telegraphed an order to all operators requesting them to at once withdraw from the association, intimating that unless they did so they would be relieved from further duty. The order created great excitement among the operators, many of whom say they will not withdraw but will stand firm to the brotherhood. P. G. Bromley, at Tilsonburg, for many years past an old operator, joined the association, and on being requested by Mr. Morford to withdraw, refused and has been discharged. It is difficult to say how the affair will terminate."

A NEW SYSTEM OF ALTERNATE CURRENT MOTORS AND TRANSFORMERS.

BY NIKOLA TESLA.

In the presence of the existing diversity of opinion regarding the relative merits of the alternate and continuous current systems, great importance is attached to the question whether alternate currents can be successfully utilized in the operation of motors. The transformers, with their numerous advantages, have afforded us a relatively perfect system of distribution, and although, as in all branches of the art, many improvements are desirable, comparatively little remains to be done in this direction. The transmission of power, on the contrary, has been almost entirely confined to the use of continous currents, and notwithstanding that many efforts have been made to utilize alternate currents for this purpose, they have, up to the present, at least as far as known, failed to give the result desired. Of the various motors adapted to be used on alternate current circuits the following have been mentioned: 1. A series motor with subdivided field. 2. An alternate current generator having its field excited by continuous currents. 3. Elihu Thomson's motor. 4. A combined alternate and continuous current moror. Two more motors of this kind have suggested themselves to me. 1. A motor with one of its circuits in series with a transformer and the other in the secondary of the transformer. 2. A motor having its armature circuit connected to the generator and the field coils closed upon themselves. These, however, I mention only incidentally.

The subject which I now have the pleasure of bringing to your notice is a novel system of electric distribution and transmission of power by means of alternate currents, affording peculiar advantages, particularly in the way of motors, which I am confident will at once establish the superior adaptability of these currents to the transmission of power and will show that many results heretofore unattainable can be reached by their use; results which are very much desired in the practical operation of such systems and which cannot be accomplished by means of continuous currents.

Before going into a detailed description of this system, I think it necessary to make a few remarks with reference to certain conditions existing in continuous current generators and motors, which, although generally known, are frequently disregarded.

In our dynamo machines, it is well known, we generate alternate currents which we direct by means of a commutator, a complicated device and, it may be justly said, the source of most of the troubles experienced in the operation of the machines. Now, the currents so directed cannot be utilized in the motor, but they must—again by means of a similar unreliable device—be reconverted into their original state of alternate currents. The function of the commutator is entirely external, and in no way does it affect the internal working of the machines. In reality, therefore, all machines are alternate current machines, the currents appearing as continuous only in the external circuit during their transit from generator to motor. In view simply of this fact, alternate currents would commend themselves as a more direct application of electrical energy, and the employment of continuous currents would only be justified if we had dynamos which would primarily generate, and motors which would be directly actuated by such currents.

But the operation of the commutator on a motor is two fold; firstly, it reverses the current through the motor, and secondly, it effects, automatically, a progressive shifting of the poles of one of its magnetic constituents. Assuming, therefore, that both of the useless operations in the system, that is to say, the directing of the alternate currents on the generator and reversing the direct currents on the motor, be eliminated, it would still be necessary, in order to cause a rotation of the motor, to produce a progressive shifting of the poles of one of its elements, and the question presented

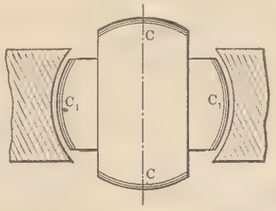


Fig. 1.

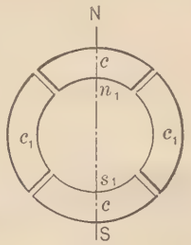


Fig. 1a.

itself,—How to perform this operation by the direct action of alternate currents? I will now proceed to show how this result was accomplished.

In the first experiment a drum-armature was provided with two coils at right angles to each other, and the ends of these coils were connected to two pairs of insulated contact-rings as usual. A ring was then made of thin insulated plates of sheet-iron and wound with four coils, each two opposite coils being connected together so as to produce free poles on diametrically opposite sides of the ring. The remaining free ends of the coils were then connected to the contact-rings of the generator armature so as to form two independent circuits, as indicated in figure 9.

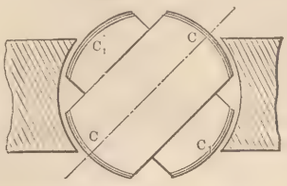


Fig. 2.

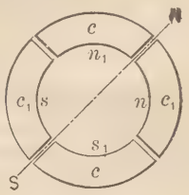


Fig. 2a.

It may now be seen what results were secured in this combination, and with this view I would refer to the diagrams, figures 1 to 8*a*. The field of the generator being independently excited, the rotation of the armature sets up currents in the coils C C, varying in strength and direction in the well-known manner. In the position shown in figure 1 the current in coil C is nil while coil C1 is traversed by its maximum current, and the connections may be such that the ring is magnetized by the coils *c*1 *c*1 as indicated by the letters N S in figure 1*a*, the magnetizing effect of the coils *c c* being nil, since these coils are included in the circuit of coil C.

In figure 2 the armature coils are shown in a more advanced position, one-eighth of one revolution being completed. Figure 2*a* illustrates the corresponding magnetic condition of the ring. At this moment the coil C1 generates a current of the same direction as previously, but weaker, producing the poles *n*1 *s*1 upon the ring; the coil C also generates a current of the same direction, and the connections may be such that the coils *c c* produce the poles *n s*, as shown in figure 2*a*. The resulting polarity is indicated by the letters N S, and it will be observed that the poles of the ring have been shifted one-eighth of the periphery of the same.

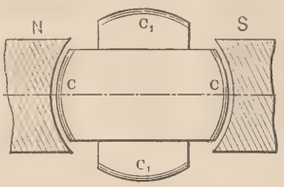


Fig. 3.

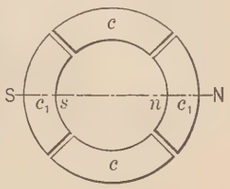


Fig. 3a.

In figure 3 the armature has completed one-quarter of

one revolution. In this phase the current in coil C is maximum, and of such direction as to produce the poles N S in figure 3*a*, whereas the current in coil C1 is nil, this coil being at its neutral position. The poles N S in figure 3*a* are thus shifted one-quarter of the circumference of the ring.

Figure 4 shows the coils C C in a still more advanced position, the armature having completed three-eigths of one revolution. At that moment the coil C still generates a current of the same direction as before, but of less strength, producing the comparatively weaker poles *n s* in figure 4*a*. The current in the coil C1 is of the same strength, but of opposite direction. Its effect is, therefore, to produce upon the ring the poles *n*1 and *s*1 as indicated, and a polarity, N

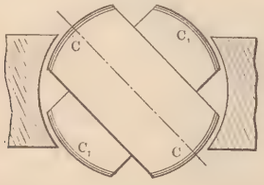


Fig. 4.

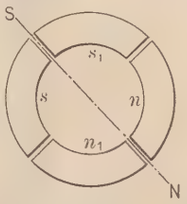


Fig. 4 a.

S, results, the poles now being shifted three-eighths of the periphery of the ring.

In figure 5 one-half of one revolution of the armature is completed, and the resulting magnetic condition of the ring is indicated in figure 5*a*. Now, the current in coil C is nil, while the coil C1 yields its maximum current, which is of the same direction as previously ; the magnetizing effect is, therefore, due to the coils *c*1 *c*1 alone, and, referring to figure 5*a*, it will be observed that the poles N S are shifted one-half of the circumference of the ring. During the next half revolution the operations are repeated, as represented in the figures 6 to 8*a*.

A reference to the diagrams will make it clear that during one revolution of the armature the poles of the ring are

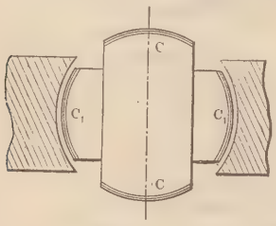


Fig. 5.

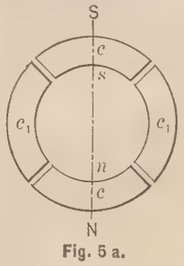


Fig. 5 a.

shifted once around its periphery, and each revolution producing like effects, a rapid whirling of the poles in harmony with the rotation of the armature is the result. If the connections of either one of the circuits in the ring are reversed, the shifting ot the poles is made to progress in the opposite direction, but the operation is identically the same. Instead of using four wires, with like result, three wires may be used, one forming a common return for both circuits.

This rotation or whirling of the poles manifests itself in a series of curious phenomena. If a delicately pivoted disc of steel or other magnetic metal is approached to the ring it is set in rapid rotation, the direction of rotation varying with

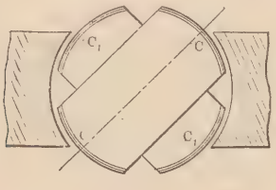


Fig. 6.

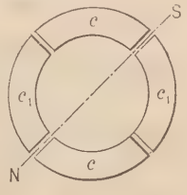


Fig. 6 a.

the position of the disc. For instance, noting the direction outside of the ring it will be found that inside the ring it turns in an opposite direction, while it is unaffected if placed in a position symmetrical to the ring. This is easily explained. Each time that a pole approaches it induces an opposite pole in the nearest point on the disc, and an attraction is produced upon that point ; owing to this, as the pole is shifted further away from the disc a tangential pull is exerted upon the same, and the action being constantly repeated, a more or less rapid rotation of the disc is the result. As the pull is exerted mainly upon that part which is nearest to the ring, the rotation outside and inside, or right and left, respectively, is in opposite directions, figure 9. When placed symmetrically to the ring, the pull on opposite sides of the disc being equal, no rotation results. The action is based on the magnetic inertia of the iron ; for this reason a disc of hard steel is much more affected than a disc of soft iron, the latter being capable of very rapid variations of magnetism. Such a disc has proved to be a very useful instrument in all these investigations, as it has enabled me to detect any irregularity in the action. A curious effect is also produced upon iron filings. By placing some upon a paper and holding them externally quite close to the ring they are set in a vibrating motion, remaining in the same place, although the paper may be moved back and forth ; but in lifting the paper to a certain height which seems to be dependent on the intensity of the poles and the speed of rotation, they are thrown away in a direction always opposite to the supposed movement of the poles. If a paper with filings is put flat upon the ring and the current turned on suddenly, the existence of a magnetic whirl may be easily observed.

To demonstrate the complete analogy between the ring and a revolving magnet, a strongly energized electro-magnet was rotated by mechanical power, and phenomena identical in every particular to those mentioned above were observed.

Obviously, the rotation of the poles produces corresponding inductive effects and may be utilized to generate cur-

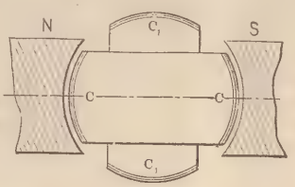


Fig. 7.

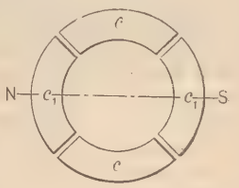


Fig. 7 a.

rents in a closed conductor placed within the influence of the poles. For this purpose it is convenient to wind a ring with two sets of superimposed coils forming respectively the primary and secondary circuits, as shown in figure 10. In order to secure the most economical results the magnetic circuit should be completely closed, and with this object in view the construction may be modified at will.

The inductive effect exerted upon the secondary coils will be mainly due to the shifting or movment of the magnetic action ; but there may also be currents set up in the

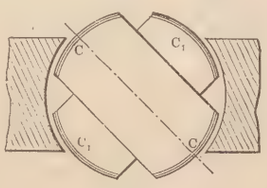


Fig. 8.

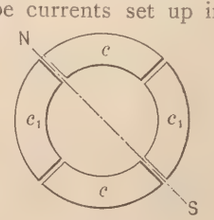


Fig. 8 a.

circuits in consequence of the variations in the intensity of the poles. However, by properly designing the generator and determining the magnetizing effect of the primary coils, the latter element may be made to disappear. The intensity of the poles being maintained constant, the action of the apparatus will be perfect, and the same result will be secured

as though the shifting were effected by means of a commutator with an infinite number of bars. In such case the theoretical relation between the energizing effect of each set of primary coils and their resultant magnetizing effect may be expressed by the equation of a circle having its centre coinciding with that of an orthogonal system of axes, and in which the radius represents the resultant and the co-ordinates both of its components. These are then respectively the sine and cosine of the angle a between the radius and one of the axes ($O\ X$). Referring to figure 11, we have $r^2 = x^2+y^2$; where $x = r \cos a$, and $y = r \sin a$.

Assuming the magnetizing effect of each set of coils in the transformer to be proportional to the current—which

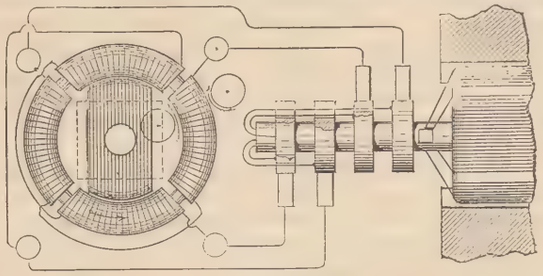


Fig. 9.

may be admitted for weak degrees of magnetization—then $x = K c$ and $y = K c'$, where K is a constant and c and c' the current in both sets of coils respectively. Supposing, further, the field of the generator to be uniform, we have for constant speed $c_1 = K' \sin a$ and $c = K' \sin (90^\circ + a) = K' \cos a$, where K' is a constant. See figure 12.

Therefore, $x = K c = K K' \cos a$;
$y = K c' = K K' \sin a$, and
$K K' = r$.

That is, for a uniform field the disposition of the two coils at right angles will secure the theoretical result, and the intensity of the shifting poles will be constant. But from $r^2 = x^2+y^2$ it follows that for $y = 0$, $r = x$; it follows that the joint magnetizing effect of both sets of coils should be equal to the effect of one set when at its maximum action. In transformers and in a certain class of motors the fluctuation of the poles is not of great importance, but in another class of these motors it is desirable to obtain the theoretical result.

In applying this principle to the construction of motors, two typical forms of motor have been developed. First, a form having a comparatively small rotary effort at the start, but maintaining a perfectly uniform speed at all loads, which motor has been termed synchronous. Second, a form possessing a great rotary effort at the start, the speed being dependent on the load.

These motors may be operated in three different ways: 1. By the alternate currents of the source only. 2. By a combined action of these and of induced currents. 3. By the joint action of alternate and continuous currents.

The simplest form of a synchronous motor is obtained by winding a laminated ring provided with pole projections with four coils, and connecting the same in the manner before indicated. An iron disc having a segment cut away on each side may be used as an armature. Such a motor is shown in Figure 9. The disc being arranged to rotate freely within the ring in close proximity to the projections, it is evident that as the poles are shifted it will, owing to its tendency to place itself in such a position as to embrace the greatest number of the lines of force, closely follow the movement of the poles, and its motion will be synchronous with that of the armature of the generator; that is, in the peculiar disposition shown in figure 9, in which the armature produces by one revolution two current impulses in each of the circuits. It is evident that if, by one revolution of the armature, a greater number of impulses is produced, the speed of the motor will be correspondingly increased. Considering that the attraction exerted upon the disc is greatest when the same is in close proximity to the poles, it follows that such a

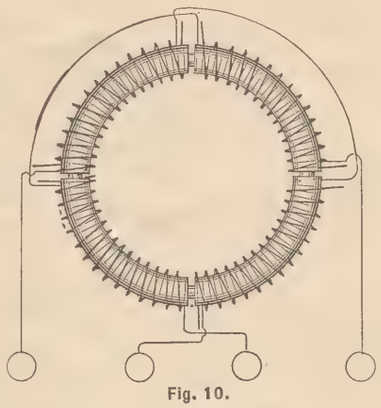


Fig. 10.

motor will maintain exactly the same speed at all loads within the limits of its capacity.

To facilitate the starting, the disc may be provided with a coil closed upon itself. The advantage secured by such a coil is evident. On the start the currents set up in the coil strongly energize the disc and increase the attraction exerted upon the same by the ring, and currents being generated in the coil as long as the speed of the armature is inferior to that of the poles, considerable work may be performed by such a motor even if the speed be below normal. The intensity of the poles being constant, no currents will be generated in the coil when the motor is turning at its normal speed.

Instead of closing the coil upon itself, its ends may be connected to two insulated sliding rings, and a continuous current supplied to these from a suitable generator. The proper way to start such a motor is to close the coil upon itself until the normal speed is reached, or nearly so, and then turn on the continuous current. If the disc be very strongly energized by a continuous current the motor may not be able to start, but if it be weakly energized, or generally so that the magnetizing effect of the ring is preponderating, it will start and reach the normal speed. Such a motor will maintain absolutely the same speed at all loads. It has also been found that if the motive power of the generator is not excessive, by checking the motor the speed of the generator is diminished in synchronism with that of the motor. It is characteristic of this form of motor that it cannot be reversed by reversing the continuous current through the coil.

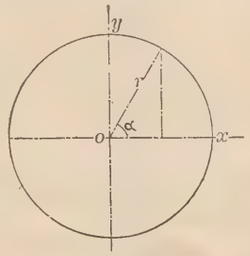


Fig. 11.

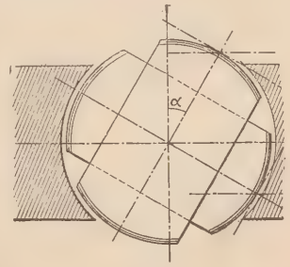


Fig. 12.

The synchronism of these motors may be demonstrated experimentally in a variety of ways. For this purpose it is best to employ a motor consisting of a stationary field magnet and an armature arranged to rotate within the same, as indicated in figure 13. In this case the shifting of the poles of the armature produces a rotation of the latter in the opposite direction. It results therefrom that when the normal speed is reached, the poles of the armature assume fixed positions relatively to the field magnet and the same is magnetized by induction, exhibiting a distinct pole on each

of the pole-pieces. If a piece of soft iron is approached to the field magnet it will at the start be attracted with a rapid vibrating motion produced by the reversals of polarity of the magnet, but as the speed of the armature increases the vibrations become less and less frequent and finally entirely cease. Then the iron is weakly but permanently attracted, showing that the synchronism is reached and the field magnet energized by induction.

The disc may also be used for the experiment. If held quite close to the armature it will turn as long as the speed of rotation of the poles exceeds that of the armature ; but when the normal speed is reached, or very nearly so, it ceases to rotate and is permanently attracted.

A crude but illustrative experiment is made with an incandescent lamp. Placing the lamp in circuit with the continuous current generator, and in series with the magnet coil, rapid fluctuations are observed in the light in consequence of the induced currents set up in the coil at the start ; the speed increasing, the fluctuations occur at longer intervals, until they entirely disappear, showing that the motor has attained its normal speed.

A telephone receiver affords a most sensitive instrument ; when connected to any circuit in the motor the synchronism may be easily detected on the disappearance of the induced currents.

In motors of the synchronous type it is desirable to

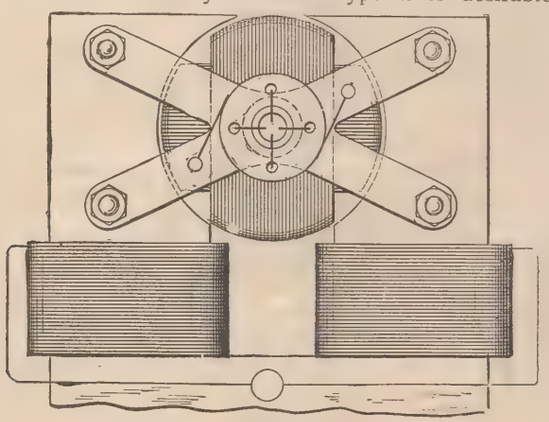


Fig. 13.

maintain the quantity of the shifting magnetism constant, especially if the magnets are not properly subdivided.

To obtain a rotary effort in these motors was the subject of long thought. In order to secure this result it was necessary to make such a disposition that while the poles of one element of the motor are shifted by the alternate currents of the source, the poles produced upon the other element should always be maintained in the proper relation to the former, irrespective of the speed of the motor. Such a condition exists in a continous current motor ; but in a synchronous motor, such as described, this condition is fulfilled only when the speed is normal.

The object has been attained by placing within the ring a properly subdivided cylindrical iron core wound with several independent coils closed upon themselves. Two coils at right angles as in figure 14, are sufficient, but a greater number may be advantageously employed. It results from this disposition that when the poles of the ring are shifted, currents are generated in the closed armature coils. These currents are the most intense at or near the points of the greatest density of the lines of force, and their effect is to produce poles upon the armature at right angles to those of the ring, at least theoretically so ; and since this action is entirely independent of the speed—that is, as far as the location of the poles is concerned—a continuous pull is exerted upon the periphery of the armature. In many respects these motors are similar to the continuous current motors. If load is put on, the speed, and also the resistance of the motor, is diminished and more current is made to pass through the energizing coils, thus increasing the effort. Upon the load being taken off, the counter-electromotive force increases and less current passes through the primary or energizing coils. Without any load the speed is very nearly equal to that of the shifting poles of the field magnet.

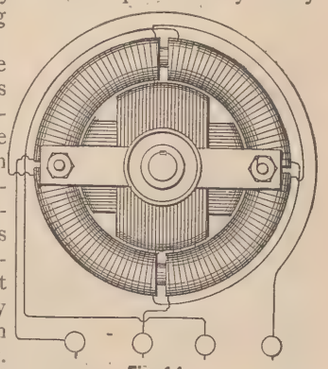


Fig. 14.

It will be found that the rotary effort in these motors fully equals that of the continuous current motors. The effort seems to be greatest when both armature and field magnet are without any projection ; but as in such dispositions the field cannot be very concentrated, probably the best results will be obtained by leaving pole projections on one of the elements only. Generally, it may be stated that the projections diminish the torque and produce a tendency to synchronism.

A characteristic feature of motors of this kind is their capacity of being very rapidly reversed. This follows from the peculiar action of the motor. Suppose the armature to be rotating and the direction of rotation of the poles to be reversed. The apparatus then represents a dynamo machine, the power to drive this machine being the momentum stored up in the armature and its speed being the sum of the speeds of the armature and the poles. If we now consider that the power to drive such a dynamo would be very nearly proportional to the third power of the speed, for this reason alone the armature should be quickly reversed. But simultaneously with the reversal another element is brought into action, namely, as the movement of the poles with respect to the armature is reversed, the motor acts like a transformer in which the resistance of the secondary circuit would be abnormally diminished by producing in this circuit an additional electromotive force. Owing to these causes the reversal is instantaneous.

If it is desirable to secure a constant speed, and at the same time a certain effort at the start, this result may be easily attained in a variety of ways. For instance, two armatures, one for torque and the other for synchronism, may be fastened on the same shaft, and any desired preponderance may be given to either one, or an armature may be wound for rotary effort, but a more or less pronounced tendency to synchronism may be given to it by properly constructing the iron core ; and in many other ways.

As a means of obtaining the required phase of the currents in both the circuits, the disposition of the two coils at right angles is the simplest, securing the most uniform action ; but the phase may be obtained in many other ways, varying with the machine employed. Any of the dynamos at present in use may be easily adapted for this purpose by making

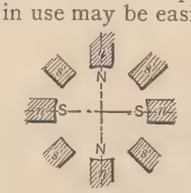


Fig. 15.

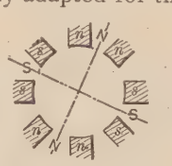


Fig. 16.

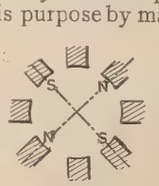


Fig. 17.

connections to proper points of the generating coils. In closed circuit armatures, such as used in the continuous current systems, it is best to make four derivations from equidistant points or bars of the commutator, and to connect the same to four insulated sliding rings on the shaft. In this

case each of the motor circuits is connected to two diametrically opposite bars of the commutator. In such a disposition the motor may also be operated at half the potential and on three-wire plan, by connecting the motor circuits in the proper order to three of the contact rings.

In multipolar dynamo machines, such as used in the converter systems, the phase is conveniently obtained by winding upon the armature two series of coils in such a manner that while the coils of one set or series are at their maximum production of current, the coils of the other will be at their neutral position, or nearly so, whereby both sets of coils may be subjected simultaneously or successively to the inducing action of the field magnets.

Generally the circuits in the motor will be similarly disposed, and various arrangements may be made to fulfill the requirements ; but the simplest and most practicable is to arrange primary circuits on stationary parts of the motor, thereby obviating, at least in certain forms, the employment of sliding contacts. In such a case the magnet coils are connected alternately in both the circuits ; that is, 1, 3, 5 . . . . in one, and 2, 4, 6 . . . . in the other, and the coils of each set of series may be connected all in the same manner, or alternately in opposition ; in the latter case a motor with half the

Fig. 18.

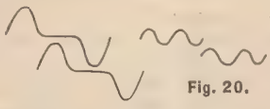


Fig. 19.

Fig. 20.

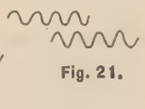


Fig. 21.

number of poles will result, and its action will be correspondingly modified. The figures 15, 16 and 17, show three different phases, the magnet coils in each circuit being connected alternately in opposition. In this case there will be always four poles, as in figures 15 and 17, four-pole projections will be neutral, and in figure 16 two adjacent pole projections will have the same polarity. If the coils are connected in the same manner there will be eight alternating poles, as indicated by the letters n^1 s^1 in figure 15.

The employment of multipolar motors secures in this system an advantage much desired and unattainable in the continuous current system, and that is, that a motor may be made to run exactly at a predetermined speed irrespective of imperfections in construction, of the load, and, within certain limits, of electromotive force and current strength.

In a general distribution system of this kind the following plan should be adopted. At the central station of supply a generator should be provided having a considerable number of poles. The motors operated from this generator should be of the synchronous type, but possessing sufficient rotary effort to insure their starting. With the oberservance of proper rules of construction it may be admitted that the speed of each motor will be in some inverse proportion to its size, and the number of poles should be chosen accordingly. Still exceptional demands may modify this rule. In view of this, it will be advantageous to provide each motor with a greater number of pole projections or coils, the number being preferably a multiple of two and three. By this means, by simply changing the connections of the coils, the motor may be adapted to any probable demands.

If the number of poles in the motor is even, the action will be harmonious and the proper result will be obtained ; if this is not the case, the best plan to be followed is to make a motor with a double number of poles and connect the same in the manner before indicated, so that half the number of poles result. Suppose, for instance, that the generator has twelve poles, and it would be desired to obtain a speed equal to 12-7 of the speed of the generator. This would require a motor with seven pole projections or magnets, and such a motor could not be properly connected in the circuits unless fourteen armature coils would be provided, which would necessitate the employment of sliding contacts. To avoid this the motor should be provided with fourteen magnets and seven connected in each circuit, the magnets in each circuit alternating among themselves. The armature should have fourteen closed coils. The action of the motor will not be quite as perfect as in the case of an even number of poles, but the drawback will not be of a serious nature.

However, the disadvantages resulting from this unsymmetrical form will be reduced in the same proportion as the number of the poles is augmented.

If the generator has, say, n, and the motor n_1 poles, the speed of the motor will be equal to that of the generator multiplied by $\frac{n}{n^1}$.

The speed of the motor will generally be dependent on the number of the poles, but there may be exceptions to this rule. The speed may be modified by the phase of the currents in the circuits or by the character of the current impulses or by intervals between each or between groups of impulses. Some of the possible cases are indicated in the diagrams, figures 18, 19, 20 and 21, which are self-explanatory. Figure 18 represents the condition generally existing, and which secures the best result. In such a case, if the typical form of motor illustrated in figure 9 is employed, one complete wave in each circuit will produce one revolution of the motor. In figure 19 the same result will be effected by one wave in each circuit, the impulses being successive ; in figure 20 by four, and in figure 21 by eight waves.

By such means any desired speed may be attained ; that is, at least within the limit of practical demands. This system possesses this advantage besides others, resulting from simplicity. At full loads the motors show an efficiency fully equal to that of the continuous current motors. The transformers present an additional advantage in their capability of operating motors. They are capable of similar modifications in construction, and will facilitate the introduction of motors and their adaptation to practical demands. Their efficiency should be higher than that of the present transformers, and I base my assertion on the following :—

In a transformer, as constructed at present, we produce the currents in the secondary circuit by varying the strength of the primary or exciting currents. If we admit proportionality with respect to the iron core the inductive effect exerted upon the secondary coil will be proportional to the numerical sum of the variations in the strength of the exciting current per unit of time ; whence it follows that for a given variation any prolongation of the primary current will result in a proportional loss. In order to obtain rapid variations in the strength of the current, essential to efficient induction, a great number of undulations are employed. From this practice various disadvantages result. These are, increased cost and diminished efficiency of the generator, more waste of energy in heating the cores, and also diminished output of the transformer, since the core is not properly utilized, the reversals being too rapid. The inductive effect is also very small in certain phases, as will be apparent from a graphic representation, and there may be periods of inaction, if there are intervals between the succeeding current impulses or waves. In producing a shifting of the poles in the transformer, and thereby inducing currents, the induction is of the ideal character, being always maintained at its maximum action. It is also reasonable to assume that by a shifting of the poles less energy will be wasted than by reversals.

Mr. George Kennan, the well-known Washington, D. C., journalist and an old-time telegrapher, has an excellent article on Siberia in *Century* for May.

*A NEW SYSTEM OF CABLE TRANSMISSION.

Judging from results obtained by a preliminary test, recently made, cable telegraphy, which has from the beginning claimed the best endavors of electricians and inventors, is about to be improved to a very important extent and in direction long sought for. Mr. Patrick B. Delany, who has been giving the subject attention for the past year, has just perfeected an invention by which long cables may be operated by any Morse operator, and by which the received characters are not only greatly improved but the rapidity with which they may be transmitted greatly increased.

It is generally known among telegraphers that the cable operator uses two keys in transmitting—one connected to the positive and the other to the negative pole of a battery—and that dashes are always sent from one key and dots from the other. In actual practice, dots alone are used, but a dot on one key always stands for a dash at the receiving end of the cable, since it swings the siphon-recording pen always to the same side of the middle of the strip of paper ; while a dot from the other key always swings the siphon to the opposite side. The object of using dots only is to avoid unequal charging of the cable and consequently unequal discharge of the static from the cable. Thus when a letter, "b" for instance, — - - - , is sent into the cable, the first dot, representing the dash, is sent from one key and pole of the battery and is recorded on one side of the centre of the paper strip. The three dots necessary to complete the letter are sent from the other key and reverse pole of the battery, and the delicate recorder is carried to the other side of the strip. These last three dots being from *the same pole of the battery* are recorded as a slightly undulating line with three little hills and valleys, something like the letter "m" in manuscript. The distinctness of these undulations depends upon the rapidity with which the dots follow each other into the cable. If sent in very rapid succession they would appear as a straight line and be illegible even to the practiced eye of the cable operator. If a short time is allowed to elapse between them their outline will be clearly defined. It is this tendency of impulses of the same polarity following each other in quick succession to become a continuous current in the cable and make a straight line on the paper that limits the working speed of the cable.

It will he plain, therefore, that if Morse characters could be transmitted with regularly alternating currents of uniform duration the record at the receiving end would be very much clearer, and probably double the uumber of signals could be sent in a given time. The swing of the recording pen would be greater the angles sharper, the limit of oscillation of the recording pen uniform, and the tendency of the record to become a straight line avoided. These desirable improvement have been accomplished by Mr. Delany, and an examination of the principle of operation will show that it not only greatly simplifies cable transmission but brings it to a state of perfection which must largely enhance the the working capacity.

The line is connected to a trailing finger which moves from one segment to another at each reversal of the local current which controls the escape armature of the polar transmitter all being under control of a single Morse key. There are three groups or sets of segments in the circle, the battery connected segments being joined to opposite poles of the main battery. The intervening segments are all projections from a single plate which is connected through a condenser to earth. In this position the key is up or "open," the armature of the polar relay is on the open side, and the trailing finger rests on a segment, which, if the key be pressed down, is put in connection with the positive pole of the main battery. As the key is open there is no current going to line. Now if the key be pressed down the connection to the positive pole of the main battery is first made but only for a moment, however ; for, as soon as the key lever reaches its limiting stop the local battery through the polar transmitter is reversed and the trailing finger is moved to the next battery segment, which finds its battery connection through the spring contact at the back end of the key. So long as the key is held down the negative battery cannot go to line ; therefore if the key be held down for the time represented by a dash the armature of the polarized relay at the receiving station, which went to its right hand or "marking" limit when the key was *first* pressed down, will remain there and keep the sounder circuit closed ; and thus there is a continuous dash, although the line was disconnected from the battery as soon as the key was pressed down to its limit. Or, differently stated, when the key is pressed down a current of one polarity is sent. If it is immediately lifted up a current of opposite polarity is sent, lasting for the short time between the downward and upward movement, forming a dot. If the key be held down a dash is formed, not by the passage of a long impulse, but because the opposite polarity which terminates each signal is deferred until the key is lifted up. One current is the beginning of all signals, the other is the ending ; the time between the beginning and the end terminates whether the signal is a dot or a dash.

It will be readily understood that there are no dashes sent into the line, that all currents are of equal duration and alternating in polarity. The trailer transfers the line from one battery segment to the other *in advance* of the movement of the key. In passing from a battery segment to the condenser segment the trailer connects the two together for an instant, thereby charging the condenser with the same polarity of current sent to the line. While the trailer is passing over the condenser segment *alone*, the condenser discharges into the line its induced current of opposite polarity, which meets and neutralizes the static discharge coming out of the line or cable, and thereby leaves the cable perfectly clear for the next signal impulse. The capacity of the condenser is readily adjustable to the discharge from the cable. The duration of contact between the battery and line may be regulated by adjusting the key. If the lever is given wider play between its stops the yielding contacts will put the main battery to line for a longer time.

About a year ago, with an instrument having the trailer propelled directly by the key lever, Mr. Delany made an experiment in England which developed thirty words per minute over an underground cable, having 7,000 ohms resistance and 90 microfarads capacity. It was found that for longer cables a longer duration of contact between the battery and line than could be obtained from direct key working would be necessary. In that instrument the battery was connected directly and permanently to the segments and was put to the line only while the trailer was moving across a segment. In the present instrument the duration of the impulse may be made sufficient for the longest cable and the efficiency of the apparatus may be judged by its performance during a rough experiment over a cable within the past month. The cable is 1,000 miles long, with a resistance of 18,000 ohms and a capacity of 900 microfarads.

It is worked with 30 cells of Fuller battery, which, with pole changing keys, is reversed. No additional battery being available at the time, Mr. Delany's instrument was tried with 15 cells (half the usual quantity) for each reversal without much expectation of satisfactory results from so weak a current. The record proved a great surprise, and shows beyond question that the speed of working over long cables can be greatly increased with diminished battery power.

* In *Electrical World*, June 9 with illustrations of ocean telegraphs.

Mr. F. W. Cushing, of the Chicago Arc Light and Power Co., is now on the Pacific Coast.

PORTLAND, OREGON, NOTES.—The personnel of the Western Union here is as follows: J. W. Hayes, manager, who by the way is one of the finest men that ever entered the profession, and is well liked by every one who know him. Geo. H. Thomas, chief, with his brother Percy who acts as noon chief; T. F. Rourke, who has been here for several years, now works Astoria and ways; A. Last, from Winnipeg, who but a year ago came over from England, where he used the Continental, now works the ways; T. J. Gallagher, a new arrival, works San Francisco; J. G. Leter and C. G. House are on day report and ways; T. Thomas and T. J. Small handle Seattle and Tacoma wire, which is one of the heaviest in the office, there being much competition at Seattle, Tacoma and Portland between the Postal and Western Union for the northern business. B F. Cummings also works one of the day tricks on Helena. A. W. Perry, formerly of Spokane Falls, W. T., is now with us. Mr. Perry is considered quite rich in this world's goods, having about $15,000 sunk in real estate in the northwest. W. H. Gillespie, formerly dispatcher for the O. R. & N. at Umatilla, now works days here. The night force is represented by F. M. Overbeck, a right genial fellow, as chief, Messrs. Cook and Jayo McConniff on report. S. Davis, formerly of Tacoma, works San Francisco, and Fred Loomis works the late signal trick. Mrs. Clara Manela, formerly of Vancouver, branch office. Chas. F. Drake, an old-timer, is our bookkeeper, with Messrs. Jones and Eller as receivers. Messrs. J H. McFarland, J. A. Crouch and Frank Bruce are our able linemen, who, with C H. Stokes, at the Dalles, Ore., J. H. Nye, Oakland, E. Salisbury, Tacoma, W. T., C. H. Whittle, Kamela, Ore., J. F. Kreps, Walla Walla, W. T., and F. G. Hibner, Ashland, complete the list of linemen for this district. At The Dalles we have Mrs. Fannie Chapman and at Pendleton Miss J. J. Wirt, formerly of Chicago, and at Walla Walla Mr. E. F. Waring. E. A. Brown, who left us a short time ago, has located in St. Paul, where he is engaged in the immigration business for this State. D. W. Kearney leaves us this week. At the Postal we have Messrs. J. Stronach, manager; H. S. Martin, chief operator; W. A. McGovern, night chief; E. E. Mallory, days and Ike McDonald, formerly of the W. U., nights. At the office of the Oregon and California Ry., are Messrs. L. R. Fields, chief dispatcher; J. D. Bodley, assistant dispatcher, with O. W. Taylor and G. C. Morris day and night operators. Just a few miles from town, up the beautiful Williamette river on the narrow Gauge Ry., can be found at Dundee, Messrs. F. D. McCain, dispatcher; J. McGuire, superintendent and R. D. Sullivan, operator. At Umatilla on the O. R. and N. Ry., are to be found five of the finest men in the business; Messrs, E. Lyons, train master; F. S. Rawlins, chief dispatcher, with T. T. Windsor, W. H. Hyde and W. A. Whitney, who work first, second and third tricks respectively.

TORONTO NOTES.—Mr. B. B. Toye, manager of the operating department of the G. N. W., has recently been bereaved by the death of his brother, Frederick N. Toye, the latter's wife and three children, by a fire in their residence at Uffington, Ontario. It is believed that the father and mother were suffocated with the three children while endeavoring to rescue the latter from the flames. Two matches of base-ball between the G. N. W. and C. P. R. resulted as follows: G. N. W. Co.. 25 runs; battery, Davis and Mc. Carthy. C. P. R. Co., 8 runs; battery, Mc. Dougall and Hill. Umpire. Fitzsimmons. C. P. R. Co., 22 runs; battery, Barber and Hill. G. N. W. Co,, 7 runs; battery, Walker and Cullen. Umpire, Burrows. Lou Jones of Brockville is here visiting friends. Geo. Thorne has changed his position from the G. N. W. to the C. P. R. Miss Mitchell of the G. N. W. goes to Buffalo for a month. Mr. Alex. Bennett has resumed his position as night press man in the G. N. W.

BROOKLYN NOTES.—Mr. J. J. Gorman, the popular agent at the Bridge station, has been promoted to a train dispatchership on the Elevated road at City Hall station. His many friends wish him success. James Pembroke has been transferred from Navy street to Bridge street, mornings; H. J. Moffett, Greene avenue to Navy street; R. H. Gibson of Gates avenue, and W. J. Paris of Manhattan Junction, have been promoted to telegraph operators in dispatcher's office. Among new arrivals are H. Wagner from Penn. R. R., now at Sumner avenue, nights; T. F. McGannon from Standard Oil Company, at DeKalb avenue; C. D. Knight from New York Central R. R,, at Manhattan Junction; A. Knight from Long Island R. R. at Washington avenue, and T. Ackerman from West Shore R. R., at Navy street and Myrtle avenue.

SARATOGA NOTES.—The season at this point will not open until about the 21st inst., when business will be handled with a rush. The Western Union is in good shape and many broker offices will be opened within a few days, that no hitch may occur when the usual crowd arrives. We find an active competitor for telegraph business at this place in the shape of the American Telephone and Telegraph Company, which has established an excellent office at 5 Division street. Mr. E. W. Venable of New York is in charge. Mr. Venable says that he proposes to earn considerable revenue for his company, notwithstanding the fact that the telegraph companies are endeavoring to capture everything telegraphic which should yield a profit.

SIOUX CITY, IA , NOTES.—C. S. Soule, formerly manager of the Western Union office has resigned and is succeeded by Mr. J. E. Dayhoff, an old timer from Chicago, who is a thorough and enterprising business man. Mr. J. F. Slack has been made day chief and wire chief. He is supported by the following well-known operators: L. Monnet, M. O. Heron, F. M. Riddick, C. P. Ash, N. Briere, Joe O'Donnell, Miss Quillinan, W. R. Luckfield and J. Bailey, extra; nights. H. H. Palmer, chief; C. O. Cox and Owen Pritchard; Miss Maggie Walker takes care of the receiving counter. The Postal is not enjoying the walk over on business it had a short time ago. The tables have been turned.

KANSAS CITY NOTES.—H. L. Shannon has left the W. U. delivery department to take a position with Kingan & Co., as operator. Mr. M. Evers from Sedalia has been visiting here. The Western Union and the Pacific Mutual forces have organized base ball clubs, and last Sunday they repaired to the ball ground to have a match game, Mr. Corum having a permit for the grounds, but on arriving there they found them already oocupied by other clubs. The game was postponed, thereby saving doctors' bills and broken fingers. There have been no appointments or resignations since our last letter, among the forces in the various offices.

THE TRAIN DISPATCHERS.—The American Train Dispatchers' Association met in annual meeting at Louisville, Ky., June 12th. It is expected to result in the disposition of many important resolutions relative to the uniformity of train orders, which the association has had under consideration for two years. It will be remembered that last year's meeting, which was to have been held at Boston, was a failure, owing to a strict enforcement of the Inter-state Commerce Bill. The present meeting is a success numerically and financially.

Mr. Harry Quigg, an old-time and popular dispatcher on the Long Island Railroad has been made train master, and his friends are accordingly very happy.

NOTES FROM 195.—Thanks to the good judgment displayed by Chief Operator Boone, of St. Louis, and his worthy assistants, the report of the thirty-eighth annual session of the Democratic National Convention came to us in such a highly creditable condition that all the boys on the floor were pleased. General Traffic Chief Cummings looked after the newspaper interests here and assigned to Paul Sheehan, wire chief of the 1 to 8 A. M., who was ordered to report in the evening as well, the responsibility of looking after the loops. That the work was well done was shown by the commendatory letters the management received from the press. The large number of night men ordered on during the day vied with those who do their work by sunlight in the performance of excellent service. The waiting list man was in his element. He was everywhere. And one of them, on St. Louis, converted into horticulturists all the delegates in convention by the description, "And all rose *en masse* and waved their red bananas." It was fruit for the boys then, and is now. Those who are prone to superstition will look with awe upon the following : "Allen G. Thurman. Born Nov. 13, 1813. The red bandana." It will be observed each sentence contains thirteen letters or figures. Now add the date of his nomination, June 7, to that of the election, Nov. 6, and you have as a product another thirteen. And still another is to be found in the name of our esteemed friend Thomas Kennedy eastern wire chief, in whose fertile brain the foregoing had its origin. Changes : C. S. Foster 11.30, *vice* C. G. Millard 8 to 5 30; G. W. Sawyer 11.30, *vice* D. P. Smith 7 to 4.30; T. M. Henderson 11.30, *vice* J. McDonald ; Mr. Pender 11.30, *vice* J. J. Murray 8 to 5.30 ; J. F. W. Ulrich 11:30 to 9, *vice* M. J Dixon 6 to 3. Additions to waiting list: Houlder Hutgins, late of Philadelphia ; A. Bartholowmew, a recent arrival from Jacksonville, Florida ; G. A. Bloeder, S. M. Fones, Richard Powers, Charles McCutcheon, Messrs. Bergen and McBride. Messrs. Stewart, Bradley, Nolan, Richards, Melvin, Hann, Boyle, McCrum and Sammons of the night force are soon to cross bats with the day men. Leslie Miller has been added to the regular night force. While surveying the huge map near the water font the other evening he was heard to remark that in his travels he had visited every section of the country except Oregon. Old bachelors read with great glee this message which passed through the office a few days ago : "Matrimony is a pond of fishes in which another sucker has been caught. Congratulations." A son has been born to Manager Dealy and a daughter to Chief Operator Reemer of the Wheatstone department. Quite a number of young ladies it is intimated will go to the country shortly to take charge of summer offices. We shall miss each and every one of them notwithstanding the fact there are nearly 300 employed here. Master Hefferen, a check boy on the 1 to 8 A. M. force, enjoys the distinction of being not only the youngest but one of the best drummers in the Eighth Regiment band. Charles Gray, the well known operator at the *Sun* Bureau, was married on the 11th inst. to Jennie Kennedy, late of the city department. Congratulations. The early morning report sent to Cincinnati, St. Louis and the West is edited by Mr. Ed. Delaney, known to the profession throughout the universe as the "Brevity Man." He deserves all he has got and more.

The leading topic of conversation among theatrical and telegraphic circles at present is the placing on the boards on June 25th, at the Windsor Theatre, of a new play entitled "Dollars and Hearts," the author of which is one of the best known telegraphers in the country, and also an actor of considerable ability. Harry A. DuSouchet is well-known as a telegrapher all over the United States, and in this, his initial step as a play-writer, he will have a host of well-wishers. He will be given an ovation on opening night, and he deserves it not only for his many social qualities, but for the decided merit of his play, which good critics say is not surpassed in its line. To show a substantial appreciation of the esteem in which the author is held in New York, preparations are on foot for a monster Theatrical Party to take place Monday night and Wednesday matinee, June 25th and 27th respectively, at which there promises to be such a gathering of ladies and "knights" of the key as New York never witnessed before. Tickets have already been spoken for in such numbers that those who desire good seats have to apply early in order to get them. The best, however, will be reserved for the fraternity, and they should not fail to take advantage of the "first night." The play is a bright, laughable one, and in many particulars strong, giving scope for a wholesome display of talent, which will be taken advantage of by those who comprise the caste. The company is an unusually good one, comprising such well-known artists as Geo. Woodward, who, as Elder Shadrach in the "Widow Bedott," will long be remembered for his excellent characterization of the part; Miss Lillian Brown of the Boston Museum Theatre Company, Walter Perkins, whose very clever work with Maggie Mitchell, Lillian Brown's Electric Doll Co," and "Held by the Enemy," has made him a well-known favorite with metropolitan audiences ; Miss Lillie Ramsden, the delightful little soubrette, Miss Elizabeth Andrews, Mr. Edward Warren and others, are a guarantee of a more than ordinary treat for those who attend. A very enjoyable affair can be expected on opening night and a most hearty endorsement should be given to our fellow worker.

An electric belle—a female telegraph operator.

Professor Gray's Telautograph.—The telautograph, which it is said, will revolutionize both the telephone and the telegraph, is in its general appearance a stand or table with duplicate parts. On one of these parts are the appliances for transmitting and the other for receiving. Each is a disc covered with a specially prepared paper. The operator writes on the paper as on an ordinary sheet, and the message is reproduced on the connected instrument. If the adjustment is perfect the chirography will be reproduced in a perfect fac-simile, just as a telephone transmits the voice. The power of the instrument is equal to that of the telegraph, and a longer range of connection is possible than with the telephone. An advantage of the instrument will be that it will facilitate commercial business, and letters which are now handled by mail can be sent over the wire with the convenience of telephone transmission.

Boulanger and Mackay.—The *National* having recently thrice alluded to alleged relations between Gen. Boulanger and a rich American residing near the Arc de Triomphe, Mr. Mackay has written a formal letter denying that he has ever been acquainted with General Boulanger. He did not, however, deny the fact that he was intimately acquainted with Count Dillon, who is a bosom friend of General Boulanger. It is thought that the medal of the Legion of Honor with which Mr. Mackay was decorated in France is one of the M. Wilson issue.

The impression prevails in some sections of the country that operator Harry Hartney, some months since caused a railroad accident in Wisconsin through carelessness. This impression is entirely erroneous and does an injustice to Mr. Hartney

Manager Geo. Hayford, of the W. U., Santa Ana, Cala. is evidently an enterprising official judging from a circular he has issued, announcing the removal of his office and soliciting business. The circular ends with the words : "Don't forget to telegraph."

H. Maedel, of Carleton Place, and H. B. O'Conners, of Arnprion, Ont., are now with the C. P. Ry., Calumet, Quebec.

ELECTRICAL ENGINEERS.—The total number of members and associates is 322, of whom 267 have paid up in full to date, seven are in arrears for the present year, twelve for two years, and thirty-six for three years.

The secretary, Mr. R. W. Pope, acknowledges the receipt of the following gifts from friends of the Institute:

From Mr. Edward P. Thompson a carpet for the office of the Institute.

From Mr. T. C. Martin $25 cash toward furnishing the same.

From Mr. Charles Colne a set of Patent Office Reports.

From the Consolidated Telegraph and Electrical Subway Company, a bound volume of photographic views of the subways as constructed in New York City.

From Mr. Emile Berliner a working model of his "Molecularium."

From Mr. Wm. H. Sawyer, files of the London *Electrician*, London *Electrical Review* and New York *Electrician* and *Electrical Engineer*.

The telegraph scene in "Across the Continent" is a source of ridicule to telegraphers. The star of the play is, in one scene, telegraph operator at a small station on the Union Pacific Railroad, and is surrounded with hostile Indians. He telegraphs for help in an unintelligible jargon of dots and dashes, translated by him for the benefit of the audience. As a general thing the operator behind the scenes does not know any more about telegraphy than the one on the stage, but his jumble is read to the breathless audience, as intelligence that help is coming. Occasionally a practical telegrapher is employed behind the scenes, and he seldom fails to take advantage of the situation. On one occasion the sounder ticked off: "Say, Oliver, let's take a drink." Which was received by "Oliver" with: "Thank God! we are saved!"

POSTAL EXTENSIONS.—The Postal Telegraph Company is pushing forward a line of new wires from Boston to Portland, Me., touching all intermediate points. Superintendent Pettingill, of Boston, will have charge. Much satisfaction is expressed by the citizens of the locality through which the wires pass at the outlook for this prosperous opposition. The company is known as the Commerical Union Telegraph Company. Two new copper wires have also been erected between New York and Chicago, to accommodate the rapidly growing business. A wire is being erected between Cleveland, Ohio, and Erie, Pa., which is a good point to reach. Trenton, N. J., will also be looped into Philadelphia in a very few days.

WESTERN UNION BONDS.—The new Western Union 5 per cent. bonds are being signed, and are expected to be ready for exchange for Mutual Union Stock and bonds on July 1. In the exchange $5,000,000 bonds will be given for the Mutual Union bonds, and $2,500,000 bonds for Mutual Union Stock.

CANADIAN BUCKET SHOPS.—The new law suppressing bucket shops in Canada will, says a dispatch from Montreal, inflict a loss of at least $130,000 per annum upon the telegraph companies. The yearly contracts between the bucket shops and the companies for special wires will be cancelled.

THE MILITARY TELEGRAPHERS' BILL.—A correspondent desires to know the status of the Military Telegraphers' bill now pending before congress. The bill which Senator Manderson characterizes as more ornamentel than useful was reported favorably to the Senate, where it still remains unacted upon.

ELECTRICAL PATENTS GRANTED MAY 22, 1888.

383,105 Electrophorous; James D. Culp, San Felipe, Cal.
383,150 Secondary battery; Samuel Russell, Brooklyn, N. Y., assignor to the Central Electrical Company of New York.
383,178 Machine for splicing wire; William Haag, Lansing, Mich.
383,184 Electrical apparatus for purifying water; Albert R. Leeds, Hoboken, N. J.
383,198 Secondary battery; John S. Sellon, Sydenham, County of Kent, England, assignor to the Electrical Accumulator Company of New York.
383,271 Battery zinc; John Beattie, Jr., Fall River, Mass., assignor to the Beattie Battery Zinc and Electrical Company, same place.
383,273 Electrical tramway. 383,274 Electrical tramway; Henry T. Blake, New Haven, and Clarence Sterling, Bridgeport, Ct.
383,320 Dynamo electric machine; Lawrence N. P. Poland, Cincinnati, Ohio.
383,345 Rheostat; Frank J. Crouch, Eugene City, Oregon.
383,385 Testing machine; Arthur V. Abbott, Brooklyn, N. Y., assignor, to E. & T. Fairbanks & Company, St. Johnsbury, Vt.
383,411 Electric lamp; Eli C. Ohmart, New York, N. Y., assignor, by mesne assignments, to the Ohmart-Homans Electric Lighting Company of New York.

Granted May 29, 1888.

383,450 Printing telegraph; Samuel V. Essick, Brooklyn, N. Y.
383,485 Electric punch register; Augustus C. Palmer, Utica, N. Y.
383,548 Electric battery; Edward A. Widt, Long Island City, N. Y.
383,560 Secondary battery. 383,561. Propelling vehicles by electricity. 383,562. Secondary battery; Camille A. Faure, New York, N. Y., assignor to the Electrical Accumulator Company of New York.
383,583 Electro magnetic register; James F. McLaughlin, Philadelphia, Pa.
383,640 Storage battery plate; Charles D. B. Gibson, New York, N. Y.
383,734 Insulator for electrical wires; Frank E. Keyes, Peterborough, N. H.
383,843 Relay; John E. Watson, Louisville, Ky., assignor to the International Electric Company, same place.

RAILWAY TELEGRAPH SUPERINTENDENTS.—The Seventh annual meeting of the Association of Railway Telegraph Superintendents will take place at the Murray Hill Hotel, New York, July 11th.

Exhibitors of electrical appliances are invited to confer with any of the following named gentlemen of the committees: Committee on Electrical Devices, Chas. Selden, Esq., Chairman, Baltimore, Md. Committee on Space, Messrs. W. J. Holmes, S. S. Bogart and C. E. Topping, New York.

It is thought that this meeting will be more largely attended than any of its predecessors. Much interest is manifested on the subject of electrical appliances, and it is to be hoped that the various manufacturers of electrical goods will respond to the invitation extended. Electricity is playing an important part in the conduct of railway trains, and the superintendents of telegraph propose to exchange views and investigate electrical appliances with the object in view of perfecting the system now in use.

It is expected that the new switchboard of the Metropolitan Telephone and Telegraph company of New York will be ready to receive the wires about September 1st. It will cost about $350,000 and will accommodate 10,000 subscribers. The length of the switchboard is about 300 feet, which will make it the largest in the world.

The sale of the Fort Worth and Denver Telegraph Company to the Western Union was announced June 2d. The line extends from Fort Worth, Tex., to Denver, and is the only telegraph line running northwest. The terms were private.

At a recent meeting of the Liverpool Chemists' Association Dr. Symes exhibited and described Mr. Tudsbury's new double cylinder electric machine for the generation of frictional electricity.

TELEPHONE NOTES.

The New England Telephone and Telegraph Co., have for the past month been laying underground conduits on Cambridge street, Boston.

The numbers of all subscribers of exchanges in the Suburban division of the New England Telephone and Telegraph Co. will be changed on the issue of the July list.

A good many telephone instruments in residences at Cambridge are being taken out to be replaced in the fall, on account of persons moving away for the summer.

The Bowdoin building at 33 Milk street, Boston, was set on fire June 7th by electric light wires coming in contact with the wires of the Baltimore and Ohio Telegraph Co., who occupy the lower floor of the building. The blaze appeared at one time to threaten a big fire, but the asbestos roofing saved the building. The B. & O. are not heavy losers.

PERSONALS.—Mr. Geo. E. Hanson, superintendent of the New England Telephone and Telegraph Co., Surburban division, makes his headquarters at Somerville, Mass. E. T. Timothy, formerly inspector for the Cambridge Exchange, has been transferred to Medford, Malden, and Woburn, suburbs of Boston. Mr. T. Cambell, an old operator, now in the employ of the Telephone Co. at the Suburban division as trunk line trouble man, contemplates entering a new business enterprise in the near future, in which we all wish him success.

The Brattleboro, Vt., telephone exchange has lately been fitted up with a long distance telephone machine.

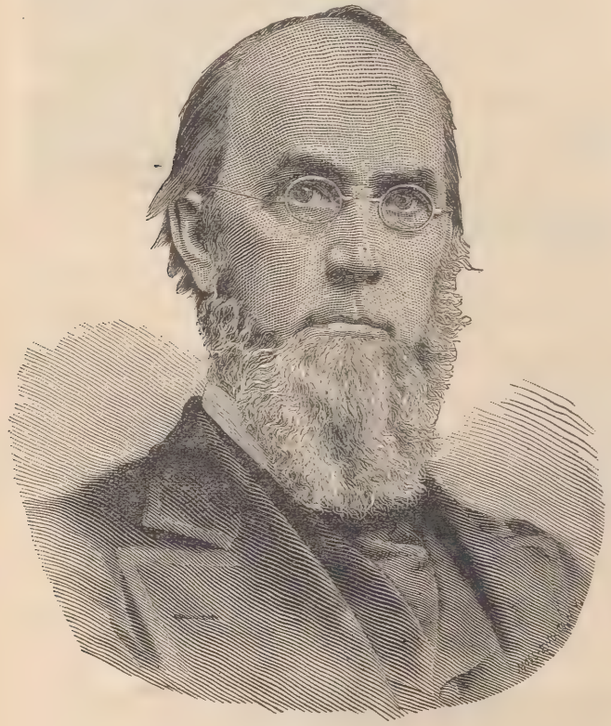
The Metropolitan Telegraph Co. of Brattleboro, Vt., is a private company, owning a wire that is connected among the business people of the city. A. W. Childs is secretary and treasurer and H. B. Chamberlain president.

LONG DISTANCE TELEPHONE RATES.—The tariff for five minutes' conversation over the long distance telephone between New York and Boston is $2. It is $3 between Philadelphia and Boston. Customers are privileged to call for the individual with whom it is wished to communicate. If he cannot be found, and no message is sent, no charge will be made.

RAILROAD EXPERIENCE.—A Pennsylvania railroad manager writes us that his office is taken for every other office about the station. When we are right busy, "bang, bang," on window. We open wire, stop about fifty other men, and say, "Well." "Please give me a ticket to New York, and how long is it good for? Can I stop off?" Or, "Can I speak to you for three or four hours?" About that time we are weary, and the man on the other end of the wire is getting mad, thinking that we are talking to our best girl or something like that. Then in comes the man or woman, who says, "I want to send a message to New York quick; tell them I'm coming on 2 o'clock train; how much for it?" Then we go to work systematically to find out who it is that is to know this important news. "Who is it to?" "Why, to my sister; she lives in New York." "Exactly—has she any name?" "Of course—Mary Smith; everybody there knows her." And so on by persistent and close questioning we at last get the correct address. Then comes another tug to get signatures. Again we have the customer who cannot write—we must write for him or her—another's message is all up side down, so we must rewrite it to get at the sense of it. If we happen to be busy receiving or sending messages when these people strike the office, it's all the same, we must stop or they make such an infernal racket that we can't do or hear anything. When we open a wire we of a necessity stop ourselves, the man working with us, and probably twenty-five other men who want the same circuit. When we tell our man "go ahead," he says, "you're a plug; get an operator; some one who wont have to hold the wire open a week." All this is pleasant, considering why you hold the wire open. These are a few specimens. Any operator will stand up and bear me witness that they are as described, only are given here in their mildest form.

THE LATE GEORGE M. PHELPS.

We are indebted to the *Electrical Engineer* for this very excellent cut of the late George M. Phelps, whose obituary appeared in our last issue. Mr. Phelps was one of the best known electricians in the country, having been closely identified with the telegraph from the time of its inception.



DOING UP THE ST. LOUIS CONVENTION.

I have referred to these gentlemen by name because they are the ones through whose eyes the millions of readers throughout the United States are looking at St. Louis and learning all that is going on in the convention. They are a highly gifted set of gentlemen. They know the public men of the country and have intimate personal relations with many of them. The special correspondents of the great dailies as well as of other enterprising newspapers devote themselves more especially to the picturesque features of the occasion. The reports of the proceedings and of all the important incidental operations of the delegates are made by the press associations. They give a complete account of the real work of the convention. The United Press is making a splendid record for itself in the way it is handling the business. General Manager Phillips watches every detail with earnest solicitude, and manages his corps of men with the skill of an experienced general. As a result of his careful management, bulletins of every interesting point in the proceedings are on the desks of the editors of his hundreds of newspapers within sixty seconds after each event occurs. Then follow detailed reports of the whole business. This is one of the wonders of modern journalism that comparatively few, I fancy, of the many millions of newspaper readers realize. It is done by having the editorial offices of the newspapers connected by telegraph wires with The United Press office in New York. Day and night from one year's end to another the click of the instruments is heard at headquarters. The best telegraph operators in the country receiving and sending, handle this ceaseless tide of intelligence. It is in this way that The United Press has grown to be, within the four years that have elapsed since the last National Conventions, the great national institution which it is to-day. The victory which it won four years ago over its competitors, both in its reports of the Conventions and its announcement of the result of the election, is recalled to many journalists here by the presence of its general manager and his corps of assistants. As a representative man of his profession, he is the great man of the hour from an independent journalist's point of view. About forty years of age, rather under the medium height, with a heavy frame and portly presence, a large head in which the perceptive and energetic faculties are well developed, a powerful neck squarely set on his massive shoulders; with strongly marked and pleasing features, an eye that one moment flashes fire and then twinkles with humor or beams with benificence, the general manager of The United Press is the journalistic hero of the Convention. In the happy phraseology of Daniel Dougherty, I repeat "a name entwined with victory"—Walter P. Phillips of New York. St. Louis correspondence of the New York *Journalist.*

Our young and talented friends, who are anxious to explore foreign countries will see by consulting the advertisement on another page, an opportunity calling for the services of a competent telegraph and telephone man under a two years' contract. Under the advantages of this kind to cast one's lot, with a responsible and enterprising concern, salary and novelty should be among the smallest considerations.

The directors of the Western Union Telegraph Company, on June 13, declared a quarterly dividend of 1 1-4 per cent., payable July 15. A statement submitted to the meeting estimated the net revenues for the quarter ending June 30, at $1,350,000 an increase of $300,000 over the corresponding quarter last year. The surplus was given as $7,456,887, an increase of $846,455.

Probably the hottest contested telegraph district anywhere to be found, is the Sugar district of New York. J. Simmonds represents the Mutual Union and the Western Union and J. McClary, the Postal Company. The Postal seems to be the general favorite because of its excellent system of direct wires, quick service, fine staff of operators and obliging manner in conducting the business. Mr. McClary is one of Postal Company's star manager's and has built up a magnificent business for that company. It is only a question of time when the M. U. office will have to be closed up entirely for want of business.

MARRIED.—On June 6, in Brooklyn, N. Y., Mr. H. I. Jolley to Miss Nellie E. Flood. The happy couple were the recipients of very many beautiful and useful presents. Mr. and Mrs. Jolley are well known members of the telegraphic profession and their numerous friends extend them hearty congratulations with wishes for a long, happy and prosperous life. Mrs. Jolley is a sister of Manager Flood of the Postal main office of this city.

DEATH OF THOMAS M. MILER.—Thomas M. Miler, an old-time printing operator for many years, died at Mansfield, Mass., June 12th, 1888, of spinal meningitis. Mr. Miler entered the telegraph service as operator upon the House printing system in 1850, at Boston. He enlisted in the First Mass. Volunteers at the breaking out of the war and served as color bearer of his Regiment; was captured and confined for eighteen months in Libby Prison and Belle Isle. After returning north he re-entered the service at New York, as printing operator upon the Boston circuit. His health became broken down during his imprisonment and for the past three or four years he has been an invalid, bearing his suffering, however, with a fortitude that was the admiration of all who knew him. His genial, hopeful disposition gained him many friends in this city. Mr. Miler was a member of the T M. B. A., the Aid Society, the Grand Army, Knight Templars and many other organizations. He leaves a daughter.

ELECTRICAL PHENOMENA.

Dr. Rogers Attributes Many Strange Things to the Forces of Electricity.

A paper of unusual interest to the members of the Buffalo Electrical Society was read June 4th, by Dr. Henry R. Rogers of Dunkirk, the author of "a New Philosophy of the Sun."

The subject treated of was "The Great Cosmical Problem, or Electricity on the Scale of the Universe," which was handled in an exhaustive and able manner. The lecturer set out to show that all the physical phenomena with which we are acquainted could be more satisfactorily explained on the theory that they were identified with electricity than upon any other philosophy yet formulated. Philosophy had taught that a certain vital essence pervades and animates all created things, which principle operated throughout the infinity of space ; and the question of the hour was to know what this universal essence was. From the fact that electricity was the only force known which reached out and embraced in its power all celestial bodies, the lecturer contended that electricity was the answer to that question.

That there was an electrical relationship between the Sun and earth, was clearly established by the fact that simultaneously with the appearance of the sun-spots, violent electrical disturbances are observed at the earth's surface. Furthermore, Dr. Scoresby converged the sun's rays to a focus by means of a lens made of ice and set fire to combustibles, exploded gunpowder, etc. That these rays were electrical could be shown by the production of similar effects from the convergence of parallel rays of an electric light. These and other facts must be accepted as actual demonstrations that there are incessant interactions of an electrical character and subject to electrical laws between the sun and earth and inferentially between all celestial bodies. Space was virtually annihilated between these bodies by reason of the fact that vacuum is the most perfect condition for the transmission of electricity.

How then was this electricity set in motion and transmitted into the forms of energy known as gravity, sunlight, sun-heat, etc ? We could best gain a knowledge of the unknown by comparison with things near and known to us. It was a fundamental principle of electrical science that the movement of bodies opposite to magnets induces circulating currents, and since there was no question of the earth's being a huge magnet, it was reasonable to suppose that the sun and earth rotating in their axes and in their orbits gravitation, just as a body of soft iron becomes attractive under the energizing influence of an electric current. The elliptical form of the earth's orbit might be readily understood from the principle involved in the law of magnetic attraction and repulsion.

There was a constant alternation of the polarity of the earth in its relation to the sun caused by its revolution in its orbit, and the mutual attraction necessarily increases and diminishes with mathematical precision and regularity with the consequent result of an elliptical pathway for the earth.

After dealing with the phenomena of heat and cold, which the lecturer argued should be accorded equal rank with light, gravity, etc., in the category of the great physical force, he went on to say that a change was very rapidly taking place in our methods of dealing with these vital questions.

New and improved data, more exactness in processes and in reasoning, and the light due to recent discoveries and inventions, now take the place of old stereotyped traditions and superficial appearances. We were even now witnessing the birth of a new philosophy of the universe, which might be designated "The Electrical Philosophy." This philosophy was not devoid of mysteries and difficulties, but time may be trusted to remove them. It simplifies so many problems, clears up so many obscurities, opens up so many extensive ranges of new investigations, and contrasts so strongly with the complexities of the older explanations as to leave little liberty of choice between them.

Postal Telegraphs.—Congressman Rayner, replying to Mr. Powderly's inquiry regarding the status of the Postal Telegraph bill, says : "I agree with everything you say in reference to Government postal telegraph. I shall press this measure with all the zeal I can command. The time has come for action, and the proposition before the House will be whether they will permit a bill of this magnitude to be suppressed under a technical construction of a rule of parliamentary procedure. The Post-Office Committee, as I understand, will make the point that the Committee on Commerce has no jurisdiction to report this bill. I am prepared by precedents and otherwise to show our absolute jurisdiction over this subject matter. I shall press the proposition upon Speaker Carlisle to permit the Hous to pass upon this point, and if we can procure a sufficient vote to consider the bill it will then be put upon its passage."

Mr. P. B. Delaney of New York, the well-known inventor of the multiplex system, replying to the remarks of an English electrician who in a recent issue of the *Electrician* of London, charged that the Americans, whom he had engaged and whom he supposed to be such eminent men, are possessed of considerably less theoretical knowledge than an ordinary telegraph operator in Scandinavia, says : "The American telegrapher needs no defense at my hands. He may not have as much theory as his Scandinavian brother, but he knows a practical telegraph system when he sees it, and it is well known that he can send more into and get more out of a telegraph wire than any other telegrapher in the world."

The new electric motor for propelling street cars will soon be tried on the Lombard and South streets branch of the People's Passenger Railway Company, Philadelphia. Workmen are now busily engaged relaying the tracks with the new rail used for cars provided with the Wharton motor. Eight-wheel cars instead of four will be used. They will be large enough to comfortably seat thirty-four persons. The weight of each car will be 14,600 pounds. An experimental car will first be run on Fourth and Eighth streets, and if it is found practical the cars will be operated on the Lombard and South streets branch.

Edison's Latest Talking Machine.—Thomas A. Edison is not bothering with phonographs and such-like just now. There is a new life at his home. It's a girl's life and it began June 1. If the phonograph is any good at all it will register the first "Papa" that comes from the baby's lips, and the magic word can go on file for whole generations after "the wizard." The baby weighs eight pounds, which is no measure of the load of joy it has brought into the Edison household.

The Pennsylvania Railroad has recently built at its Altoona shops a fifty-ton car specially designed for carrying wire cables for street railroads. The weight of the empty car is 51,800 pounds. The weight is distributed over sixteen wheels.

A New Orleans dentist, by apparatus of his own invention, uses the electric current of a central station to run his dental tools, cool the office by means of a fan, and to heat the water required for the operator's use.

The record of train accidents in April includes forty-nine collisions, eighty-three derailments, and four other accidents, a total of 136 accidents, in which 42 persons were killed and 191 injured.

The discovery of electric welding has suggested the welding together of ends of rails so as to make continous rails of 1,000 to 1,500 feet in length.

The London and Northwestern Railway, which owns the Shropshire Union Canal is about to try locomotives to draw the canal boats instead of horses.

WANTED.—Telegraph operator, capable care and repair telephonic apparatus, under two years' contract, as clerk with responsible corporation in Central America. Knowledge of Spanish desirable. Address BY LETTER, stating references, age and qualifications.

"HONDURAS," Electric Age Office.

POSTAL NOTES.—The AGE in its new dress, enlarged sized, received many compliments from its friends at 187. There is very little variation in the routine, and, in consequence, we find it somewhat difficult to keep the Postal represented. The changes among the extra men are scarcely worth reporting as they change so often and are coming and going all the time. Among the new ones noticed are Messrs. Flint and Boyle of Boston; also G. D. McMartin, C. W. Preston, W. M. Shaw. J. B. Collins and G. B. Armstrong. Although business is still lively they are obliged to report very early to get in their days' work. The electric lights are now working well and are a big improvement. The trouble, which was first caused by their being too near the desks has been remedied by Messrs. M. M. Davis and M. H. Gref, who altered the position of each light.

TRANSFERS.—H. C. Biggs, Washington, D. C., to Philadelphia, Pa.; O. H. Day, Harrisburg, to Altoona, Pa., to take Associated Press report; W. C. Stewart, New Castle, to Mercer, Pa.; Chas. Toy, 1080 Third avenue, to Grand Central Depot, Yew York; Jas. Bolkwell Comber, to Essex Centre, Ont.; C. I. Phillips. Titusville, Pa., to Buffalo, N. Y., for the W. N. Y. & P. R. R.; J. Brennan, Youngstown, Ohio, to Pittsburgh. Pa., for the Postal; Ed. F. Fagan, Ottawa, Ont., to Detroit, Mich., for the W. U.; H. W. Cleveland, Lyons, to Alexander Bay, N. Y.; F. D. Terrell, Huron, Dak., to Ashland Wis.; W. G. Elam, White Sulphur, W. Va., to Petersburg, Va.; W. J. Hogan, Buffalo, N. Y., to Columbus, O.; Al. Flinn, Kennett, Cal., to Kingman, Arizona; Mrs. A. B. Smith, New York, to Asheville, N. C.

The fraternity was well represented and handled considerable business for the press, at the Democratic State Convention, held at the Academy of Music, May 15. The interests of all were looked after by C. H. Erwin, W. U. superintendent of the city district. The W. U. operators were: A. P. Kranshar, acting chief; Max Green, Tom J. Murphy, M. O. Hoffman, A. J. Heldman and M. J. Fitzpatrick; Charles O'Rourke's City Press Bureau, R. T. McNamara; State Press, W. O. Miles; Bigoney's City Press Association, Chas. Kemp. The United Press was represented by W. T; Loper, manager and chief reporter; Geo. Slater and Martin F. Moore, reporters, and John G. McCloskey, operator.

Mr. J. P. Kohler, the well-known New York telegrapher, for the past three years with the First National Bank, has accepted a position with the Northwest Loan and Trust Company, at Portland, Oregon. Mr. Kohler carries with him to his new home the best wishes of a large circle of friends, who looked upon him as one of the most brilliant lights of the profession in the east. Mr. Geo. P. Bouldon, late with Erie Ry., in the General Agent's office, fills the vacancy.

VISITORS IN NEW YORK.—Mr. Geo. H. Tilly of the Western Union, Helena, Mon.; H. F. Carroll of Cleveland, Ohio; W. B. Richardson of the Panama Railroad. Isthmus of Panama; Mr. Joseph H. Schwerzen of Chicago; James Gilliland, brother of H. T. Gilliland of the Phonograph Company of Adrian, Mich.; H. W. Plum of Chicago, who was the guest of Mr. F. W. Jones.

General Manager G. G. Ward of the Commercial Cable, returned from Europe on the Etruria, June 2nd. The steamer made the quickest passage on record. Mr. Lawrence Olyphant, at one time superintendent of the Direct Cable, was also on the steamer.

ST. LOUIS NOTES.—The enormous amount of work done on a National Convention and the immense telegraphic facilities required to distribute the proceedings of these great national bodies to the press and to the people of the country, may be judged when it is stated that the Western Union Company alone handled and transmitted over its wires news, growing directly out of the Democratic National Convention, to the aggregate amount of 2,151,791 words. This consisted of regular press reports, special dispatches to the leading journals of the country and of bulletins, which were flashed over the wires to every city and town and to almost every village and hamlet in the land.

SYRACUSE NOTES.—P. H. Ryan has resigned and departed for New York. Miss Kittie Slattery has been promoted from check girl to operator at the Leland Hotel. E. T. Pardee transferred from the Mutual Union to the Western Union. F. C. Gilbert has returned from Montana, and is working at the Mutual Union. J. F. Meaney, formerly of this city, now with an Albany broker, is spending a short vacation here. S. H. Bierhardt is with the Syracuse Base Ball and Turf Exchange, W. U. wire. The Postal are furnishing several pool rooms with the ball reports by special wire. Their business has increased sufficiently to admit of the addition of two more operators, who are Miss Landon and Mr. Easton.

WEST SHORE RY. NOTES.—Upon changing the divisions of the West Shore railroad recently, making Syracuse and Coeyman's Junction the division points, the dispatcher's office was moved back to Syracuse from Newark, N. Y., where it was moved two or three years ago. D. B. McCoy is superintendent of the Buffalo division, with headquarters in Syracuse. J. B. Davis is assistant superintendent; W. W. Wheatty, chief dispatcher; G. W. Post, division operator. The dispatchers on the east end are C. Halligan, D. W. Hempstead and T. P. Flaherty. Their assistants are J. W. Whelpton, C. M. Bahn and J. B. Pulver, respectively. On the west, W. F. Ballou, C. Grimes and F. W. Everttts, are the dispatchers, assisted by Wm. McCoy, John Darling and G. W. Goop, respectively. The other wires are looked after by W. H. Fowle, F. R. Johnson and F. D. Brown. They occupy one of the finest telegraph offices in the country. It is finished and equipped in first-class style, and is complete in every particular. J. D. Hobbs is the efficient lineman. At the Syracuse, Ontario and New York office, which is located in the same building, at Syracuse, G. H. Graves is superintendent and W. H. Clark, dispatcher.

BOSTON NOTES.—Mr. E. B. Pillsbury, chief operator of the Postal, has been appointed manager, Mr. C. J. Foley chief operator, and Mr. F. R. Starkey traffic chief. The operators congratulate these gentlemen, as they well deserve their advancement, and wish them success in their new positions. Mr. C. H. Evans, of Elmira, New York, was with us a few weeks, but left for Springfield, Mass., where he will remain a short time and then return to his old place here. Messrs. Dalton and Quinn are with the Financial Company, where they receive the New York and Chicago quotations daily. Mr. J. E. Otto of New York is on the extra list.

PITTSBURGH NOTES—The electric light people and the Postal Telegraph operators recently played a game of base ball. The latter won by a score of 39 to 26. Batteries, Briggs and Colebrook, and Slemmons and Baker. When we see an electric light man now, we ask him what he thinks of the "dude" telegraphers, and he walks off with a far-away look, and says not a word. There have been no radical changes in the office here. Our popular check boy, John Kearins, has secured a more lucrative position as operator with Carnegie, Bros. and Co.

THE ELECTRIC AGE.

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

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WALTER P. PHILLIPS, Editor.
J. B. TALTAVALL, Publisher,
C. H. BOGLE, Manager, Advertising Dept.
No. 5 Dey St., New York.

NEW YORK, JULY 1, 1888.

The Bell Telephone Company has extended its successful experiment of long distance telephony between Boston and New York to the establishment of a line between New York and Saratoga, between which points it is competing with the Western Union for public business. The rates charged are rather steep as compared with the modest tolls of the telegraph company, but the compensating advantage to the customer lies in the fact that he can obtain a much quicker service and at the same time minimize the chances of his message falling into other hands than those of the person for whom it may be intended. But the supreme advantage of the telephone system is in there being no doubt or uncertainty of the conversation or liability of error whatever. The telephone tariff ruling between Boston and New York is $2 for each five minutes or fraction of that time consumed in conversation, and the number of customers obtained and retained at that figure has encouraged the company to fix its rate between New York and Saratoga at $2.50 for the same time consumed though the distance is less than between the points first named. The discrimination in rates is undoubtedly due to the shortness of the Saratoga season, which is limited to about two months, in which time the company must be reimbursed for the large and necessary outlay. Whether the Western Union will see fit to resent the encroachments of a rival which has hitherto been quite generally looked upon as an ally, or whether, indeed, in view of the recent successes of the telephone company, the elder corporation feels equal to the severe strain an open fight with such an adversary would entail, is a matter to be made plain to the public only by time. One thing is absolutely certain, however, that the Bell Telephone Company is in the general telegraphic field with the intention of remaining there and if possible revolutionizing the business of telegraphy. As further evidence of the staying qualities of the telephone company, we might mention that already two Saratoga wires have been leased to influential New York houses with the prospect of a third wire being taken by another well-known establishment. It begins to look as though the Bell people will have more leased wires to Saratoga than the Western Union. To the Bell company the leased wire feature is prominent and important, a large revenue being derived from that source.

A BOY'S REVENGE.

In reprinting a specimen of the reportorial work of one of the many operators who have gone into journalism, it may not be out of place to say that one of the reasons why telegraphers are succeeding as newspaper writers is that they have some originality. Mr. Curtis's plan for ascertaining just how the man and brother is treated by New York hotel-keepers smacks of genius and shows that an occupation which ir volves chasing a bug from rheostat to condenser and thence to some adjacent repeater requires quite as much intelligence and persistency as it does to work up a good story or get an interesting interview for newspaper purposes.

Mr. Curtis, by the bye, is the young man who succeeded, a few years ago, in capturing a silver sounder which Jesse Bunnell offered as a prize for fast sending. Probably while Curtis's record has been broken by Roloson, Gibson and Kihm, there is no operator in the country who sends more exquisite Morse. It is as smooth as oil and as musical as one of Strauss' waltzes. It is said, too, that this impersonator of the emancipated became a great sender not because he had any aspirations to achieve a national reputation, but because he had a grudge against a man with whom he intended, before he died, to get square. It seems that when Curtis was a boy in a Kansas town, his mother found him employment in the telegraph office. His father had been killed in the war, and being thus without anyone to protect him, a hard-hearted manager under whom he worked abused him shamefully. Curtis swore vengeance, and he determined that "some day, somehow" he would learn to send so swiftly that by some combination of circumstances he would get a chance at the manager aforesaid and simply slaughter him. When he could telegraph fairly well he went to Ogden, and reaching New York in due course he soon became famous.

In the meantime the natural meanness of the man who had abused Curtis as a boy had gotten him into trouble with his superiors, and he had been removed as manager and had gone to Chicago and accepted a position as an operator. He struck the New York quad. eventually, and Curtis struck it about the same time. The siege lasted four or five hours and the victory was complete. The boy who had been dedespised, triumphed over the man who had, with provincial conceit, regarded himself as the equal of Ayres, Eitemiller and all the invincible host of whom he had heard. He begged for mercy and got none. The youngster was inexorable, and the Chicago chiefs came and listened to the sending and pronounced it good. There was only one way out of the difficulty and the ex-manager had to be taken off the wire. Since then Curtis has lost all interest in telegraphy and has now given up the business for the more congenial occupation of writing for the press.

ELECTRICAL PATENTS.—The number of applications for patents on electrical appliances is phenomenal. During the week ending May 29th, says the *Scientific American*, seventy-three patents were issued from the Patent Office. A general subdivision into various recognized departments is interesting, as showing those in which inventors are most busily engaged: There are fourteen patents relating to instruments and devices of measurement and testing, two to telegraphy, two to the telephone, three directly to the motor, four directly to the galvanic battery, four directly to the secondary battery, one to a thermo-electric generator, 26 to dynamos and electric light apparatus and the transmission and distribution of electricity for purposes of light and power, seventeen to miscellaneous applications. Among those relating to electric light apparatus are quite a number covering a whole alternating current system.

THE MENDICANT OPERATOR.

R. W. MARTIN.

At no time in the history of the telegraph has the mendicant operator been so numerous as now, and at no time in the existence of that pest has he been so persistent in his importunities. A few years ago this species of annoyance to toilers in an honorable calling was confined to a few periodical callers at telegraph offices in the larger cities and towns. These fellows were so well-known and so regular in their visits as to enable their intended victims to avoid them, or, if cornered, to rear upon countless sums unpaid a wall of indignation behind which it was possible to escape further payment of tribute to dissolute idleness. But with the type of mendicant at present heaping disgrace upon the profession of which he is constructively a member—his connection therewith consisting almost wholly in the fact that he is possessed of ability, though not of inclination, to work a wire—it is vastly more difficult to deal. This solicitor of undeserved alms disdains the supplicating manner assumed and placating methods employed by the old-time beggar whom he has supplanted. He doesn't waste time awaiting the hour when his prey shall be "off" and he may pour into his ear a soul-harrowing tale of patient suffering from the injustice of the chief operator, the brutality of the manager, or the cruelty of the superintendent. Not he. He calmly walks to the door of an office and calls his victim out, unless the door be unguarded, in which case he boldly walks in and in a manner scarcely less positive than that of the far-western road agent who commands you at the muzzle of a revolver to "throw up your hands," demands upon the ground that he "worked the Short Horn duplex at 'O G.' in '79," contribution to his support in idleness, often from a man who is barely able to maintain himself and his dependents by working day and night.

It is the conviction that the proportions to which this evil has grown is not fully realized that impels the writing of this article. It is no exaggeration to assert that the number of telegraphic beggars varying in degree of condition and mode of "working" from the abject suppliant to the novitiate highway robber is higher in New York by fifty per cent. than it has ever been before, and we are assured that the other large cities show a proportionate increase. Hitherto it has been presumed that these fellows prayed only upon old acquaintances, but the discovery has been made that they have adopted a system similar to that in vogue among the tramps who infest country villages in summer time by which the houses of the charitable may be distinguished from those whose occupants keep vicious dogs. A well-known telegrapher who in the goodness of his heart has for a long time permitted himself to be fleeced by these wingless vultures tells of his astonishment a few nights since to find among his callers an entire stranger who lowered the torrid temperature to the freezing point by the breezy manner in which he stated the object of his visit. "I've been drunk," said he, "and have carried the banner four nights. I'm a stranger to you, but the boys all say you're a good man to strike. I want you to help me out." He was promptly "helped out," but before reaching the stairway demonstrated by greatly accelerated speed his ability to dispense with further assistance.

Telegraph operators are conspicuously charitable, and their cheerful alacrity in coming to the relief of a deserving fellow craftsman in distress is known far and wide, but the time has arrived when greater discrimination should be exercised in bestowing aid, for undoubtedly it is to their unquestioning generosity that the rapid development of the shiftless worker into the confirmed tramp is due. The self-respecting, industrious member of the profession owes it to himself, to his family and to his employers to use every effort to elevate and maintain his calling upon the highest possible plane of respectability, and in no more effective way can this result be accomplished than by combining to banish the mendicant element from any connection whatsoever with telegraphy. Once give these fellows to understand that they can no longer subsist upon the earnings of their former associates and they must perforce seek other fields or reform and return to the fold. If they do the one, very good; if the other, so much the better. In either case good will have been accomplished that cannot conceivably be brought about by any other available means.

WANTED—A ROOM.

(DE).

Some time ago I posted the following notice on the bulletin-board in the coat-room of the Western Union;

WANTED—A nice, comfortable room in a quiet neighborhood. Reasonable terms.

Some of the answers I received amused me, others startled me, while several of them were decidedly odd in their way. Here is one of the first I received. The writer was evidently under the impression that perhaps a little religious instruction would do me good:

"Sir: I have a good room to spare at reasonable rent, and, as I know you to be a gentleman of refined instincts, I don't hesitate to accept you as a tenant. There is a church within three doors of the house, and the pastor holds prayer-meetings in my parlor every Friday evening, to which you will be welcomed as a brother."

Another wrote: "I can give you a nice back parlor, southern exposure, two towels a day during heated term, and other luxuries. If you are fond of a nice, quiet game, you will find a sociable party at the house every Sunday evening—50 cent limit, table stakes; draw off only on aces up or better."

This was from a designing widow:

"Dear sir. I have an elegant hall bedroom in good locality. No cats in the back-yard. Rent very cheap. As I am alone in the world, the knowledge that there is a man in the house will dispell all fears of burglars or other nocturnal intruders. Ring the bell three times."

A fellow in Harlem wrote as follows:

"I have a large room suitable for two, and I think we can double up and make it light for both of us. The house was formerly used as a morgue, but that need not disturb your slumbers."

A man in Brooklyn sent the following:

"I can give you a nice room with all conveniences, pleasant surroundings and other attractions, but I draw the line on the 'growler.' The last fellow I had died here with the jams, and I don't want any more of it. If you are temperate call and see me."

Quite a number of the answers informed me that I should be required to furnish references as to my character, etc. One fellow submitted a list of questions that would have done credit to a civil service examination, and another landlord had the audacity to ask me if I had ever been arrested for any crime. He said one could not be too careful in taking in strangers. Another intimated that a large-sized trunk would be presumptive evidence of sincerity of purpose on my part, and he hinted that there was no means of escape from the rear of the house in case I decided to vacate the premises abruptly and incognito.

I have made no selection yet. There are several unoccupied barns in East New York that look very inviting to a homeless telegrapher, and perhaps I will take up my abode in one of them.

On June 23rd a fire broke out in the operating room of the Canadian Pacific Telegraph Company's main office at Montreal which completely ruined the place together with the instruments and switch-board and compelled the company to suspend business at that point. The fire department could do nothing but prevent the flames from spreading. The loss to the company will amount to nearly $20,000.

SCIENTIFIC ANARCHIST.

That is What Dr. Pohlman Calls Dr. Rogers in Using Up His New Electrical Philosophy.

On the invitation of the Buffalo Electrical Society, Prof. Pohlman addressed the members of that body June 18th, in reply to the new electrical philosophy propounded at its last meeting by Dr. H. Rogers of Dunkirk, who undertook to prove that all physical phenomena and every conceivable form of force were intimately identified with electricity, which theory he contended, was the only one capable of solving all the problems heretofore met with in physical science.

The undertaking, remarked Prof. Pohlman, was truly a gigantic one, but in the realms of science as in many other spheres, there were to be met with once in a while persons of anarchistical tendencies and gaseous importance, who consider it the work of their lives to overthrow all knowledge, and modify it according to their own little views, even though the application of a quantity of dynamite be necessary for the accomplishment of such purpose. It was fortunate for the state of our knowledge that these scientific anarchists were less dangerous than their political brethern, for the dynamite they use produces only a self-inflation of the individual using it without doing further harm.

A new theory to be acceptable should at least be able to explain the various phenomena as well if not better than the old one. Although the new philosophy of Dr. Rogers teaches that electricity explains everything, the lecturer would demonstrate to the entire satisfaction of his audience the utter fallacy and absurdity of the kind of reasoning applied to the investigation and explanation of some of the phenomena alluded to in Dr. Rogers's paper. There was gravity, for instance, which was claimed to be purely an electrical phenomenon, because all bodies susceptible to electrical excitation become centers of excitation; but the assumption upon which this theory is based, viz.: that the vacuous space between the earth and sun is a good conductor of electricity, is not borne out by practical experience. Indeed, it is a fact well-known to electricians, that an electric current will not pass through a vacuum at all, hence the new theory was untenable. The elliptical form of the earth's surface was said to be a further demonstration of the electrical character of gravitation, inasmuch as it was claimed to be the result of a mutual magnetic attraction existing between the sun and earth, which action varied in intensity with the relative positions of the magnetic axes of sun and earth. But, remarked the lecturer, one important point had been omitted in the consideration of this question, and that was the fact that the earth's magnetism was neither constant nor stationary, and, therefore, the interactions being of a variable character should necessarily produce irregularities in the earth's orbit, but no such irregularities were known to exist.

A startling theory of the new philosophy was that the sun was neither hot nor bright but only appeared so, and that both brightness and heat were simply transformations of electrical currents in our own atmosphere. In support of this theory Capt. Abney of London, was quoted as saying that at a little over three miles' elevation the sun appears no brighter than the moon; and at four miles the sun's rays were no longer capable of producing the colors of the solar spectrum. The lecturer had been unable to find any record of this famous statement, and was not disposed to accept it as an accurate quotation. Different observers in North and South America, at an elevation of nearly three miles, had failed to see so important a phenomenon, while Prof. Langley asserts that the spectrum at that altitude increases immensely in size. Those who attempt to overthrow and revolutionize an old-established philosophy and advance new theories in its stead, should at least have those theories based upon facts. We were told, observed Prof. Pohlman, as a proof that sunlight is electrical energy transformed, that "electrical rays" focused through a lens will set fire to combustible material in the same manner as the sun's rays when focused through a lens of ice. But he would like to ask if any electrician had ever seen any electrical rays. Were the rays from an electric light any different in nature from those of any other source of light? Evidently they were according to the light of the new philosophy.

If light be only a transformation of electrical energy in our atmosphere, it seemed fair to ask how and why it is that we see all the light apparently condensed in the luminous orb, when the electrical rays of the sun striking one half of the earth should really transform all the atmosphere toward the sun side into an ocean of light, the intensity of which would depend upon the condition of the air.

Prof. Pohlman, whose discourse was very exhaustive and expressed in a highly vigorous though humorous manner, concluded by remarking that poor benighted mankind, which according to Dr. Rogers, was so fearfully and wonderfully bound by ancient traditions would still insist in preferring the conclusions and teachings of world-famed masters in physical science to those of one whose views are formulated upon inaccurate and insufficient data, and whose theories are merely speculations without any scientific foundation.

ELECTRIC NIGHT SIGNALS.

The system of signals by incandescent electric lights as recently adopted in the German and Italian navies was exhibited by Lieutenant W. H. Beehler, United States Navy, on board the United States steamer *Atlanta* at Annapolis last week during the graduating exercises.

The electric lamps are used in the three lanterns twelve feet apart, hoisted at the masthead, and the lights are displayed by means of a switch box to open and close circuit through the combination of lights to make the desired signal. The lamps are arranged in pairs of one red and one white Edison lamp. Each of the three lanterns contains a pair of lamps and no two lamps in the same lantern are displayed at the same time.

The fourteen combinations possible are as follows:

White, 1.
Red, 2.
White—red, 3.
Red—white, 4.
White—white, 5.
Red—red, 6,
White—red—red, 7.
Red—white—white, 8.
White—white—red, 9.
Red—red—white, 0.
White—red—white, correct.
Red—white—red, preparatory.
White—white—white, answering.
Red—red—red, interrogatory.

The system is readily adapted for the general naval signal book and telegraphic dictionary like the flag numerals of day signals. In order to make any signal, the message is first sought in the signal book, and the number corresponding thereto is then signalled.

For example, suppose the message, "Start fires in all boilers at three A. M.," be numbered 6,487. It would only be necessary to turn the index over 6, red—red, raise the knob and keep it up a few seconds, depress and turn the index over 4, red—white; raise the knob and keep it up a few seconds, depress and turn the index over 8, red—white—white; raise the knob and keep it up a few seconds, depress and turn the index over 7, white—red—red; raise the knob and keep it up a few seconds and depress.

The Junior Edison Association held its last meeting, by special invitation, at Mr. Edison's laboratory at Orange, on June 15, when Mr. A. E. Kennelly delivered a lecture on new methods of finding faults in underground wires. Mr. Edison also made a few remarks on allied topics.

THE UNITED PRESS.

"How is it the *Intelligencer* is always ahead in its telegraphic reports of the Chicago Convention?" is a query that has agitated the minds of many of Lancaster's citizens.

It may be well to state that, primarily, the *Intelligencer* is a subscriber to The United Press, an organization that has a complete system of wires, which are tapped in the *Intelligencer* office. The United Press has a direct wire into the convention hall, and every move made by that body is recorded thousands of miles away instantaneously. Ten seconds after a ballot is taken the result is in Lancaster and other large cities. A vast amount of time is saved by the direct system. To relay, or repeat a system of reports, involves a loss of time that means more than the surface views indicate. Thus it happens that The United Press, having a large corps of writers in the hall, assisted by the most rapid telegraphers in the country, is enabled to serve its subscribers with the news with as much dispatch as the modern detective camera reflects the scenes against which it is directed.

During the balloting last week the audience before the *Intelligencer* bulletin board was large enough to partially block the street. With pencil and paper in hand scores of Republican politicians eagerly recorded the results posted the moment after the wires brought them. On Friday night the *Intelligencer* bulletined the news of the convention taking recess until Saturday morning at 10 o'clock. At the other newspaper offices there were meager crowds. When the anxious dozen in front of the *Examiner* were told of the news via the *Intelligencer* they did not believe it, and waited fifteen minutes to see the same bulletin put up before them. The first to post the news of Harrison's nomination in this city, was the *Intelligencer*, and when the bulletin announcing the choice of the candidate was placed on the board, the great crowd of Republicans that stretched half way across South Queen street let out a few cheers.—Lancaster *Intelligencer*.

The evening *Critic* of Washington, D. C., last week issued an extra after every ballot announcement from Chicago, and was on the street from thirty to forty minutes in advance of its contemporaries. It gives The United Press full credit for its part of the work and says: "The bulletin service of The United Press from the Convention Hall has been for the past three days both instantaneous and exhaustive. One second after the development of a State ballot, or the total of the ballots of all the States, or any incident of interest in the Convention Hall, the information was in the editorial rooms of the *Critic*. The United Press operators here copied the information from the special system of wires at several convenient points in the corridor surrounding the Hall of Representatives, and the first information from Chicago reached republican and democratic members by the alert messenger boys who rushed in with the bits of white paper bearing the legend of The United Press."

The Syracuse *Herald* of June 23rd, commenting on the value of The United Press service, says:

"The *Journal* has been disastrously defeated thus far this week by the *Herald* in furnishing the news of the Chicago convention. In its early edition on Thursday the *Journal* had a few paragraphs of the platform, and not a word of the further proceedings. The *Herald* had more than two-thirds of the platform besides several nominating speeches. In yesterday's first edition of the *Herald* the first ballot for President was given in detail. The *Journal* in that edition did not have a word about that day's proceedings. The *Herald's* bulletin of the convention's adjournment was displayed seven minutes before that of the *Journal*. The *Herald* last evening was on the streets several minutes in advance of the *Journal*. The way the *Herald* was read last evening, while the *Journal* was cast aside, was fresh evidence that when news is wanted the people buy the *Herald*."

The United Press service, in its treatment of the Chicago Republican convention, has won golden opinions for its efficiency. The bulletin service, especially, surpassed anything of the kind ever done before. These were sent out all over the country every five minutes, and the people in all sections were thus virtually brought within seeing and hearing distance of the convention. Chicago brags much over her having constructed a hall which accommodates some 8,000 or 10,000 persons. But how much more has The United Press done by making over 50,000,000 people both auditors and spectators, as it were, of the scenes and proceedings of the convention.—*Albany Press and Knickerbocker*, June 26.

NEWS GATHERING A MIGHTY RAPID SCIENCE.

[Chicago Correspondent of the Boston *Globe*.]

Walter P. Phillips and P. V. DeGraw are the managers of The United Press fine work in the convention. Both press associations have reduced convention work to an exact and a mighty rapid science. When the proceedings begin a man is told to follow them for three minutes. When this period ends another man is given the task for three more minutes. Meanwhile number one is getting his three minutes' work in shape and delivering it to the telegraph operator. Under this rule, it is found, when adjournment comes, that the report is never more than three minutes behind. Mr. Phillips and Mr. DeGraw are both graduates of the telegraph key—the former the life and the head of The United Press, and in the enjoyment of a generous prosperity. Mr. DeGraw is the Washington manager of the association, and the man who perfected the service at the capital. The United Press headquarters at the Richelieu Hotel are a palace in themselves, and would have ruffled the equanimity of Solomon in the days of his greatest glory.

THE MAGNETIC CLUB.—At the meeting of the governing committee of this club on June 21 a number of new members were admitted. The club is rapidly becoming very popular, and a grand time is anticipated on July 11, when the next banquet of the club will occur. A large number of prominent people have already accepted invitations to be present, among them Erastus Wiman, W. P. Phillips, General Eckert, General Superintendent Merrihew, Manager Dealy and others.

On April 5th the Iowa Senate passed the House bill forbidding railroads from blacklisting their employes. It makes exception in the case of employes discharged for gross negligence or drunkenness, but provides a stern penalty for attempting to prevent employes discharged for other reasons from obtaining similar work elsewhere. It is designed especially to cover the case of railway employes who are blacklisted for engaging in strikes, or who for any reason incur the disfavor of their superintendent.

Lightning struck the telephone cable house during the thunder storm on June 23rd, melting the thermostats and causing the fire alarm that connects with the operating room of the New England Telephone and Telegraph Company to ring violently. No further damage was done.

NEW YORK AID SOCIETY.—Report of the Auditing Committee of this society for the quarter ending June 6th, 1888:

Balance on hand March 7th, 1888		$1,978 97
Receipts:		
For fees	$39 00	
For dues	593 50	632 50
Total		$2,611 47
Disbursements:		
For sickness	$633 15	
For current expenses	72 61	705 76
Balance on hand		$1,905 71

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

THE ISTHMUS TELEGRAPH.

The Central and South American Telegraph Company's surveying staff is now engaged in locating its proposed telegraph line across the Isthmus of Panama, the company having secured from the United States of Colombia the necessary concessions for operating a line. The obtaining of these concessions is owing largely to the demand of the United States government, the telegraph company having been opposed by the Panama Canal Company. It is thought that any further resistance on the part of the canal company will raise serious international questions,

The new form of the "Law" battery is creating quite a stir among users of open circuit batteries. The ingenious means of obtaining the extraordinary surface in the negative element by making a double cylinder body, that is, one cylinder within another, and at the same time providing for perfect circulation by a vertical slot through both cylinders, is as effective as it is unparelleled. This element the Law Company guarantees for ten years, and, under this guarantee, the saving in renewals is equivalent to the purchase price of any "perishable negative element battery" several times over. We understand many of the largest telephone companies have been using this battery exclusively for a number of years, and speak in the highest terms of it, and it is equally good for any other kind of open circuit work.

The Rogers Auxiliary Fire Alarm Co. has consolidated with the Electric Fire Protective Co., New York. All business will be transacted under the name of the Electric Fire Protective Company. This company at present covers the territory of New York, New Jersey, Pennsylvania, Maryland, Deleware and District of Columbia, but expects soon to cover the whole of the United States.

James W. Queen & Co., 924 Chestnut street, Philadelphia, Pa., has just issued a 72-page catalogue and price list of electrical testing apparatus. It is copiously illustrated, and is a fair display of the enterprise of this well-known establishment. Cuts of the various ammeters, voltmeters, electrodynamometers, galvanometers and other testing apparatus appear to excellent advantage. The catalogue should be in the hands of all electricians.

THE "VICTOR" RELAY.

It is only an ideal sentimental affection or reverence that is ever felt for the stars, the sun, or distant objects that make their impressions from afar. It is a part of the fire worshiper's creed to prostrate before the day god and the madness of the poet to eulogize the queen of night, and on the same line of reasoning we may rationally account for the fact that our sympathies are most actively and healthily moved by the objects that are or have been nearest by actual presence or influence.

It is not strange, then, that the telegrapher's pet instrument is the key, for that piece of mechanism is certainly always at hand.

For the key is often felt the affection that is held for a preferred horse, a pet dog, or better still, for a favorite gun.

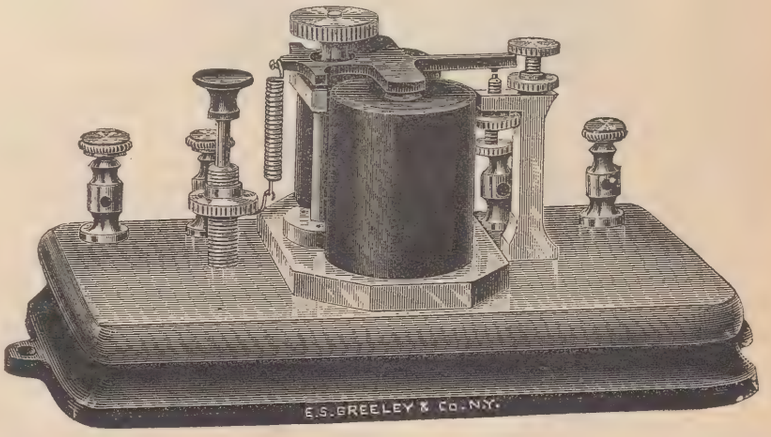
After the key, the operator's attention is directed to the sounder and lastly to the relay.

So it is not the importance of the function, but the immediateness of the relation that things bear to us that command our solicitude. With due care the telegraph key could be even dispensed with and the ends of the wires used to make and break circuit. The sounder, as a sounder, has no practical being without the relay, through which instrument its manifestations become possible.

Yet, who ever heard of an operator patting or taking an especial pride in his relay. Nevertheless, the relay is the most vital piece of machinery that is mounted on his desk.

The same man who knows every thread on the adjustment screw of his key, has the configuration of the contact points photographed upon his retina and knows the location and extent of every spot of ink on the lever, could hardly tell you whether the adjustment spring of his relay is tied up with gossamer silk or a shoe string.

With a full knowledge that the telegrapher indulges in no gush over the instrument, we know also that he appreciates the importance of, and is alive to all constructive and electrical improvements that are connected with the relay, and for that reason we bring to his attention in this issue an illustration and description of the Victor Relay, which is a marked departure from the more familiar Western Union pattern of the same instrument.



THE "VICTOR" RELAY.

The essential requirements in a relay are a susceptibility to the fluctuations of magnetism—a readiness to charge and discharge—an absence of physical inertia, and a uniformity of action. These three points have been provided for in the Victor pattern to an increased extent.

The lever bearing the armature is sustained in a horizontal position in the Victor instead of perpendicular, and in this way obviates the axial disturbance and alteration in gravital force incident to the action of a perpendicular lever whenever it crosses or approaches the node.

Inertia is greatly decreased by the fact of the armature being mounted upon needle points, the plan which is adopted in making magnetic compasses which are required to be sufficiently delicate to obey terrestrial magnetism. It is needless to state that the needle method of mounting gives the utmost delicacy and freedom of action, while the horizontal lever secures a uniformity of conditions at the axis.

We are advised that the Victor Relay of the future is to be made with a non-magnetic lever, the only magnetic metal used being in the armature itself, which is, however, only a return to first principles, which should never have been deserted by the practical instrument builder. The value of these various considerations is recognized when we reflect how small and weak is the proportion of electric force that reaches the relay and is depended upon to actuate it on long and leaky lines.

In addition to these substantial mechanical and electrical improvements we note on the Victor Relay a new and useful device termed the "searcher." The "searcher" consists of a spring plunger with an ebonite top, which permits the gamut of diverted current on the line to be quickly run and so avoid all danger of breaking in on some one writing on a higher adjustment, and in the same way facilitates a sender on a hard "press" circuit, keeping all the stations who are "copying" within easy range.

The Victor Relay is a sister invention to the Victor Key, and our attention has been drawn to it by the encomiums passed upon the instrument by the operators at the New York office of The United Press, where the Victor has been introduced and is well received.

The E. S. Greeley & Co., of New York, are the manufacturers.

THE NATIONAL PRINTING TELEGRAPH.

We are indebted to Mr. E. W. Applegate, the supervising electrician of the National Printing Telegraph Company, for the cut of their instrument, with a brief account of the S. V. Essick printing telegraph system, which is owned by the National Printing Telegraph Company of New York.

The claims set forth for this system of telegraphy are not mere theory and speculation. Actual work has been done over the Postal Telegraph Cable Company's lines bebetween New York and Pittsburgh, and also New York and Philadelphia—messages being transmitted both ways and printed in Roman characters in page form—which demonstrates the success of this system for practical every-day work over long or short lines.

The advantages of the Essick Printing Telegraph system may be briefly stated as follows :

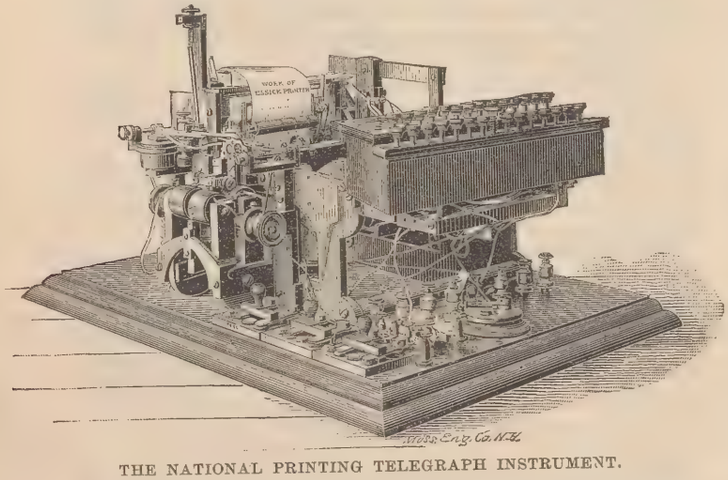
1st. It is an electrical type-writer, by means of which the message is printed in the presence of the transmitting operator in page form, and a duplicate of the same is printed at all receiving stations on the line, whether it be a long or short circuit.

2d. It is a news printer, by the use of which the current news may be distributed for the benefit of the press in the various newspaper offices. A single transmission prints the same simultaneously, in page form, ready for the compositor's case, in all the newspaper offices in the city.

3d. It is a news ticker for the distribution of the current commercial and financial news to public places.

The advantage of the page system over a tape printer will readily be seen when it is understood that the entire transactions of the day are condensed within a small space in a form convenient for reference or file. It will not be necessary to scan a mile of tape in order to find a single quotation.

4th. It is a system practicable for general telegraph purposes and puts within the reach of telegraph corporations a means of reducing the working expenses of the operating department fully one-half with no loss in time of service.



THE NATIONAL PRINTING TELEGRAPH INSTRUMENT.

No previous training is necessary to operate it, and no attention whatever is required at the receiving stations farther than the collection of messages by check clerk, to be copied and sent to delivery department.

5th. A system highly commendable for railroad service, where necessity almost compels railroad companies to put up with cheap labor—consequently inferior ability.

Train orders and other important matter can be sent without error and relied upon as being received correctly.

6th. It will unquestionably take the place of the telephone to a very great extent, owing to the advantages over the present telephone system. A record is made of all transactions for reference. Absolute secrecy may be had in all business dealings, and the annoyance of calling up and being interrupted by others waiting for the line is entirely overcome.

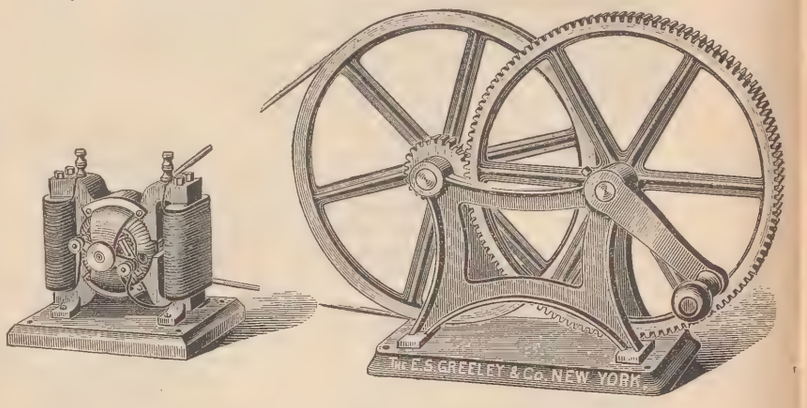
Messages can be sent and received day or night without the presence of the person for whom the messages are intended.

The Company is now ready for the introduction of its system into public use and solicits the investigation of persons who desires a safe, certain, practical and economical system of inter-communication.

The instruments can be seen in actual operation, receiving and transmitting messages between New York and Philadelphia, at the Company's offices, 169 and 171 Broadway, New York City.

THE YOUNG HERCULES DYNAMO.

The small dynamo which we herewith illustrate has been named the Young Hercules, by the manufacturers, The E. S. Greeley & Co. of this city. The machine is admirably adapted for experimenters, schools, laboratories and by people who require spectacular effects for short lengths of time, for show windows and theatrical purposes.



The voltage of this dynamo is 60 and it has an amperage of 4, and by the application of power will light up six regular 20 volt lamps of 16 candle-power each, arranged in a series of three and two multiples. Even when operated by hand there is no difficulty in obtaining the required speed to light up four such lamps, two in series and two in multiple. The gross weight of the hand power itself is considerably less than 25 pounds, while the weight of the dynamo is 11 1-2 pounds, making it, all in all, a very portable apparatus and one easy to set up and dismount.

An old operator says that "Telegraphers are born, not made ; there are some men who can never learn telegraphing." So there are, so there are, and oh, how often, how earnestly do we wish there were more like them. This feeling comes over us most strongly when we are handed a message saying : "To Povert J. Jebberntt—Povd nxx quod not said lldint wrxly to-morrow evening morltd tbbly Collect $1.85." Then it would do us more good to hear that one telegrapher had died than to learn that 50 had been born.—*Bob Burdette.*

The Brattleboro Telephone Exchange is connected with the telegraph office at Brattelboro by a private telegraph line placed there by the Western Union for the purpose of sending press direct to the Springfield *Republican*, at Springfield, Mass.

A lodge of the Order of Railway Telegraphers has been organized at Birmingham, Ala. The Order is booming all over the South.

Captain R. Draper, of the cable steamer *Monarch* died at Belfast, Ireland, June 3.

DISGUISED AS A NEGRO.

[Wm. J. Curtis, in the New York *World.*]

A short time ago a nice-looking, well-dressed negro was ejected from an ordinary downtown restaurant simply because he was a negro. The proprietor ordered the waiters not to serve him. Hardly a good hotel in the town would receive his custom. This was an odd state of affairs, so a *World* reporter last week disguised himself as a well-to-do negro and made the round of New York's swell and aristocratic houses of public resort to report upon the reception he received and how he was served, if he was received at all. And this is what he saw:

After three hours spent in "making up" I walked up Broadway to Madison Square and engaged a cab. Mr. Monahan was in charge of the ribbons, and as he is a very discreet old gentleman, he entered into the spirit of the thing at once. He drove around a couple of blocks and dropped me at Delmonico's. And here the troubles of the counterfeit colored man began. As I started up the steps of New York's swell restaurant and saw through the windows the array of beauty and fashion surrounding the tables inside, my nerve commenced to ooze out of my finger-tips. But realizing that this would never do, I pulled myself together and broke the ice. As I passed the desk the cashier and one or two flunkies appeared to have been stricken with paralysis. They were so agitated that they could not have discovered the fraud with magnifying glasses. I walked into the large dining-room facing Fifth avenue. The ladies and their escorts at the adjoining tables looked absolutely horrified as I took a seat at one of the tables as nonchalantly as if there were really no predjudice against a black skin. The correct French waiters were panic-stricken. They stood about and jabbered in undertones to one another, and seemed undecided as to what course to pursue. One thing was absolutely necessary, and that was to remove the obnoxious colored man from the presence of the swell male and female diners as soon as possible.

Finally a little, stout, smooth-shaven waiter recovered his senses sufficiently to approach and ask me what I wished.

"Bring me some soft-shell crabs and a bottle of ale," I answered.

"You vill excuse me. Ve nefer serve shentlemen not accompanied by ladies in dis room. If you vill enter ze other room you will be served."

"Very well, sah," said I, and I then proceeded to the cafe.

A number of men-about-town were sitting about the tables dining and wining, and several of them looked aghast at the entrance of a negro. A tall waiter asked me what I wished, and I ordered a chicken sandwich and a cup of coffee. After taking my order he proceeded down the room and paid me no further attention. Realizing that it was a case of freeze out, I called to another waiter, who, in turn asked me what I would have.

"I will have what I have already ordered," I indignantly replied. "This is a queer first-class house where a guest is obliged to give his order a dozen times, sah. I ordered a chicken sandwich and a cup of coffee."

"We have no more chicken sandwiches to serve," he replied.

Although they may refuse to serve colored people in swell places, they go about it very gingerly and use repeated prevarications to keep themselves within the law.

"That is not so," I replied. "and I demand that my order be served, or I know the reason why."

"Well, sir," said he, "I cannot serve you. You had better see the manager."

I went up to the desk and demanded an audience with the proprietor. The cashier with a grave face assured me that he was not in and would not arrive until very late. I then demanded a reason for not being waited upon and not receiving the food I had called for.

"I have come from Cuba via New Orleans, Chicago and other large cities, and have always put up at the largest hotels. Why, then, am I refused in this house, which is said to be a first-class hostelry? Is there no manager in charge of this restaurant? It must be in charge of some one, and I insist upon seeing him," I said, with some force of language.

"The manager is now dining with some ladies, and it will be some time before you can see him," the cashier replied.

"Very well," I answered, "I will return later for a reason for this conduct, and if it is not satisfactory the law will be appealed to." I then departed, much to the relief of the cashier and his underlings.

Monahan was then called and I was wheeled up and down Broadway, stopping at the Hoffman House. My nerve was wholly restored by my experience in Delmonico's and I was prepared to go anywhere. I walked through the long corridor, followed by the inquiring gaze of numerous loungers, and stopped at the marble desk. Good-natured Mr. Percival was in charge and a look of dismay crept over his handsome features when I remarked: "Hand me the register and a pen, please. I wish to secure a comfortable room on the second floor."

With never a blush at the magnitude of the falsehood, he informed me that there wasn't a single vacant room in the hotel.

"Well! This is queer," I answered, "I have just come from New Orleans, and I was informed on the train that the Hoffman House was a very high-class hostelry, sah. And you inform me that you cannot accommodate me with an apartment."

He solemnly assured me that he was extremely grieved that such was the fact. I then asked him if the lunch-room was open, saying I wished a bite to eat. He said certainly I could get something for the inner man and pointed out the cafe. I went into the room, sat down and ordered a light lunch. To my utter astonishment the waiter at once proceeded to fill my order, and here was the only place that I was served in my whole journey. Edward Stokes deserves the thanks of the colored race.

From there I was wheeled down Fifth avenue to the old and aristocratic Brevoort House. The cab stopped and I ascended the stone steps of the famous hostelry. The hall-boy stared at me, as if I were some supernatural being, and the porter looked utterly dumbfounded. When I walked up to the desk and asked for apartments, however, the look of pain on the features of the clerk was absolutely distressing. In husky tones he informed me that there was not an empty room in the house.

"Are you certain that you cannot accommodate me, or is it that you do not wish to," I asked him.

"I am sorry, but there is absolutely not a vacant room in the house."

I said very well, that I would look elsewhere, and started out with a troubled conscience at the thought of the deep sorrow of that clerk at not being able to shelter me for the night.

The cab then took me to Dorlan's oyster house, on East Twenty-third street. I tripped lightly over the sidewalk and into the brilliantly lighted house. My entrance created consternation among the employees. The cook let an oyster stew boil over into the coals and a waiter nearly dropped an armful of plates. I walked back into the room, and, taking off my hat, hung it up, as none of the waiters were near enough to hand it to them. After waiting a few moments for them to make up a plan of action, a fat waiter approached me in a hesitating manner and asked what I wished. I told him to fetch a dish of scallops and a bottle of lager. Upon this he solemnly assured me that they did not do any cooking or serve guests after 11.30 o'clock. I remarked that there was a number of guests who had just come in and that, if my eyes did not deceive me, the cook was still preparing the luscious oyster for guests. He then pointed to the

clock and with the most laughable gravity informed me that it was two minutes past 11.30, and that under the rules of the house it would be impossible to serve me. So I left the place amid the ill-concealed titters of several young women on the upper floor.

Next I rolled over to the Fifth Avenue Hotel, fully determined to put up there for the night. I walked through the long corridor to the desk and stated my wishes. I was again informed that with all their hundreds of rooms there was not a single one vacant in the whole house. This was becoming a chestnut, and I merely remarked that they must be doing a rushing business. I left, remarking that either New York hotel clerks are an awful set of liars or that transient travel must have reached proportions heretofore unknown, when at four of the largest hotels in the city not a single sleeping apartment could be secured. A later investigation proved that my first surmise was correct and I have since offered up a prayer for the delivering of the souls of those wicked hotel clerks from the eternal fires of sheol, to which they must ultimately be subjected.

I determined to make one more attempt, however, and was driven up to the Hotel Brunswick. I walked back to the desk and my reception here was a decided change from my former experience. It was a relief, to say the least. The clerk is a big, bullet-headed fellow, with close-cropped hair, who is inclined to be rather tough. When I asked for a room he smiled a hard smile at me and asked "Where did you get it?"

"Get what, sah?" I replied.

"That collar and your nerve," he replied. "I am not here to joke," I replied; "I want to know whether I can get a room here or not."

"Well, hardly," he said. "You can get one on South Fifth avenue, I guess."

When I demanded to know why I couldn't get a room he evidently remembered his catechism and gave me the same old answer of "No rooms vacant." As I went out I heard him remark to a friend, "Well, that coon's nerve takes the cake."

I made up my mind that I would not be able to secure sleeping quarters in any of the large hotels, so I thought I would go to the Hoffman House bar and get a good drink of mellow rye whiskey and go home. I was driven up to the Twenty-fourth street entrance and entered the wonderful bar-room. Sitting at a table was the renowned "Billy" Edwards filling a dude's ears with tales of great mills of the past. "Dooney" Harris, the veteran prize-fighter, "Joe" Coburn, the manager of the bar-room, and gray-haired gentlemen were standing in a group at the end of the bar. The attention of all was attracted by my entrance and I got a scrutinizing weighing-up.

"I would like a drink of your best whiskey," I said to the white-aproned bartender. He stood and gaped at me, but made never a motion to comply with my request. I then made the same demand of another bartender. They seemed to be suddenly turned into statues. I indignantly asked the cashier why I was not served. He ordered one of the barkeepers to fill my order. The superintendent, whom I was observing out of one corner of my eye, held up one finger to the bartender and said in an undertone, "One dollar." This was for the purpose of charging me a dollar for a glass of whiskey. It was intended as a prohibitory price, and I would have paid it, but the bartender, who had evidently lost his senses, said, "We don't serve anything after 12 o'clock."

"It is only a few minutes after 12, and I see numerous parties standing about drinking. That's no excuse sah," said I.

"Oh, no. The only party that is drinking is the superintendent and his friends," said the bartender.

This struck me as being rather funny, and when he absolutely refused to sell me the whiskey I turned about and left the gorgeous hall. And here was the only place that any one had a suspicion that I was made up. And that was Joe Coburn. After I went out he said to his friends that he didn't believe I was a negro. That I didn't walk or carry myself like one. A discussion arose, some claiming that I was a bona fide colored man, and the bartender received a lecture for not charging me a dollar for the drink. Joe finally offered to bet that I was made up, but as I was gone and there was no way to prove it, no one took his bet.

At the theatres colored people are sold seats without any attempt being made to prevent them from entering the theatre.

I drove off to my own apartments and consumed an hour in washing and scraping the black from my face, which was anything but an enjoyable task.

The results of my enterprise proved that the old prejudice against colored people is as deep-rooted as it ever was, and it will probably never entirely die out. While the hotel people would as gladly accomodate colored people, they are obliged to refuse to do so to protect their own interests. If they served a colored man their other guests would leave in a body and the reputation of the place would be very materially injured. While they refuse to receive colored people, they do it as kindly as possible, so as not to hurt their feeling and also to keep out of lawsuits. The general plan is to say their rooms are all occupied, or put a prohibitive price on everything a colored man asks for. It must be said, however, that colored people in New York as a rule do not seek the hospitalities of the large hotels, but are content to patronize the places devoted to their exclusive benefit. Whether they will ever demand that the letter of the Fifteenth Amendment be strictly complied with, time alone will tell. But that the aversion to mingling with the colored race is as strong as it ever was there cannot be the slightest doubt.

TRAIN DISPATCHERS IN ANNUAL CONVENTION.

The fifth annual meeting of the American Train Dispatchers' Association was held in Louisville, June 12, where a reorganization was effected.

The following is a list of the members in attendance:

C. H. Hustin, Newton Falls; E. J. Hackenbery, Cambridge; L. N. Yelton, Rochdale, Ind.; J. E. Doud, Albany, N. Y.; G. H. Schleyer, Crawfordsville, Ind.; E. D. McKean, Ashland, O.; R. B. Woolsey, Terre Haute, Ind.; J. W. Pelot, Garrett, Ind.; J. S. Converse, Richmond, Ind.; Hugh Daly, St. Thomas, Ont.; W. F. Packard, Stanford, Ky.; E. B. Zeigler, Bucyrus, O.; J. M. Host, Columbus, O.; A. M. Dilley, Ellinwood, Pa.; F. J. Buskirk, St. Cloud, Minn.; W. S. Fulmer, Rock Island; F. P. Van Cleaf, New York; W. W. Polk, Watervalley, Miss.; W. H. Graves, Wenona, Minn.; W. C. Sutherland, Atchison, Kas.; C. M. Coomer, East Saginaw, Mich.; W. D. Minthorn, Logansport, Ind.; H. H. Libbe, St. Joe, Mo.; F. L. Cherry, Richmond, Va.; J. R. Dearth, Galion, O., J. H. Carlisle, Richmond, Va.; F. J. Benthall, Boston; C. L. Pasco, Bradford, Pa.; D. E. Spangler, Columbus, O.; H. O. Paul, Columbus, O.; V. Menny, Columbus, O.; G. M. Sanderson, Canton, O.; W. D. Sherwood, Norwalk, O.; S. N. Hurd, Huntingburg, Ind.; E. W. Grill, Huntingburg, Ind.; H. J. Irwin, Boone, Ia.; A. A. Zion, Indianapolis, Ind.; Charles C. Wamsley, Houston, Tex.; L. B. Carll, Trenton, Mo.; C. A. Batterton, Winona, Minn.; J. F. Clepper, Paducah, Ky.; A. J. Jorgenson, Paducah, Ky.; W. B. Blanton, Dubuque, Ia.; A. E. Boughner, St. Thomas, Ont.; F. E. McAlpine, Richmond, Ind.; W. L. Oakley, Cairo, Ill.; Chas. H. Reeves, Dubuque, Ia.; R. R. Baird, Logansport, Ind.; J. B. Mc Call, Itahca, N. Y.; W. M. Eggleston, Louisville; E. J. Peabody, Chicago.

The new constitution establishes the headquarters of the association at Chicago, and provides for one salaried officer, a Secretary and Treasurer, whose salary is fixed at $100 per month. All train dispatchers not under 21 years of age and who have at least one year's experience are eligible to membership. The aims of the association are the improvement of the service and the welfare of the members. An employment bureau is provided for, through which members out of work may secure situations.

A separate constitution for the organization of a mutual insurance was adopted. The following officers were elected :

President, A. A. Zion of Indianapolis.

Vice-President, E. A. Smith, Massachusetts.

Secretary and Treasurer, E. J. Peabody, Chicago.

Executive Committee, which includes the officers—C. L. Pasho, Bradford, Penn. ; H. H. Libbe, St. Joe, Mo. ; W. H. Graves, Wenona, Minn. ; W. W. Polk, Watervalley, Miss.

The Order of Railway Telegraphers.—The disagreement between the Order of Railway Telegraphers and the Michigan Central Railroad officials has been satisfactorily adjusted. The disruption was caused by a misunderstanding of the principles and the objects of the order.

The company issued an order that all who belonged to the organization should withdraw or resign from the employ of the company. Several resigned their positions, maintaining that so long as they were faithful to their duties as employees, and as long as no complaint could be made against them for neglect or violation of rules they should have the right to connect themselves with any benevolent society they saw fit, which was calculated to help them as men and as operators. The situation was laid before the general manager of the road, who its seems saw no objection to the order and directed that the policy of discharging them be pursued no further.

The officers of the Bay State Division, Order of Railway Telegraphers were installed at Boston, Mass., June 14th, by Mr. S. H. Brown. They are as follows : E. L. Dodge, chief telegrapher ; T. J. Fogarty, assistant chief telegrapher ; F. H. Collins, secretary and treasurer ; E. J. S. Miller, senior telegrapher ; D. F. Waite, junior telegrapher ; John Rourke, inside sentinel ; G. M. Burnop, ouside sentinel ; Johnson Macdonald, past chief telegrapher. Chief Telegrapher E. L. Dodge, was presented with an elegant silver-mounted ivory gavel, in behalf of the division.

The Boston *Herald* says : The Boston office is by no means a handsome one, but it is splendidly managed ; its record is as good as that of any office in the country. Even the main office in New York cannot make a better showing for the volume of business done. The Boston manager, Mr. Charles W. Henderson, and the district superintendent, Mr. Roche, are entitled to high credit for their efforts in perfecting the arrangements that have brought the Boston office up to such a pitch of efficiency. They have a large and able staff, and it is pretty safe to say that if anything goes wrong on the lines, which is very seldom the case, it is not their fault.

Syracuse Notes.—On June 16 a game of ball between nines selected from Syracuse and Utica telegraphers, was played in this city, the visitors being defeated by a score of 9 to 6. The game was exciting and for amateurs was well played, the players themselves being dazzled by their own prowess. The players were—Utica : McCauley ss, James 1 b, Peck 3 b, Klein p, McCraith lf, Lochlin c, Pond rf, Hyde cf, Young 2b. Syracuse : Meaney 3 b, Matthews p and ss, Out ss and p, Armstrong 1 b, Darling 2 b, Plant lf, Pulver cf, Neville rf, White c. Theo Dykeman of Utica, umpired the game. In the evening the Syracuse banqueted their guests at the Wells House ; the party, about fifty in number, gathered around several sumptuously laden tables and thoroughly enjoyed themselves for a couple of hours. W. A. Armstrong of this city acted as toast master. Among those who made happy responses to toasts, were J. E. Bierhardt, manager of the Western Union, and W. H. Parsons of the Postal, this city ; Frank E. Howell, ex-manager of the Western Union, Utica, and O. J. McCauley of the Utica *Observer*. Much credit is due M. A. Granniss, proprietor of the Wells House, who is an ex-telegrahper, for courtesies shown the banqueters. Among those present not already mentioned, were H. R. Penney, Herkimer, N. Y., S. H. Bierhardt, S. W. Dunning, L. S. Haas, Martin Dauer, F. H. Barth, J. L. Kearns, J. L. Cobb, Chas. E. Edwards, W. R. Jillson, A. W. Chase, W. F. Jones, S. H. Riker, E. T. Pardee, Chas. E. Chesebro, W. V. Brown and F. C. Gibbert of Syracuse and Geo. H. Pollock of New York.

Chicago Notes.—To give your readers an idea of what business was handled during the convention it is only necessary to state that to New York alone, fifty circuits were kept busy. Chicago has never before known such a scene and is not likely to again in many years. Manager Lloyd has demonstrated his ability as an executive of the first magnitude, and, no doubt, the company will recognize the able manner in which he has handled the large army of telegraphers under him. Frank Barnes has gone with the B. & O. R. R. as train dispatcher ; Fred Bunce to Omaha ; H. C. Durand to a commercial house ; W. J. Kahle, as a broker ; Messrs. Randall, Kyle, Woodring, Jacobs, to Postal ; McCutcheon, New York ; Tracy, Flemming and Drummond, West ; Wm. Kane has been appointed chief of the Southern division ; Mr. McCullough has been assigned to Northern routes ; Mr. John Savoy has been transferred to the Wheatstone as electrician. The Postal have the finest telegraph office ever opened in this city. Mr. Hi. Waters, manager on 'Change, has returned from Southern California greatly improved in health.

Jacksonville Notes.—Mr. G. H. Armstrong left last month for New York. Mr. C. F. Sweeney has returned from his wanderings in Mexico and Texas and is now at Punta Rassa. One of the best equipped railroads in the "Land of Flowers" is the Jacksonville, Tamba and Key West. In the dispatcher's office Mr. L. E. Spencer is chief dispatcher, assisted by Mr. G. V. Kennedy, both clever gentlemen. At Orange Park, W. P. Thompson ; Green Cove Springs, W. S. Banks ; Palatka passenger depot, Mr. A. L. Wisher ; Pomono, Edgar Booth ; Huntington, R. E. Brown ; Seville, A. L. Flagg ; Spring Garder, William Booth ; Deland Junction, W. C. B. Rawson ; Deland, J. W. Taylor ; Orange City Junction, Mr. S. C. Fuller ; Enterprise, Mr. G. F. Carlile ; Sanford Depot, Mr. H. H. Chappell ; Sandford City office, Mr. H. M. Killian is manager. This office is a busy one in winter. At Monroe Station, J. M. Booth ; Titusville, M. E. Gruber ; Palatka commercial office, Mr. A. E. Heston, manager, assisted by his wife.

Canadian Notes.—With the increase of business and consequent larger receipts, it was expected an improvement in pay day, with the Great Northwestern, would result, but the pay for the month of May did not make its appearance until June 20th. It is said the general manager was away on a fishing tour. This shows plainly how much the G. N. W. and its management has the good of its employees at heart. The inconvenience the operators are put to through this apparent neglect can well be imagined. No excuse whatever is made by the Company, not even an answer to petitions being deemed necessary. As the quarterly meeting of the board is approaching the operators should make another attempt and send their petitions direct to the board. The directors can hardly be aware of such a state of affairs.

The engagement is announced of Mr. Harvey James Lockrow, manager of the United Lines Telegraph office, Newport, R. I., to Miss Carrie Wyman Clarke.

The Western Union Telegraph Company has bought the plant of the Poughkeepsie District Telegraph Company.

LOUISVILLE, KY., NOTES.—Mr. M. J. Burke, the well-known ex-telegrapher, was married to Miss Abbie Virginia Lane of this city, June 6th. Mr. C. R. Mounce has arrived from Shreveport. Geo. F. Overton has resigned to become private secretary to Superintendent Porter of the Louisville Southern Railway, and Kentucky and Indiana Bridge Company. A bran new boy adorns the home of T. J. Leahy. Mr. Albert Loefler has been appointed manager at Bourban Stock Yards, *vice* M. H. Hedden, transferred to main office.

MEMPHIS NOTES.—A new fifty wire switch board has been put in this office. It is quite an improvement. We also have three new quadruplex sets in position. Mr. T. S. Ford is chief operator, days, with M. Paoli as wire chief, and Ben Howard as traffic chief. Operators Kline, Hawkins, Mayfield, Flannery, Senn, Chancellor, Wagner, McNavin, White, Ellis, Stevens and True, Misses Phillips and Davis. Nights, Mr. Wirt B. Harvey, chief, with operators Koch, McCarthy, Dillon, Creelman and Allison. Latest arrivals are Wagner and Stevens from the West, True from the South, McNavin, Savannah, White from Little Rock and Allison from Chattanooga. Phil. Burns is off on a vacation and Mr. Walker is down stairs on the cotton wire. Mr. Creelman has just returned after a brief sickness, as has also Mr. Koch.

BOSTON NOTES.—The excellent force of telegraphers in the employ of the Doran Wright Company of this city, have every reason to be well satisfied with the treatment of its employers. The force consists of Messrs. T. A. Clough, chief, H. C. White, C. T. Herrin, F. B. Gray, J. H. Shea, W. E. Stover, A. Marchessault, D. E. Harrington, J. F. Rankin, J. J. O'Leary and W. H. Peters. On Decoration Day, upon invitation of Mr. F. M. Libby, manager, the boys were treated to an excursion to Springfield, Mass., where they met the employees from the New York office of the company and played ball, defeating the New Yorkers 14 to 10. After the game a merry party of 55 sat down to a banquet, at which all testified to their enjoyment of the day's outing and appreciation of their employers' liberality.

ST. LOUIS NOTES.—Chief Operator Topliff, assisted by Mr. Spencer, during the recent democratic convention, did excellent work and kept the immense staff in good spirits. Seventy-five good operators from adjoining cities assisted in the work. The company, through General Superintendent Clowry has thanked the employes for the good work accomplished. Among those at the Convention Hall were Messrs. Kuttner, Dye, Wells, Smith, Beach, Springer, Evers, Irons, Bohannon, Ward, Richardson, Weiner, Hughes, Hunter and others.

HARRISBURG, PA., NOTES.—James H. Gingrich, who managed the Baltimore & Ohio Telegraph Company's office since the advent of that company in this city some three years ago, has resigned to accept a position as electrician and superintendent of the new electric street railway, which runs from the railroad station to Steelton, a distance of three miles, and to East Harrisburg, a distance of one mile. The Sprague system is used. A. R. Kiefer, division operator of the Middle Division, Pennsylvania Railroad, has been quite ill for the past two months and unable to be at his office. Chas. Gingrich, formerly of the B. & O., has secured a position in the main office of the Pennsylvania R. R. Company at this point. A United States weather signal station is to be established in Harrisburg. The office will be stationed on top of the new Post-office building and will be opened July 1st. Mr. Frank Ridgway has already arrived to take charge of the station. Mr. Harry R. McCartney, formerly of the Bankers and Merchant's, Carlisle, Pa., is now manager of the B. & O. here. Samuel A. Boyle, executive clerk in Governor Beaver's office, has resigned to accept the position of Third Assistant District Attorney of Philadelphia. He is a well-known telegrapher of Philadelphia.

SEATTLE, W. T., NOTES.—The Western Union force here consists of J. D. Snow, manager; Mrs. A. G. Loomis and Lawrence Conell, days and H. Hanson, split trick. At the Postal are Messrs. Wallis Crawford, manager, and Denny Fletcher, the old-time operator. At the Columbia and Puget Sound Ry. we find W. W. Sharpe dispatcher. This city will soon be one of the most thriving on the coast. Fine boating and fishing and a genial climate make it just the place for men who are seeking quite homes.

TACOMA, W. T., NOTES.—At the Western Union are Messrs. S. T. Armstrong, manager, with O. F. Haniger and J. L. Mc Donnell, operators In the Postal are Messrs. J. M. Bell, manager, and W. B. Armstrong, operator. This city, like Seattle, is fast coming to the front.

THE ELECTRICAL WORLD, in its issue of June 2, gave an excellent phototype picture, printed on highly calendered paper, of Mr. Edward Weston, the newly elected president of the American Institute of Electrical Engineers. The *Electrical World* proposes to continue the production of pictures of these prominent electricians.

J. H. Pendleton, president of the New York Electrical Society, is the inventor of a system of police signalling in which he claims surpassing economy, simplicity and efficiency.

Half a dozen operators in the big Western Union Telegraph building are actors during the winter and return to telegraphy when the season ends.

MR. THOS. A. EDISON has contributed to the June number of the *North American Review* an article on the perfected phonograph.

Mr. Marean, of the firm of Royce & Marean, Washington, D. C., was a recent New York visitor.

Mr. Alfred J. Gustin, ex-manager of the Southern Telegraph Company, died last week at Savannah, Ga.

John O'Connor died June 11th, 1888, at Middletown, N. Y., of softening of the brain.

Mr. F. McGloin, formerly of this city, has been appointed acting superintendent of the Automatic Fire Alarm and Extinguishing Company of Philadelphia.

Mr. C. R. Zacharias, formerly manager of the W. U. at Birmingham, Ala., will represent the same company at Asbury Park, N. J., during the season.

Mr. L. C. Madden, train dispatcher of the N. Y., N. H. and H. Ry., of New Haven Conn., was in town a few days since and gave us a pleasant call.

Our thanks are due Mr. E. W. Collins, of Cleveland, Ohio, for an excellent piece of music, his own composition—a memorial hymn, "Scatter the Flowers."

Mr. L. H. Butterfield of St. Paul, owing to ill health, has transferred to Chicago for the Associated Press.

Mr. W. M. Allison of the New York *Times* force, a well-known old-time operator, has been rusticating at Mifflntown, Pa.

Mr. F. D. Sweeten of Wilmington, Del., gave us a call last week.

Mr. E. W. Venable has been appointed manager of the Long Distance Telephone Co. at Saratoga, N. Y.

Mr. R. J. Mullen, late of Toronto, has accepted a position with the United Press at Chicago.

UNDERGROUND WIRES.—The Commissioner of Public Works has issued a number of permits to the Subway Construction Company, to open a number of streets for the construction of electric conduits. Several of the principal streets will be opened, including Broadway and Sixth avenue.

The committee of the National Light Association having in charge the bill to create a court of patent appeals, has received endorsement of the plan from the Patent Bar Association of Washington and letters of approval from the Justice of the Supreme Court.

Mr. C. J. Kintner has been appointed chairman of the examiners of employees for the Board of Electrical control.

After January 1st next, execution in the State of New York will be by electricity, according to a recent enactment.

NOTES FROM 195.—Great as was the amount of special sent from St. Louis during the democratic Convention, it was small compared with the deluge from Chicago during the protracted session of the republican delegates. Thirty circuits exclusive of those monopolized by the Wheatstone, which ground out the news with great rapidity, were in use almost nightly. Bulletins were received promptly and as quickly dispatched to those for whom they were intended. This service, which was under the personal supervision of that well-known telegrapher Mr. W. A. Van Orden, who was summoned from the draughtsman's department for the especial purpose of keeping it straight, was all that could be desired. Between twenty-five and thirty of the regular night force were ordered on every morning to assist the day men and the work performed by all was excellent. The loop service was as perfect as was possible to make it. The afternoon papers had their wants promptly attended to. The interests of the morning papers were well taken care of by that able electrician George W. Gardanier, who at ten o'clock nightly turned over to Paul Sheehan the task of seeing that they did not flag the balance of the night. Miss Rose Flynn, who works the Yonkers wire, was the recipient a couple of weeks ago of a handsome photograph of the entire force of Albany office. That she is justly proud of it is apparent from the delightful way she exhibits it to her many friends. A few days ago Ed Blakeney, who, since the transfer of Martin Durivan to Long Branch as chief operator, has succeeded that gentleman on the Western Ways, felt the pangs of hunger gnawing at his vitals and expressed a desire for a dinner relief. It was slow in coming, and Miss Flynn, who had witnessed Ed's growing impatience, kindly offered to look after business during his absence. A few minutes later the rosy color of her complexion was heightened several shades by Mr. Brennan's announcement that she would please act as traffic chief while Mr. Blakeney was at dinner. She did the work well, but in future the dear girl's jokes will be hurled at some one else. By the crossing of two electric light wires under the platform of the Central distribution desk early last Sunday morning, what might have been a serious fire was averted by the effective manner in which Mr. Tobin handled the new fire extinguisher. It was the first time one had been used. Jakey Tuck has gone to long Branch for the summer. The hours of Al Lauer, assistant traffic chief on the Chicago, have been changed from 7.30 to 8. The spirits of the operators on 20 West have recovered their buoyancy since Miss Emma Garthwaite's assignment to the wire. Mr. and Mrs. Becker have gone to Saratoga for the summer. William Leith is working in the Press News Bureau. George E. Baker, Western wire chief, has lost his father. He has our sincere sympathy in his bereavement. George Ernsthowser, one of the night check boys, has accepted a position as operator at Ramseys on the New York, Lake Erie and Western Railroad. Mr. Lounsbury, who works the Washington quad., now comes on at 8 instead of 7.30 A. M. Miss C. H. Macy has transferred to Brunswick, Ga., for this company. Mr. S. B. Lambdin took a little trip to Niagara Falls of two or three days, crossing over to Canada and viewing the falls in all their phases, says it is indescribably grand and far exceeds expectation.

J. W. Eills, operator at the *Telegram* office, resigned June 1st, on account of ill health.

W. R. Hendrick, late operator at the *Evening Sun* office, has been given a place on the staff on that paper, and R. G. Morris has been appointed in his stead.

Miss C. H. Taylor of the W. U., San Antonio, Texas, is at Boyce, La., on a vacation. Mr. Fox is subbing for Miss Taylor.

Lew Lohne, a Western Union lineman, was sunstruck on June 22d, while repairing wires in New York City, from the effects of which he died almost instantly.

Oscar M. Gibbs, formerly of Montreal, is receiving press report at St. Jose, Cala.

Mr. B. F. Fithian has resigned his position at 120 Broadway and is subbing at 16 Broad street.

Captain J. R. Dennis of this city is rusticating in the mountains with his family during the heated term.

Mr. Fred W. Cushing, a well-known Chicago electrician, has entered the employ of Elisha Gray, the inventor.

BORN—To Mr. and Mrs. C. H. Cottrell, of New York, on June 27th, an eleven-pound son. The boy will be named "Leslie Phillips Cottrell."

Mr. W. A. Sheppard of the W. U., Anniston, Ala., was highly complimented for his typewriter work in the local paper during the convention rushes.

Mr. E. A. Leslie, the well-known electrician, when only sixteen years of age saw some good fighting in Alabama during the war. His name adorns the military records. He was a drummer boy in the 46th Illinois regiment.

Mr. F. D. Sweeten, a well-known telegrapher, for some years of Wilmington, Del., has entered the electrical business at Wilmington. We wish him every success.

BORN—To Mr. and Mrs. B. F. Fithian of New York City, on June 16th, a son.

WANTED—Two competent male operators to sub at C. P. R. commercial office, Montreal, during the month of August; salary $40. Apply "Vacation" P. O. Box 1007, Montreal.

William B. Smith, late of the Mexican Cable Company, has returned to the United States from England, where he has been for some time on a visit. He has been appointed to the Wheatstone department in the Western Union office at Chicago.

The many friends of Mr. James Newell, formerly chief operator for the Western Union at New Orleans, La., will be glad to learn that he is now prospering at Little Falls, N. Y. Mr. Newell is an old army operator, having been with the Army of the Potomac during its campaign.

Mr. E. A. Quick, the well-known and prominent New Yorker, has opened a broker office at Paterson, N. J. His numerous friends scattered throughout the country wish him every success. Mr. Quick's good qualities and his sterling integrity will be ample recommendation to the citizens of Paterson.

Mr. John W. McLaren has been appointed general superintendent of the Empire and Bay State Telegraph Company, headquarters at 34 Broadway. Under his supervision the company will in a short time have many Boston and New York circuits in shape to lease to brokers and others. The company will eventually branch out into a general telegraph business. The appointment of Mr. McLaren is an excellent one and reflects creditably on the judgment of the young corporation.

TRANSFERS.—H. C. Allison, Chattanooga to Memphis, Tenn.; J. M. Ryan, Omaha, Neb., to St. Louis, Mo.; J. D. Ragland, Nashville to Chattanooga, Tenn.; J. Weir and J. Tuck, New York to Long Branch, N. J.; Miss H. B. Donohue and Mr. E. A. Kilbourne, Virginia City to Reno, Nev.; W. Martin, Bird's Hill, Man., to Almonte, Ont.; Will Rogers, Kansas City to Atchison, Kan.; J. H. Schwerzgen, Chicago to Fort Wayne, Ind.; Williard E. Fohl, Lancaster, Pa., to Cleveland, O.; C. B. Roden, Waynesboro, Va., to Sheffield, Ala.; Miss Macie Jones, Durham, N. C., to Decatur, Ala.; Mack L. Lindley, Roans Prairie, Tex., to Bajan, Mexico

PERSONAL.—Mr. A. W. Childs, general manager of the Brattleboro Telephone Exchange, is away on a few days' vacation in Canada.

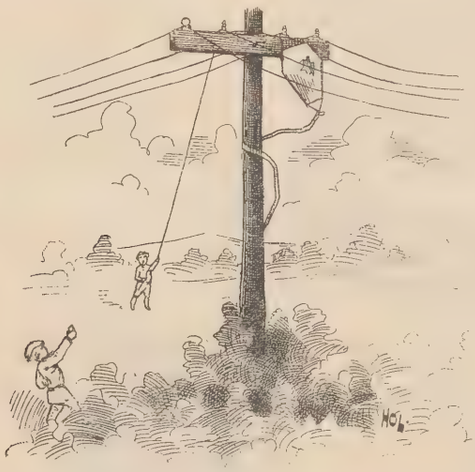
SOME TROUBLES OF TELEGRAPH LINES THAT ARE NOT ELECTRICAL.

BY WM. MAVER, JR.

There has been some doubt in my mind whether the following compilation of troubles, besetments, or whatever they may be called, of telegraph lines in various parts of the world, might not more appropriately be headed "Some Reasons why Telegraph Shareholders are Unhappy." For while the troubles that beset the poles, wires and insulators tend to diminish the terms of usefulness of those important elements of telegraph equipment, besides consigning them to a more or less early oblivion, it is, after all, the shareholders that suffer most, in diminished dividends.

In almost if not every country where the telegraph has appeared, the inhabitants, in the shape of man or beast, bird or insect, have either advertently or inadvertently been the cause of innumerable delays to business and serious damage or destruction to the poles, wires or insulators, and a recital of some of the different ways in which they have been so will hardly fail to be interesting.

Without comment I will just refer to such everyday causes of injury and annoyance as blizzards, sleetstorms, floods, railroad wrecks, etc., and pass on to causes some of which are of a less accidental nature.

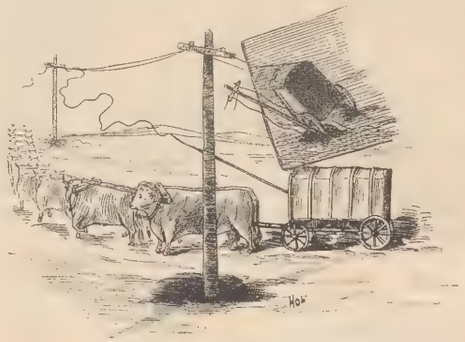


We are all familiar with the spectacle of the small boy throwing stones or other missiles at the insulators. The idea that a piece of round or partly round glass should be placed on a plain wooden pole for any other reason than that he might throw stones at it is too absurd for his consideration. Of course there are some small boys who know better, and they do not throw stones at the insulators—until they are well assured that no one is looking.

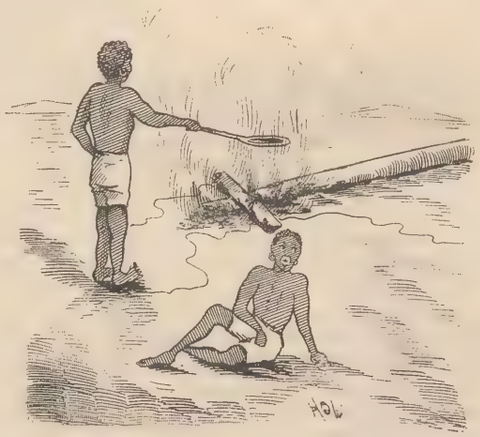
The glass insulator is also, in many instances, made the target of the unsuccessful sportsman, who, having failed to bring down legitimate game, vents his spleen on the unhappy insulator. No wonder that, between the small boy and the hapless sportsman, added to the breakages due to wear and tear, the principal telegraph and telephone companies of this country replace, it is estimated, about two million insulators per annum. At about five cents per insulator, the cost is easily figured.

The small boy again with his kite tails, which gravitate as naturally to the telegraph wires as water to its level, is the innocent source of trouble and expense, to an extent of which he little dreams, to the telegraph companies. In the large cities especially is this the case, and it is several men's work, during the kiting season, to patrol the circuits, burning off remnant tails and removing wire crosses which have been made by the frantic tugging of the boy to regain his ensnared kite.

Kite tails are not the only "innocent" cause of wire crosses, but to find another cause we travel to South Africa, leaving civilization behind. There, in many cases, the telegraph line crosses the wagon roads that traverse the grass "veldts" or plains of that country. The wagons are drawn by bullocks to the number of sixteen or twenty, two abreast, and a whip to reach the foremost pair of bullocks must be of no meagre dimensions As the wagon-driving is done chiefly at night, presumably to avoid the intense heat of the day, the wires at such crossings are invisible to the driver and the leash of the whip frequently becomes curled around the wires and so brings them together.



This is not the only damage that the transport wagons occasion to the telegraph lines in the same part of that country, for, also owing to the darkness at the "crossings," the wagons are at times driven against the poles, often breaking them. To avoid accidents of this kind as far as possible, and in the hope of inducing the drivers to give the poles a wide berth, the telegraph people dig large ditches around the poles, but even this does not entirely prevent collisions.



Another "tribulation" of the South African telegraph companies is that, owing to the scarcity of timber on the plains, the teamsters avail of the presence of the wooden poles to use them for their camp fires. This is a sufficient source of annoyance to warrant telegraph engineers recommending that the telegraph poles be made of iron or that a route away from the wagon roads be chosen.

In the Kaffir country the telegraph wires have been of considerable value to the black man in furnishing him a source of supply from which to obtain "slugs" for his rifles when lead or pebbles ran short, and it is not on record that he takes the trouble to provide continuity of the line by filling in the gap, even with a shoe-string, as did a considerate Arkansan who had helped himself to a small portion of a copper telegraph wire passing through his State.

A very singular mania at one time had, and may yet have to a diminished extent, possession of a number of the inhab-

itants of Persia. In that country the telegraph poles are iron tubes. The native sportsmen found that a rifle-ball would pass through the iron shell, leaving a hole behind it, as might be expected, and the fact must have been a source of much amusement to the sportsmen, for the "bulleting" of the poles became so extensive that the authorities could only repress it by the most stringent measures. The bullet would go clean through the near side of the tube, but would only succeed in tearing off a large strip of the metal on the opposite side. This repeated twice or thrice ruined the pole. On one occasion sixty bullet holes were found in one pole, and in a section of about seventeen hundred poles three hundred and ninety-two had been bulleted and destroyed thereby within five years. The native Mohommedans of that country believing that this invention of the European infidel was a means whereby he held communication with the evil one, thought it no wrong to utilize the wooden poles which were first employed, as firewood, and the iron wire as bits for their camels and donkeys. This familiarity the Government also repressed with the strong arm of the law. In addition to these simple amusements the pilgrims to Mecca found great diversion in shooting at the insulators of the telegraph wire, greatly to the detriment of the insulation of the circuits.

(*To be continued.*)

OLD-TIME TELEGRAPHERS.

"There are plenty of good telegraphers being turned out now, just as there have always been," said the operator; "but the introduction of multiplex systems has had a bad effect on the business, in regard to the individual speed attainable, and the constant reduction in salaries has removed much of the inducement to become thoroughly proficient. Still, if a boy has it in him—for you must know that good telegraphers are like poets, they are born, not made—he can become as expert as in the old times."

"Tell me about some of these old-time stars."

"Well, of course the kids won't believe it, but the fact is that nearly all of them were good ones back in '68. I suppose, though, that the big four, from a sender's standpoint, at least, were George Eitemiller, of Pittsburg, P. V. DeGraw, of Washington, Bert Ayres, of Cincinnati, and Billy Kettles, of Boston. There was very little difference between them in point of speed, although I always did think that Eitemiller—the boy George, we used to call him—could send just a little faster than the other three. He was a great receiver, too, and so were the others for that matter."

"I suppose, though, that there were some phenomenal receivers, just as there were exceptionally fast senders?"

"Yes; there was Walter P. Phillips, for instance. He won the gold penholder that Professor Morse offered as a prize for skill in receiving. I forget what the exact figures were, but it was something like forty-six words a minute for over an hour without a 'break.' P. H. Burns was the sender, and the performance has never been equaled to this day—at least, not as a matter of record. John W. Moreland, who died two years since in San Francisco, was another phenomenal receiver, but of different style from Phillips. The latter copied close up, as an operator would express it, but Moreland's specialty was copying behind. It was mere pastime for him to keep thirty-five or forty words behind on press matter—that is, he was keeping that number of words in his head all the time, while the sender was hammering away as fast as he knew how. He was always correct too, no matter how far he got behind; it was a natural gift in his case."

"Are any one of those you have mentioned in Chicago now?"

"No. Eitemiller is a chief operator in Pittsburg; DeGraw is manager for The United Press at Washington; Ayres is with the same association in New York City; Kettles, I think, is still in Boston; Phillips is General Manager of The United Press, with headquarters at New York, and Moreland, as I said, is dead. You must not understand, however, that there are no good old-time operators in Chicago, for the woods are full of them."—*Chicago Herald.*

ELECTRICAL PATENTS GRANTED JUNE 12, 1888.

384,289 Automatic switch for secondary batteries; John S. Sellon, Hatton Gardens, County of Middlesex, England, assignor to the Electrical Accumulator Company, of New York.

384,350 Combined telegraph key and sounder; John Doggett, Plain City, Ohio.

384,472 Electric winding attachment for clocks; Andrew J. Reams, Augusta, Kans.

384, 326 Automatic pole changer; Edward J. Mallett, New York, N. Y.

384, 384 Metallic crest tile lightning rod; Clark B. Nelson, Crawfordsville, Ind.

384,404 Machine for covering or insulating wire; Joseph D. Thomas, South Framingham, Mass.

384,447 Regulating commutator for secondary batteries; Edmond Julien, Brussels, Belgium.

384,455 Printing telegraph receiver; Henry Mahnken, New York, N. Y.

384,472 Electric winding attachment for clocks; Andrew J. Reams, Augusta, Kans.

384,476 Police electric signal system; Charles E. Scribner, Chicago, Ill.

Mr. Charles P. Bruch, the efficient secretary of the Telegraphers' Mutual Benefit Association, has been appointed assistant to General Manager Gilliland of the Edison Phonograph Co. Mr. E. T. Gilliland is to be congratulated on securing the services of so excellent and enterprising a gentleman. Mr. Bruch since he became identified with the T. M. B. A. has made myriads of friends, who unite in wishing him success in his new field of labor. Thomas E. Fleming, formerly with E. A. Leslie as his chief clerk, and latterly with the B. & O. Telegraph Co. as manager's clerk, is clerk for Secretary Bruch of the T. M. B. A.

The Board of Electrical Control has elected as its electrical expert Mr. Schuyler S. Wheeler, who stood at the head of the civil service list both in the written and in the oral examination. It has also elected inspectors, and taken other steps to render its organization complete and efficient. It proposes to have all lighting plants in the city examined and approved by July 1, as well as all conductors by July 15.

At Ansonia, Conn., escaping electricity from the electric street railway has charged the Naugatuck river and it is proposed by the shrewd Yankees of this money-making town, to lease the banks of the river and establish bathing houses, that people may take a pleasant, invigorating electric bath at a small cost.

The Direct United States Cable.—It is reported that telegraphic communication on this cable is now entirely interrupted. Presumably the *Scotia*, in her endeavor to pick the cable up, or in grappling operations, has broken the cable.

Dr. Norvin Green, while traveling by train lately, was called upon to resuscitate a passenger taken suddenly ill, and showed that he had not lost any of the professional skill.

Professor A. E. Dolbear is to speak before the American Institute of Instruction at Newport on July 9 on "Recent Advances in Electrical Science."

Neither the democratic nor the republican platform has anything to say in reference to postal telegraphy.

POSTAL NOTES.—During the convention business here was booming and both the day and night forces were kept very busy. As usual at this season of the year a number of new men have been added to the extra force. Among those most prominent we notice W. A. Kenna of Boston, T. J. Parker and W. H. Conn of Philadelphia, Elmer Betts of Jersey City, Cornelius Dwyer of Chicago, J. M. Fair of San Francisco, A. E. Marr of Carbondale, Pa., and T. J. Burke, Messrs. W. E. Oddie, J. J. Carroll and E. Morris are on regular. P. J. Lesser, F. N. Johnson, T. J. Crary and Mr. Kennedy have resigned. Under Mr. Henning's charge the C. N. D. has grown so rapidly that George Wright and F. A. Ganung have been detailed to assist him. Frank Cusick has been transferred from the operating room to the battery to assist Messrs. J. Flood and C. Richter in taking charge of the new dynamos which are to replace several hundred cells of battery. P. F. Larkins has taken a vacation extending over the Fourth of July. Assistant Route Clerk Grant has resigned and his position is now filled by Charles Augustin. It was not until the recent warm weather that the full value of the large fans were appreciated. S. D. Sprigg, manager, F. J. Connor, day chief, and William Sullivan, night chief, of the Baltimore Postal office paid us a visit this week.

ST. JOHN, N. B., NOTES.—The following is the personnel of St. John, N. B., office: T. M. Robinson, manager; B. S. Black, day chief; Geo. S. Dodge, night chief; they have been in the W. U. employ in this city about thirty, twenty-five and twenty years respectively; C. A. Shamper, J. M. Barnes, Geo. M. Robertson, Miss M. Thomas, F. M. Bailey, W. J. Ryan, R. P. Peake, W. S. Rainnie, S. A. Morrison, Percy Robinson, E. Miloy, Miss A. Thomas and Miss H. Rogerson. Miss Rogerson is on a two months' vacation, her place being filled by Mr. Croskill of Halifax. Our efficient manager has been seriously ill since January, having had an attack of paralysis. Mr. Barnes distinguished himself recently by winning a well contested one mile bicycle race at the Cricket and Athletic Club grounds. It is rumored that several changes are to take place soon, but have not been announced yet. There are four female and two or three male students in the office at present. Mr. R. T. Clinch is superintendent of this district, which includes New Brunswick, Nova Scotia and Cape Breton. He has the welfare and comfort of his employes at heart. The office has been repainted and varnished, the ceiling sheathed and a couple of ventilators put in, making this the neatest and healthiest office in the maritime provinces. Mr. Barry Betts presides over the receiving department and Mr. W. S. Snyder, formerly manager of the Dominion Telegraph Co.'s office here, over the delivery department. They discharge their duties in the most gentlemanly manner and have made host of friends among the public.

PENNSYLNANIA RY. NOTES.—Monotony, thy name is Pennsylvania Railroad! We see but few new faces. Men looking for advancement do not strike here; at least we do not see them. George Knowles, at Harsinus Cove, Jersey City, takes three months' leave of absence; G. V. Phillips fills his place. F. Sorter has been transferred to the Jersey City main office, night trick. W. H. Clark, from Elizabeth, days, has been transferred to floatmaster's office at Jersey City, days. Jim Dunn has been transferred to Elizabeth, days. The other night during the heavy shower lightning struck and burned out Pennypack office, and during the shower of June 8th lightning knocked the steps off of Waverly Tower and frightened Mr. J. Bolles into being quiet for once in his life. The same night nearly all telegraph service was rendered useless on the meadows between Newark and Jersey City, all the switchboards being burned out. B. B. Titus, with John Garretson and J. Nevins, linemen, is at Jersey City. W. Higgins and E. C. Chamberlain look after the wires from Trenton. The same management continues in "J" office, Jersey City, and also in the dispatchers' office.

The Windsor Theatre in this city was crowded on Monday night with an enthusiastic and thoroughly appreciative audience to witness the opening performance of the new American farce-comedy entitled "Dollars and Hearts," by Mr. H. A. Du Souchet, the well-known telegrapher. The operators of the city attended in large numbers on the occasion, and manifested by their presence a hearty and lively recognition of the author's first dramatic effort. The piece is divided into three acts, the characters being especially well drawn, and the entire programme proved sufficiently attractive and amusing. The play is billed for the whole week, and we belive that "Dollars and Hearts" will be a big success.

The *Evening World* of the 26th inst. contained a lengthy and very interesting article by Tom O'Reilly on the subject of organization among telegraphers. It seems that the good work is being vigorously pushed among the commercial and railroad operators. The article has created some stir among the members of the fraternity here, and we regret our inability, through want of space, to republish it in full for those outside the city. There never has been greater need for unity than at the present moment. Operators everywhere should organize at once.

THE QUADRUPLEX, by William Maver, Jr., and Minor M. Davis, with chapters on the dynamo-electric machine in relation to the Quadruplex, the practical working of the Quadruplex, Telegraph Repeaters and the Wheatstone Automatic Telegraph. By William Maver, Jr. Cloth 126 pages, 63 illustrations. Price, $1.50. Address J. B. Taltavall, 5 Dey street, New York.

During the Republican convention the Western Union sent 6,500,000 words of special; United lines, 2,500,000. This is three times the business done at St. Louis during the Democratic convention and twice the amount of business ever done before.

The Western Union Telegraph Company is not a New England Telephone subscriber and can only be called for the purpose of sending telegrams.

The Brattleboro Exchange has recently placed in their office a new one hundred line switch board, made by the Western Electric Company.

A German paper says that a company has been formed to manufacture watches to be run by electricity instead of a spring.

The railway superintendents of telegraph will meet in annual convention in New York City on July 11.

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Gordon's Electricity and Magnetism. 2 vols.	"	10 00
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Gray's Absolute Measurements in Electricit and Magnetism	"	1 00
Hammond's Electric Light in Our Homes	"	1 25
Harris's Rudimentary Electricity	Boards	60
Harris's Rudimentary Magnetism	"	1 80
Harris's Rudimentary Galvanism	"	60
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Hospitalier's Modern Applications of Electricity. 2 vols.	"	8 00
Jenkin's Electricity and Magnetism	Cloth	1 50
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Loring's Handbook of the Telegraph.	B'rds, 50c. Cloth, 75c	M'roc $1 00
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DEVOTED TO TELEGRAPHY, TELEPHONY, ELECTRIC LIGHTING AND ALL PHASES OF ELECTRICAL DEVELOPMENT.

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No. 5 Dey St., New York.

NEW YORK, JULY 16, 1888.

In this issue will be found an excellent article descriptive of a new acoustic telephone which has recently been placed upon the market, the invention of Mr. George F. Shaver. Mr. Shaver's latest invention is the most perfect instrument of the kind ever placed before the people, and having spent years in its production he is deserving of the unstinted credit given him and the hearty reception with which the instrument has met at the hands of the public so far in its brief career.

Our esteemed contemporary, *The Western Electrician*, has just entered its third year of successful journalism. It has made some excellent promises for the coming year, which we have no doubt, will be faithfully carried out to the letter. Editor Kreidler is a wide-awake and enterprising journalist and fully appreciates the importance of an electrical journal published in the West. *The Western Electrician* has been liberally supported in the past, and its recent promises are the best indications that it proposes to stand by its friends in the future. It has our congratulations.

The order of Railway Telegraphers has just held its third annual convention. The order is a remarkably vigorous one and its popularity has never been equalled in this country before. The membership is now fully 10,000. There is upward of $3,000 in the treasury. The next meeting will be held at Cleveland, Ohio.

The last quarterly report of the Gold and Stock Life Insurance Association makes an excellent exhibit. The continued success of the institution is noteworthy. The membership has increased to 504 and the amount in the treasury nearly reaches the sum of $2,000. When it is remembered that the dues are but 50 cents per month, which pays for insurance to the amount of $600, in twelve $60 monthly installments, the figures carry with them much incouragement to the telegraphic craft at large. The next move should be to throw open the doors to those outside of New York City who desire to apply for membership. Such a move, we understand, is now under consideration. The officers of this organization are to be congratulated upon the prosperity of the association, which is, of course, very largely attributable to their unceasing labor in its behalf.

Two English electricians have tried the Delany protective device which was described in these columns on June 1. The results were not as satisfactory as would be necessary to proclaim the safeguard reliable from their standpoint. It appears, however, that about one-third of the current was shunted around, while two-thirds passed through the body. It seems to us, therefore, that a sufficient amount of electricity of dangerous currents would be shunted to prevent fatal shocks.

The telegraphic statistics which reach us from Chicago relative to the amount of press matter handled during the late National Republican Convention, convinces the most skeptical that the telegraphic facilities of the country are keeping pace with the progress of the times. The telegraph companies handled with surprising promptness all the matter handed into their offices, and so far as heard from not one complaint of delay has been rendered. The system of direct wires, now so general, has reduced space and time to a minimum.

The annual meeting of the Philadelphia, Reading & Pottsville Telegraph Company was held at Reading on June 26th. The following officers were elected for the ensuing year: President, Austin Corbin; Secretary, Howard Hancock; Treasurer, John Welsh; Directors, George DeB. Keim, S. A. Caldwell, A A. McLeod and A. J. Antello.

The electricity is generated from the armature to the field, says the *Electrical Engineer*. The current is produced by the velocity of the armature through the magnetic field that produces the current. The strength of the current is twenty amperes (amperes meaning quality), seventeen volts (volts indicating the force).

Mr. Hamilton, the London agent of the Edison Phonograph Co., has forwarded phonograms of the choir of 4,000 voices at the Handel festival recently at the Crystal Palace. Phonograms of the leading soloists were also included in the mails for Mr. Edison.

ELECTRIC RAILWAY FOR JAPAN.—The Mikado has commissioned an engineer to visit the States, to gain information with the intention of introducing electric railways into Japan.

The National Electric Light Association will meet on August 29th, and the National Telephone Exchange on September 3d, both in New York City.

It is becoming more apparent every day that electricity is destined to displace horse-power for street railway purposes.

In the United States it is said the telephone is used 595 times, the telegraph 136 times, in a minute.

Dynamo Tenders' Hand-Book: BY F. B. BADT, Chicago. 100 pages, 70 illustrations, flexible cloth. Price $1.00. Address J. B. Taltavall, 5 Dey street, New York. Mr. Badt, in the preface, says he has striven to lay down, as the results of an extended experience, general rules for the care and operation of electric light installations, and discarding entirely the use of technical phraseology and scientific terms and formulæ, has endeavored to confine his use of words to those very plain, simple and elementary in character.

Such a book is of the utmost importance, inasmuch as the rapid growth of the electrical industry has called into the field people lacking electrical knowledge of any kind. Therefore the aim of the author to furnish a book which will be understood by even novices at the business, is highly commendable, and at the same time the book is also intended for those more fortunately favored with a thorough technical education.

TYPE-WRITING **250,000** WORDS

Mr. Addison C. Thomas, superintendent of the Western Associated Press, Chicago, Ill., recently made public the important part played by the Remington type-writer during the recent Republican convention. Our readers need hardly be informed of the importance of legible and speedy copy on occasions of National conventions.

In the preparation of the copy of the proceedings of the late convention the Remington Type-writer scored its greatest victory.

Mr. Thomas stated that upward of a quarter of a million words of news matter relating to the convention alone, had been sent over the wires during the week ; in addition to this, of course, there was the regular news report from end to end of the world duly received and cared for in the Chicago office.

The tactics of the expert stenographers formed one of the not least interesting features of the convention. Directly a delegate spoke the lightning shorthand man was upon him jotting down his words as they fell from his lips.

Ten of these expert stenographers, Mr. Thomas said, worked in relays. When one had secured his quota he hastened away to an expert lady typewriter, to whom he dictated his "copy," and sped back to take his place among the waiting shorthand men.

Each young lady operator worked off her share of copy on a Remington typewriter, on which reliable instrument she was able to print off fourteen duplicates simultaneously ; six of these were actually taken on *white paper*, the residue being on yellow manifold sheets.

In response to a question as to whether this was not a pretty severe test to put any typewriter to, Mr. Thomas admitted that it was ; but he added the assertion that the Associated Press had never experienced any trouble in making the Remington typewriter accomplish almost anything required of it. Six Remington typewriters were used by the Association at the convention, and the fourteen copies of matter turned out by each of them was simply perfection, and no interruptions whatever occurred through the giving out or stiffening of any portion of the machine.

Mr. Thomas further volunteered the statement that the Associated Press had the Remington typewriters on precisely the same kind of work all through the National Democratic convention at St. Louis, the Association being so highly satisfied with the work performed by them in that instance that there was no hesitation in employing them on this occasion.

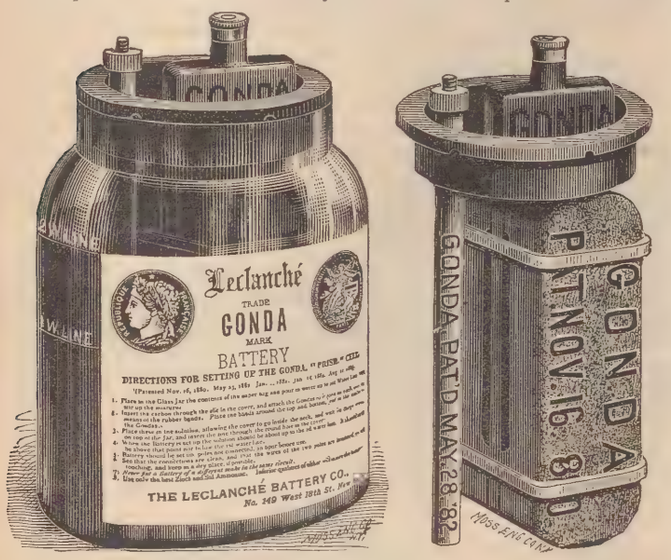
A DICTIONARY OF ELECTRICITY

A Dictionary of Electricity, or the Electrician's Handbook of Reference, including recent electrical and technical terms and descriptions of late inventions in electricity and magnetism, with numerous illustrations of telegraphic instruments, telephones, electric clocks, bells, dynamos, batteries, lamps, etc., and their appliances. This invaluable book is a necessity to all successful electricians, as it furnishes the correct definitions to the multifarious technical terms, and places every person in possession of the very information which is needed daily in all departments of electricity. The price of the book is $1.50 and will be mailed postage prepaid upon application to J. B. Taltavall, 5 Dey street, New York.

Since the appointment of Mr. Schuyler S. Wheeler as electrical engineer to the Board of Electrical Control, it is apparent that the dead wires in New York City are receiving considerable attention, and it is more than likely that steps will at once be taken to remove these dangerous circuits from overhead. The board, previous to the appointment of Mr. Wheeler, could not understand how it was possible for "dead" wires to convey electricity. Mr. Wheeler evidently has made good use of his time since June 16, when his appointment took effect.

THE LECLANCHE BATTERY.

We illustrate herewith the improved form of the Leclanche Prism Battery. This battery is one of the best open circuit batteries on the market. In the improved form the cover is in the shape of a cup, with a flange which rests upon the top rim of the jar and is provided on its under side with grooves. The electrodes pass through suitable openings in the bottom of the cup. The electrodes fit the openings through which they pass as closely as practicable and there is so little space left around them that it is scarcely possible for the connections to be affected by the creeping of salts or by the vapors from the interior of the jar. These vapors find their readiest avenues of escape through the grooves under the flange of the cover and are thrown off at a distance from the connections. If, however, it is desired, in cases where the battery is to be left for long periods without attention, to make assurance doubly sure, a little melted paraffin wax poured into the cup will effectually accomplish it and the poles will be hermetically sealed in the cup.



The peculiar shape of the cover makes it very strong and not liable to break. It also prevents the possibility of the zinc being thrown against the other electrode at the bottom of the jar.

Other advantages of the battery are that it does not freeze, contains no acid, emits no odor and requires but very little attention. It will last without renewal from six months to several years, according to its use.

An electric launch, constructed as to its motive arrangement on practically the same plan as that of the *Volta*, which successfully crossed the English Channel some two years ago, was experimented with in New York Harbor a few days since and aroused a good deal of curiosity among those who saw the little craft going through the waters, apparently without means of propulsion. The trials were considered very successful. In the near future there will be a "rush" for the use of electricity in this way and once its use is commenced it will make such rapid strides that the novelty feature will quickly cease to exist. But it will not be the storage system that will accomplish this. The "machine" will have to be complete in itself and ready for use anywhere and at all times.—*Progressive Age.*

The approximate length of the new Metropolitan Telephone switchboard which is undoubtedly the largest in the world—is about 300 feet. So expensive are the polished hard woods and electric appliances employed in its construction that the total cost will be about $350,000. It is expected that about September 1 it will be in readiness to receive the wires.

ELECTRICAL PATENTS GRANTED JUNE 19, 1888.

384,644. Multiple switchboard testing apparatus; Charles E. Scribner, Chicago, Ill., assignor to the Western Electric Company, same place.

384,676. Automatic electric gas cut-out for railroad cars; Frederick C. Brower, Syracuse, N. Y.

384,685. Electric railway; Stephen D. Field, Yonkers, N. Y.

384,775. Electro-magnetic parcel carrier; Morris C. Mengis, New York, N. Y.

384,796. Electric gas-lighting device and gas cock; William Tag and Sanford C. Smith, Philadelphia, Pa.

384,811. Apparatus for operating automatic block signals; Thomas D. Williams, Allegheny City, and John S. Lucock, Bellevue, assignors of three-fifths to James W. Clark, Geo. M. Eitemiller and Geo. Morris, all of Allegheny county, Pa.

384,816. Commutator for dynamo electric machines.

384,830. Railway signaling; Thomas A. Edison, Llewellyn Park, N. J., and Ezra T. Gilliland, New York, N. Y.

384,856. Electro-magnetic time lock; Charles J. Kintner, New York, N. Y.

385,001. Rheostat; James W. Packard New York, N. Y.

385,020. Electric light system; Bernard E. Sunny, Chicago, Ill.

385,022. Apparatus for electric welding; Elihu Thomson, Lynn, Mass.

385,023. Electric switch; Patrick J. Tracy, Racine, Wis.

385,043. Electric alarm compass; Henry A. Chase, Stoneham, Mass.

385,054 and 385,055. Electric railway; Rudolph M. Hunter, Philadelphia, Pa.

385,173. System of electrical distribution; Thomas A. Edison, Llewellyn Park, N. J.

385,214. Telegraph relay. 385,215. Electrical connector; Frederick Stitzel and Charles Weinedel, Louisville, Ky.

THE CABLE WAR ENDED.

At last the cable war is over and everybody concerned is, of course, happy. Few persons, if any, believed when the contest began between the Mackay-Bennett Company and the companies comprising the pool, that it would last more than six months, yet for more than two years the battle has been waged, undoubtedly to the pecuniary loss of both contestants. In the absence of any evidence to the contrary, it is fair to infer that the Commercial company is the vanquished party, though we doubt whether the anxiety of that corporation to terminate hostilities has for many months past been any greater than that of its opponents. During more than half of the time the war was in progress, the new company maintained its rate at 40 cents, and apparently had all the business it could handle despite the fact that its rivals were carrying business at a 12½ cent rate. This condition of affairs changed, however, and it became evident that the public were deserting the company charging the higher rate for that carrying business at the lower figure, from the fact that the former suddenly reduced its tariff to meet the rate of the pool companies. The reduction was regarded by everybody acquainted with the cost of transmission, maintenance, etc., as the beginning of the end. It was conclusively demonstrated in the memorable war between the Anglo-American and the Direct companies in 1880, that a 12½ cent cable rate could not only not be maintained with profit, but that it entailed a percentage of loss sufficient to make the annual deficit appalling, and with this knowledge gained from experience, the former company went into the contest just ended. From the moment that the Commercial company reduced its rate to that of its opponents, the only question involved in the fight was the one of ability to lose money and survive its loss, since both sides were placed in a position where the more business they did the more money they lost, and in such a contest the younger company was clearly overmatched.

Possibly the rates may be again put at 40 cents, but we are not prepared to believe that so great an increase would be wise. The cable-using public, and it is a large and rapidly growing one, would be entirely satisfied with a 25 cent rate, and the companies certainly ought to be content with doubling their tolls, for the present at least. Whatever may be the rate finally agreed upon, we have confidence that another cable war will be an event of the very remote future.

THE OVERHEAD WIRE DISPUTE.—The controversy between the various electrical companies and the Board of Electrical Control, over the necessity for removing the numerous dead poles and countless dead wires throughout the city, is apparently as interminable and promises to be as barren of profit to either party as the similar war of words in progress between the companies and that remarkable body, the Subway Commission. The companies are manifestly evading the issue by putting in specious disclaimers of ownership of or responsibility for the unused wires and poles, while the other parties to the dispute obviously seek to shirk accountability for neglect to rigidly enforce the law in attempts to remove their burden to the shoulders of the Commissioner of Public Works. Meanwhile the destruction of human life through causes equally well-known to both disputants goes slowly but none the less surely on.

It is admitted by the fact that most of the cases of personal injury and death from electric shock which have occurred within the last two or three years, have been caused directly or indirectly by dead overhead wires coming into contact with electric light wires and again with telephone or telegraphic circuits; and in allowing them to remain a menace to life and property any longer than it will take to remove them, every company maintaining wires in actual use is equally culpable with the authorities charged with the duty of enforcing the laws in the premises.

Then, too, another and undeniably greater danger exists in the slovenly manner in which the electric light wires are strung throughout the city, some of them being carried upon poles scarcely capable of bearing safely half the strain imposed upon them, and often of insufficient height to lift the wires out of the way of vehicles passing under them, a fact which several recent instances of passing trucks tearing down low-strung wires attest. The questions as to the most suitable conduit for carrying underground wires, the proper time for and manner of putting the wires under ground, whether underground wires will work at all, and the other details involved in the disputes sought to be settled by a body of men totally ignorant of their duties on the one hand, and a combination of persons interested in avoiding additional expense on the other, are of vastly less importance than the one determining the degree of protection from danger to his life and property, to which the citizen in the course of his daily pursuits is entitled, and measures to permanently dispose of this paramount question should be immediately taken

ELECTRICAL INSTRUMENT MAKING FOR AMATEURS.—A practical hand book, by S. R. Bottone, second edition, enlarged by a chapter on the telephone, etc. Price $1.20, D. Van Nostrand, 23 Murray and 27 Warren streets, New York. The author of this work has wisely placed upon the market a second edition, enlarged by the addition of another chapter. If the reception of the second edition is as flattering as that accorded the first edition, we may expect the sale will warrant the author in preparing for other editions and many of them. The book does not pretend to teach the science of electricity, but it lays out certain simple rules for amateurs and students, which if followed, will save them untold trouble, time and expense. One student's experience is a mere repetition of another's and suggestions from one who has been "through the mill" are at times truly valuable. The explanations given of the various instruments, their uses, etc., are of the utmost importance, and no one intending to experiment electrically could afford to be without a copy of this book constantly before him.

RAILROAD SUPERINTENDENTS IN SESSION.

The seventh annual meeting of the Association of Railway Telegraph Superintendents was held at the Murray Hill hotel on July 11th, about fifty members being present.

A great deal of important business was transacted, but principally of a routine character.

The committee on Electrical Devices succeeded in furnishing an excellent exhibit of both electrical and mechanical devices. The railway induction system represented by Mr. S. K. Dingle, and various signaling arrangements and railway telegraph instruments, were given a very prominent location and a thorough investigation was made of them.

Among those present were C. W. Hammond and J. D. Gibbs of the Missouri Pacific; S. S. Bogart, W. J. Holmes, C. E. Topping of New York; Chas. Selden of Baltimore, Md., and others.

The display of The E. S. Greely & Co., was an excellent one, embracing the following: Victor Telegraph apparatus, register fire alarm and railroad to work on local or main line, open or closed circuit or both; railroad register, being arranged to start and stop automatically and for this reason enables a complete record of a Morse wire to be kept; indicating push button, which automatically registers at the button the fact that the distant bell has rung.

Albert H. Dakin, 60 Barclay street, New York, has sold a quantity of manifold and carbon papers to be sent to Singapore, India, and has made two additional sales for China and Japan, thus showing the superiority of American manufactures over those of Europe.

SOME TROUBLES OF TELEGRAPH LINES THAT ARE NOT ELECTRICAL.

BY WM. MAVER, JR.

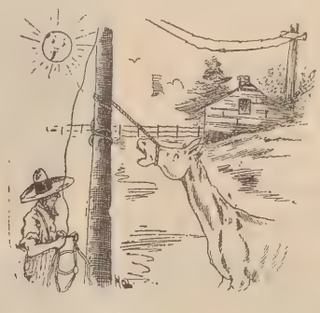
(*Continued.*)

Jumping from Persia to Mexico we find that here also the telegraph lines are not exempt from interference. As on the treeless plains of Africa so in Mexico the traveler, traversing the vast melancholy plains, finding the telegraph pole, accessible and admirably seasoned, cuts them down for firewood. "The humble ranchero, desiring a stock of wire with which to fence in an enclosure, cuts down a mile or two for use, leaving poles oftentimes prostrate." Then "there is the innocent-looking worm, the 'Jengen,' which assiduously honeycombs the poles till some fine day they fall at the breath of a breeze."

But Mexico is not the only country where the poles suffer from the ravages of insects. In Africa, Asia and elsewhere, ants and other insects are very destructive of them. It is related that in Texas, where a novel form of insulator, resembling an inverted tomato can, was for a time used on a Government line, the hornets of the locality, recognizing in the recess of the insulators a desirable habitation, brought into their self-appropriated nests so much mud, sour honey and other things that go to make hornet home life comfortable, that the lines became unworkable in damp weather, and the linemen who attempted to oust the intruders were punished so severely that the hospital was their abiding place for several weeks afterwards. On their recovery, as the story runs, the linemen made life so unpleasant for the inventor of the insulator that hefled the country. The hornets maintained their position until the blizzards of the next winter made it possible for a new gang of linemen to remove the nests and replace them with insulators of a less hornet inviting character.

"It is an ill-wind that blows nobody good." The Indians of Alaska found a bonanza in the abandoned telegraph wire of the Overland Telegraph Co., which was intended to connect Europe and America electrically, but which stopped short when the Atlantic cable was successfully laid. About 900 miles of this line was built at a cost of $3,000,000 before work was abandoned, and it is stated that the bulk of the wire has since been used by the Indians in making salmon nets.

Another instance in which the natives of a country have utilized the telegraph wire for domestic purposes, is reported by a correspondent in Chili, who says that the line from Santiago to Concepcion, which extends through a large tract of country inhabited by ignorant peasantry who have no respect for the institution nor fear of the law, is frequently interfered with :



"It is not uncommon for a peon to cut out a section of wire to repair a cart or patch a fence, and the writer has seen a blooming olive-cheeked country lass sporting a crinoline made of the same electric conductor." The correspondent adds : "Heavy storms often prostrate the wire and repairs are slow, and as all the virgins that bloom along the line are not yet supplied with crinoline, business men prefer the mails."

This mention of crinoline recalls the fact that when that appendage to the feminine costume was in full vogue in this country, it was a formidable rival to kite tails, and frequently occasioned the note in the linemen's report: "cause of trouble, 'a hoop skirt.'"

The fondness of bears for honey is well known, and presumably acting on the ungrammatical adage that "where there's bees there's honey," and following that up by assuming that where there is humming there are bees, bruin has been known to climb telegraph poles in the vain hope of securing a toothsome meal. This is, however, a case in which the "amusement" is not necessarily harmful. It depends a good deal on the weight of the bear and the diameter of the pole.

Another innocent, and apparently not altogether harmless amusement derived from the telegraph by the beast tribe, is that obtained by the monkeys in India and Central America in swinging from "pole to pole" on the telegraph wire. The Panama Railroad Co., so said the *El Siglo*, a Mexican journal, in 1870, was compelled to double the force of its telegraphic batteries on account of it being the custom of the monkeys, so numerous in that part of the world, to congregate and practice gymnastic exercise upon the telegraph wires. It was believed that the shock would be so strong that there would not be an acrobat in those woods to able resist its effects.

It would doubtless be interesting to see the monkeys gyrating on the positive and negative leads of an arc light circuit, especially in wet weather, and when the wire and insulation used is underwriters, sometimes called "undertakers'" wire. True, the fun might be of brief duration.

It is, however, perhaps as a rubbing post that the telegraph pole is most popular among quadrupeds. The buffalo, and cattle generally, in the Western States ; the bullock in Africa and the camel in Persia, all avail of its presence. In many cases the poles go down before their caresses. In others they withstand them, and in such instances travelers can see by the smoothness of the poles, to what constant use in this

respect they have been put. It is related that to prevent poles being knocked down in this way, the bright idea occurred to a telegraph manager in the Western States, that spikes inserted in the poles at suitable heights would be efficacious as a remedy. He imported a car load of spikes and tried them; so did the cattle. The result was not satisfactory to the manager, for apparently the spike-"protected" pole was considered by the cattle a veritable "Argyle" post, and every pole so equipped was laid low in short order. Iindeed, it would seem that the news must have beenbruited among all the cattle of the plains, for they came from far and near, as though a new salt lick had been discovered, and as will be seen by a glance at the illustration considerable kinetic energy was developed in getting there.

In South Africa one reason advanced by telegraph engineers why iron poles should be substituted for wooden ones was the readiness with which iron grew hot and cold. It was thought that this would prevent its employment as a rubbing post by the cattle; the supposition being that the animals would not cultivate the acquaintance of the pole at either extreme of temperature. This supposition gives cattle credit for the possession of a thinness of epiderm, not generally attributed to them.

It is alleged that on the sand plains of Arizona the telegraph poles undergo a marked decrease in circumference owing to the impact of the fine sand which is thrown against them by the high winds which prevail in that territory. In time, it is said, the poles resemble pipe-stems from the constant attrition.

It is often stated that myriads of birds are killed by coming in contact with the wires in their annual flights, which is easy to believe. On the other hand, however, it would hardly be expected that the telegraph lines would suffer from anything that the birds can do. Yet the news comes from Nova Scotia that there are cases on record where several spans of the wires have been prostrated by the onslaught of flocks of wild geese.

A somewhat more credible story, furnished as it is by Arkansas, is to the effect that wires of the smaller gauge have been broken on at least one occasion by the combined weight of a horde of buzzards as they awaited, with pompous mien, the demise of a wonnded ox by the side of the railroad track.

The two Arkansas linemen who vouch for the truth of this statement agree as to the breaking of the wire from this cause, but they disagree as to whether the wire broke before or after the buzzards had feasted. The weight of the testimony is, of course, with the lineman who held the after opinion.

In South Africa it was at one time the custom to equip every telegraph pole with a lightning rod, composed of a piece of telegraph wire, which extended from the ground to one or two feet above the top of the pole. This becoming bent it formed a roost for birds, the larger of which, by their weight, would frequently cause the rod to touch the regular telegraph line, thus grounding and disabling it. This became so troublesome that the lightning rods were ordered from the poles, but eventually a compromise was effected and a remedy provided by cutting off the rod one or two inches above the top of the pole.

I do not suppose that the foregoing, by any means, comprises all the methods of inflicting damage to telegraph property, and of harrassing the telegraph companies, known to animate and inanimate things, for there still remain the woodsman with his axe felling the tree that in its fall brings down with it the adjacent wires and poles; the warlike Arab of Africa, who cuts the telegraph wire to make points for his spears; the irate captains of the ships whose anchors have become entangled with the cable, who cut the cable to get the anchor free; the crunching of the cable by ice and icebergs, and not least, the Alderman with his vote inviting the telegraph and telephone companies to get their wires under ground, &c.

It, however, exhausts my stock on hand at present. If any of my readers should recall any cases bearing on the subject not related herein, perhaps they will narrate them.

THE FOUNDER OF THE WESTERN UNION TELEGRAPH COMPANY AT THE POINT OF DEATH.

Hiram Sibley, one of the best-known citizens of Rochester, N. Y., and whose fame in connection with the founding of the Western Union Telegraph Company extends throughout the country, is lying at the point of death. Hiram Sibley was born in North Adams, Mass., early in the century and moved to New York when young. His connection with the electric telegraph began when, upon the suggestion of Judge Henry R. Selden, he bought the interests of the owners of the House patent and organized the New York and Mississippi Valley Printing Telegraph Company, April 1, 1851.

In 1854 the company leased the lines of the Lake Erie Telegraph Company. Ezra Cornell had control of the Erie and Michigan Telegraph Company. After much negotiation the two companies controlled by Mr. Sibley and Mr. Cornell were united by an act of the Wisconsin Legislature dated March 4th, 1856, and of the New York Legislature a month later, under the name of the Western Union Telegraph Company.

Mr. Sibley conceived the idea of a line of telegraph to the Pacific, but not being able to induce the Western Union Company to undertake the project he personally undertook the venture, and finally secured from Congress an annual subsidy of $40,000 for ten years, and Nov. 1, 1861, Mr. Sibley took upon himself the responsibility of the construction of the line. In the mean time, the Overland Telegraph Company had been organized in San Francisco, and the two parties finally united in the Pacific Telegraph Company, Nov. 15, 1861. The line was opened from ocean to ocean, and on March 17, 1864, it was merged into the Western Union.

In 1869 Mr. Sibley sold out his telegraph interests and went into the seed business in Rochester and Chicago. The city of Rochester has benefited greatly by his generosity, Sibley Hall having been built by him at a cost of $100,000. To the Rochester University he was also a generous donor, and the Sibley College of Mechanical Arts of Cornell University marks his esteem for his friend Ezra Cornell. He has been in feeble health for sometime.

The Postal Company will extend its lines to San Pedro, Cal., during the summer months.

THE EVOLUTION OF THE ACOUSTIC TELEPHONE.

BY GEORGE F. SHAVER.

Comparatively few people are to-day aware of the perfection to which the acoustic telephone has been brought. Fewer still have any conception of the labor that has been bestowed upon it, and scarcely one in a thousand is familiar with the laws governing the phenomena observed in its use. But few of the many patentees of devices of this kind have understood the problem before them, as their work would seem to prove, nearly all of it being simply modifications of the so-called "lover's telegraph," which consist of a string or wire suspended between two parchment diaphragms and secured by a contact button resting against the diaphragms.

The general idea of the acoustic telephone even at this late day is that it is a very imperfect and unsatisfactory instrument, working tolerably well only under the most favorable conditions, and confined to a very short and straight line and incapable of transmitting the voice with any degree of distinctness during rain or wind storms, besides being extremely liable to get out of order. This opinion is based upon the experience with various forms of the instrument by different designers, until now the word "acoustic," as applied to the telephone, has become a synonym for worthlessness. This is unfortunate, as it retards the introduction of the perfected instrument now that it is "un fait accompli," the public being loath to experiment with that which it has so long considered a failure. This species of humbuggery has been given its full scope by dishonest venders of inferior apparatus, and as it is possible to obtain some results from almost any description of sounding board and tight wire, many new ones have appeared, only to be displaced within a short time.

The lack of success which has attended the efforts of most inventors in this field was not so much a lack of native ability as it was the absence of any well defined laws governing the subject, and the apparently contradictory results obtained by the same apparatus under varying conditions. Perhaps no branch of physical science presents so discouraging an aspect to the experimenter. An acoustic telephone line in its simple and common form is composed of two diaphragms located at a distance from each other and connected by a tight line. If all that was necessary was the conveyance of vibrations, it would be a simple matter to design a sensitive line wire and resonator, or telephone, for each end; but experiment with such an instrument develops the fact that it is utterly unfit for the transmission of speech, as each span of tight wire in the lines becomes a musical string, and when vibrated by the voice or by the wind, sets up a musical sound, the pitch being determined by its length, thickness and tension. The composite tone of the several spans being delivered at the telephones, together with the vibrations caused by speech, causes indistinctness, and during wind storms the sounds are entirely unintelligible.

My own attention was first called to the subject during the year 1875, while constructing a short telegraph line from my office to my house, a distance of about 500 feet. The wire was supported only at the ends, swinging over a sort of valley, and was fastened with a screw eye to boards resting across the window sills. When the telegraph instruments were connected I noticed that whenever the window at my house was raised, I could plainly hear the noise in the office, also the sound of persons walking in the room. I accidently discovered that rapping upon the supporting board would attract the attention of the people at the other end of the line, and upon examining closer and halloing near the board, indistinct words could be heard. I considered it of no importance and did not experiment further with it except to twist an insulated copper return circuit wire together for the main line, when I found the telephonic sounds were clearer. This I believe to be the first instance on record of the use of twisted or insulated wire upon a telephone circuit, though at that time I used it with but little satisfaction. During the Centennial year my interest was greatly awakened by the reports of Professor Bell's experiments, and I then commenced experimenting with the acoustic telephone, and have given my entire attention to it since, each year gaining point by point until now, when I am able to say that the work is complete, and an instrument

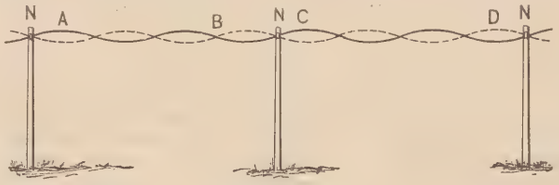


FIG. 2—IDEAL LINE FOR ACOUSTIC TELEPHONY.

of absolute certainty of action is produced, working as well over crooked as straight lines, and particularly unaffected by either wind or rain.

The first real step towards an increase of power and sensitiveness in this class of telephone was taken by Mr. Schuyler S. Parsons of Chatham Centre, Ohio, who departing from the old principle of a single connection to the diaphragm known as the button telephone, and by branching the line wire into a cone of several wires whose base rested against the diaphragm, secured greater power and increased sensitiveness, and by using silk for the diaphragm. This, while increasing the power of transmission, increased its sensitiveness to external vibrations, and the telephone became famous as an accomplished "howler" during even slight breezes. During the year 1879 Mr. Holcomb, then postmaster at Mallet Creek, Ohio, brought out my old experi-

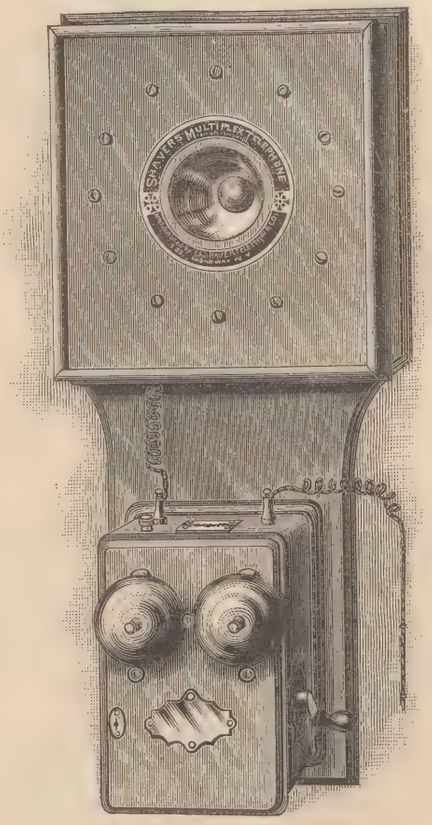


FIG. 1.—THE SHAVER ACOUSTIC TELEPHONE.

ment of twisted wires and his telephone was largely sold throughout the country under the name of the Amplifying Telephone. This instrument was strong and durable, but required most careful adjustment and was limited to nearly straight routes and was indistinct during wind storms, and also gave out a rushing sound.

At about this time I discovered that a hanger having

several points of connection enabled angles to be turned with but little loss of power, and, soon after, I found that nearly all reverberation could be checked by immersing the wire in paint, "Ulesote" being found to answer best. About the year 1881 Mr. John B. Bennett, of San Luis Obispo, Cal., designed a receiver for concentrating them to the ear by means of a flexible tube, and later, simultaneously with myself, brought out the single insulated acoustic wire which did away with the resonance or reverberation of the line wire. But it had this fault, that when saturated with water during rain storms its efficiency was greatly impaired, and upon lines of one thousand feet or more became almost inoperative.

During the years 1880 to 1886 inclusive, my attention was chiefly given to the development of a central exchange apparatus, and in the latter plans good results were achieved, lines being successfully connected and operated in any direction for a distance of one-half mile from the central office. This exchange was in use at the office of the Consolidated Telephone Co. for a year or more in the City of New York, and for four months in daily use at Tiffin, Ohio, when it succumbed to the great telephone monopoly and was withdrawn.

During the year 1885, I found that a cable composed of a number of wires twisted about a fibrous core obviated all resonance, and was affected but little when saturated with water. Not until 1887, however, was the secret of a wire totally unaffected by atmospheric influences discovered, but that it exists is now an open secret to all users of my later apparatus. During this year I also made a discovery which, I am inclined to think, has brought the acoustic telephone to perfection. It was the discovery of the combination of a parabolic reflector terminating in a vibrator to which the line wire is attached, the ordinary diaphragm being entirely done away with and an annular ring taking its place. These three elements are supported behind a sounding board which has an aperture at its centre, the focus of the reflector being at the centre of the aperture.

With this arrangement, shown in Fig. 1, it is possible to collect and deliver the ordinary lateral vibrations of the line wire at a focus, and in addition thereto, to utilize the molecular vibration of the line wire and connecting elements. The result is striking in the extreme, permitting, as it does, of talking over lines a mile in length and with various angles with great power and distinctness, and working perfectly under all conditions of wind and weather. All vibrations above the pitch of upper "G" of the musical scale are in this instrument entirely absorbed, so that whistling sounds, as of wind and the higher notes and vibrations of running machinery, etc., are not heard, although the sensitiveness of the instrument to lower tones remains unimpaired. It seems almost beyond belief that, although one may whisper over a line three-quarters of a mile in length or more, no sound other than that transmitted is heard, even when the wind is so violent that the line wire may be seen swaying and trembling from its power. It follows that no sounds of high pitch can be transmitted at all, whistling being entirely lost, although the rushing sound of the air passing the lips of the whistler can be plainly heard at the distant end. Perhaps it may not have been known before that the sound of whistling is a composite tone, the rushing sound not having been heretofore apparent, through the greater power and shrillness of the musical notes. Whether the acoustic telephone may still be subject to greater development remains to be seen, but that it is now equal to electrical apparatus for lines over a mile in length may be made apparent to any observer. The power of the instrument over half mile lines is so great that it is heard and understood fifty feet distant from the receiving telephone.

I might add that if it were possible to construct a line supported only at the nodes of vibration, as in Fig. 2, I see no reason why the same should not work for many miles. Built in this manner a line would present the following outline, although exaggerated for purposes of illustration, the supports *N N N* in the accompanying diagram being placed at the exact nodes or stationary points, being located upon any line under tension at one-half, one-fourth, one-eighth, etc., of the total length of the wire. It will be seen then, that should the supports be located indiscriminately along the line as at *A*, *B*, *C*, *D*, which occurs in ordinary work, the vibration is seriously checked whenever the fixed supports are between the natural nodes of the line, and the power of transmission will be diminished in proportion to the number of interferences of this kind. This explains why long lines sometimes work louder and give better articulation than shorter ones of no greater angularity. This trouble is largely obviated in the design of a hanger which will vibrate with the line when the point of support is located between the nodes.

The theory of a molecular vibration taking place upon acoustic lines, in addition to what may be termed the apparent or lateral bodily vibration, is illustrated in the multiplex telephone described, the molecular vibration being amplified by the expanding of the resonant surface of the receiving parabolic reflector. The action is the same as that observed in the experiment of scratching a log of wood with a pin, the sound of the pin not being noticeable until the ear is pressed against the log, when it is clearly heard at the opposite end.

THE HAMMOND TYPE-WRITER.

Since the type-writer has been so generally adopted in the telegraphic field for the copying of press dispatches, many telegraphers have cast longing eyes at the perfect alignment, uniform impression and superior work of the Hammond Type-writer, but have not attempted to utilize it in their work until quite recently, on account of its peculiar noise, which is more continuous than that made by the Remington or the Caligraph, although not so sharp, thinking the noise an effectual barrier between it and its successful adoption to the telegraph. But now it seems that the Hammond is destined to become as popular as its earlier rivals in the field. Two men at least are now using the Hammond in copying from the wire, with the most gratifying success, and judging from their enthusiasm over the machine and its beautiful work, the Hammond will soon take a bound into favor with telegraphers. The two men referred to are Mr. John A. Elms of the Western Union, Boston, and Mr. J. C. Gilhousen of Williamsport, Pa. They employ a very simple but effective method of disposing of the noise made by the Hammond. They cut two ordinary rubber balls in halves, place three of these halves under the machine, flat side down, making three solid feet, and are not in the least annoyed by any noise from the machine. Mr. Gilhousen first bought a type-writer and used it successfully in his telegraph work, but soon disposed of it for the purpose of securing a Hammond, on which he is now copying the Pennsylvania State Associated Press dispatches, which are sent special from Philadelphia to Altoona, York, Harrisburg, Wilkesbarre and Williamsport.

Operators will appreciate a few of the advantages enjoyed by the Hammond. It has ninety characters, including all the fractions, and gives two of any desired style of type. It writes a line nine inches long, and as its writing is much more compact than that of other machines, one line of its copy will make at least one and a half lines on the others, effecting a great saving of time in turning lines. The work it performs is simply perfect. The alignment can never be anything but perfect, and the machine makes its own uniform impression, giving its copy the neatness and regularity of a printed page. The machine will hold a continuous roll of paper sufficient to hold a whole night's report, rolling it up inside of itself, and that without the aid of reels. Not the least of its good points is the fact that it is portable and can he carried as easily as an ordinary satchel.

Now that its value in this field has been practically demonstrated, the Hammond's many good points will probably be eagerly examined by progressive telegraphers.

STATISTICS OF THE CONVENTION.

To meet the demand of the three hundred special correspondents during the recent National Convention at Chicago, the telegraph companies provided extra wires and a large corps of efficient operators, and it can safely be said that never before has there been a convention or any other event which sent out so much news as went forth from Chicago to the country during the convention.

General Superintendent Clowry, of the Western Union, says there has never been so large a telegraphic service anywhere as that of his company. The special matter from special correspondents alone amounted to five hundred thousand words a day from the time the convention assembled until it adjourned.

The United Press and the Associated Press sent out about 20,000 words per diem each over their leased wires. In all the wires of the Western Union Company have carried about 600,000 words a day, and reports and speculations on the convention, which were sent out from the Chicago office, amounted to about 6,000,000 words, or more than double the amount sent out from the St. Louis convention.

General Superintendent Clowry says that the telegraph companies never had the same facilities for reporting a convention to the country before or anywhere else. In the anteroom of the convention hall there were thirty direct circuits to thirty of the leading cities and towns of the country, and these were manned by forty competent operators. All matter for afternoon papers, all bulletins, and all important telegrams filed were sent direct from the convention hall. Mr. Clowry had a table directly in front of the Speaker's stand, and George Bain sat there with him making up bulletins. He had two assistants to change the manifold for him and help him with the figures on the ballots. Connecting that table with the operating room below was a pneumatic tube, which carried all bulletins and all press matter to the operators.

Bulletins were sent by the Western Union to every city and town along their lines free of charge during the sessions of the convention, so that the whole country was kept informed as to what took place. Six mounted messengers carried matter for morning papers from the convention hall to the main office at the corner of Washington and La Salle streets, where 350 operators manned the wires and kept them humming day and night. With the relays between 600 and and 700 men were employed by the Western Union Company to take care of the convention reports. Arrangements were also made throughout the country for close attention to the working of the wires. Special locomotives and hand-cars were in readiness at all times to repair breaks which might occur and and interfere with the service. But the weather was favorable and the service has been unsurpassed. No city can compare with Chicago for telegraphic facilities for reporting great conventions. The city is the greatest distributing point in the country, and located as it is can reach all parts of the country by direct circuit without repeating matter, as it would have to be if sent from New York. From Chicago we can reach New York and San Francisco, St. Paul and New Orleans by direct wire, without repeating messages anywhere.

When the convention was taking the last ballot for President lightning operators sat at their instruments with their fingers on the key ready to flash the nomination over the whole country and the world. Mr. Bain and his assistants in front of the Speaker's desk kept tab on the vote, and the instant enough votes were recorded for Senator Harrison to give him the nomination the signal was given, and away it went to the outside world before the convention realized what it had done. The nomination was read from the Speaker's desk in the House at Washington before the Indiana delegation began to shout in the convention, and in thirty seconds from the time he had enough votes his nomination was read in San Francisco. It was cabled to London and read in the metropolis of the world two minutes after, and before the vote was announced in the convention.

Superintendent Clowry says that there was but one operator in the wigwam in 1860, when Lincoln was nominated. In 1868, when General Grant was nominated in Crosby's Opera House, the Western Union officers and operators had the use of a proscenium box and four operators sent out the report of that convention from the hall. In 1872, at Cincinnati, there was a greater interest taken in reaching the country by full telegraphic reports, and fifteen operators were in the hall. Since then there have been special arrangements made, whereby the correspondents might file their matter in the convention hall. But there have been fully a million more words sent out from this convention than any other ever held. Superintendent Clowry has given his whole time to the convention, and has never been absent from his table in the hall during the session. Mr. C. H. Summers had charge of the editorial circuits, and was assisted by W. B. Somerville, of New York, and Superintendent Tubbs, of the Chicago office.

Chief Operator Lloyd at the main office, and Holligan at the convention hall, deserve the highest praise for their work. The newspaper men in the city spoke in the highest terms of praise of the way in which their reports were sent out, and the press associations also say the facilities were unequaled.

The Postal Company now have a Far Rockaway, Long Island, connection. This is a good business point and consequently will pay expenses from the start. The wire was built by Mr. J. W. Roloson, one of the New York chief operators, who owns the line.

The Long Island life saving stations are being connected with one another by telephone.

The new cable connecting Martha's Vineyard with the main land has been successfully laid.

FOR SALE.

Parties desiring to purchase any of the following electrical patents, please address H. D. Rogers, Patentee and Agent, No. 75 Maiden Lane, New York.

1. Patent No. 290,121: Electrical Conductor. A conductor for carrying the heavy currents in electric lighting, and the distribution of power by electricity, and for other purposes.

2. Patent No. 290,122: Electrical Conductor or Cable for Lighting and other Systems. A conductor or cable for supplying electric lamps, motors and similar apparatus, designed to obviate or lessen the danger to life and property, liable to occur with ordinary conductors.

3. Patent No. 281,223: Electric Conductor. A conductor or cable having the insulating material between the several layers of wires, strips,or the like,electro-plated (when desired), so as to secure strength with economy of material and space, a valuable invention, new and novel.

4. Patent No. 292,694: Insulated Conductor of Electricity. A fire-proof compound for bare or insulated wires.

5. Patent No. 139,690: Printing and Dial Telegraph and Circuits therefore. A combination of a dial or printing instrument in one main line circuit upon one base, a unique and valuable device.

6. Patent No. 305.022: Self-sustaining Electric Battery. A battery of large and constant electro-motive force, and to obviate polarization.

7. Patent No. 310,724: Secondary Battery and means for transporting the same. The object of this invention is to accumulate electric energy in suitable storage chambers at natural sources, add convey the same to desirable points, by land or water, in apartments adapted to the vehicles conveying the same, also for a device for running trains, etc., by dispensing with the third rail.

RAILROAD TELEGRAPHERS' CONVENTION.

The Grand Division of the Order of Railroad Telegraphers began its third annual session in Indianapolis, June 20. Rev. M. L. Haines of that city delivered an invocation. Rev. O. C. McCulloch delivered an address of welcome, which was responded to by Hon. G. B. Solders, of Cleveland, Ohio. Past Grand Telegrapher P. W. McAllister also welcomed the delegates, after which A. D. Thurston, Grand Chief Telegrapher, delivered an address. He said at the beginning the O. R. T. had been opposed by many railroad companies, but now they were satisfied it was an order not calculated to work injury to them, but rather to improve that branch of the service. They were now aiding the order. After Mr. Thurston came Assistant Grand Chief Telegrapher C. J. Coombs, of Newton, Kansas, who delivered a brief address showing the growth of the order, and expressing confidence in its future prosperity. Following is list of delegates :

California, I. C. Parish, Barstow ; Colorado, Wm. R. Freeman, Denver ; J. M. Rector, Los Animos ; F. M. Moore, Pueblo; Dakota, W. E. Van Amber, Halton ; Georgia, P. H. Sellars, Atlanta ; Illinois, J. A. Bardeaux, C. A. Sherman, J. H. Meyers, C. B. Hawley, L. E. Sessions, R. W. Sears, R. L. Nellis, Chicago ; W. A. Bryan, Peoria ; C. E. Hallis, Chrisman ; Nebraska, G. B. Riker, Covington ; J. E Morris, Plattsmouth ; H. Compton, Omaha ; W. G. Cone, Lincoln ; Indiana, T. M. Pierson, W. A. Harvey, O. A. Soaper, O. R. Brown, H. G. Crowe, I. S. Pierce, Indianapolis ; L. H. Clarkson, Valparaso ; T. B. Shirley, Galveston; T. G. Gallagher, Covington; Geo. T. Sweeney, O. N. Tomlinson. Terre Haute; H. B. Brown, Russellville; J. F. Parish, T. E. Lewis, Roachdale; Iowa, A. D. Thurston, A. A. Byerly, H. G. Adams, S. A. Wagner, S. O. Fox, La Porte City; J. E. Rice, W. F. Doran, J. J. McElrath, Cedar Rapids; E. B. Wurzbacker, Carroll; E. McDonald, Sioux City; C. W. Holmes, Oasis; I. B. Haymond, Northwood; A. G. Kamm, W. G. Russell, Burlington; A. B. Stilwell, F. L. Herling, Dubuque; J. W. Lashelle, Iowa City; Kansas, A. J. Applegate, Wichita; C. E. Adams and H. E. Wasson, Leavenworth; W. C. Carson, H. C. Kist, C. J. Coombs and H. C. Marshall, Newton; Henry Smith, J. D. Sutherland, Atchison; Kentucky, N. H. Kirch, T. W. Hutchinson, W. W. Ware, of Lexington; Maryland, J. B. Finnan and W. G. Wheeler, of Baltimore; Michigan, Miss M. E. Dunwoodie, H. B. Markle and J. Matson, Detroit; C. H. Gates, Jackson; P. G. Bromley, Tilsonburgh; Minnesota, F. J. Eikan, Perham; J. O. Bell and Miss L. S. Griswold, St. Paul; H. S. Heisler, Duluth; T. S. Wilcox, Kasota; H. W. Brown, Utica; E. A. Hinds, Alexandria; E. S. Tobey, Waseca; P. W. McAllister and J. J. Barrett, Minneapolis; C. E. Hand, Litchfield; H. Britton, Waseca; A. T. Behnke, New Ulm; Mississippi, M. B. Rice, Flora. Missouri, F. M. Peare, St. Joseph; J. L. Code and J. N. Ashley, Kansas City; D. O. Freeman, St. Joseph; A. C. Nye, Springfield; Montana, J. E. Murphy and E. E. Quackenboss, Terry; New Mexico, W. S. Bouton, Las Vegas; New York, E. E. Barnes and J. T. Connors, Albany; Miss Ella R. Bixby, Canton; E. J. Blakesley, Buffalo; H. B. Buddengberg, Jamestown; Ohio, T. C. Eddy, W. L. Hayne and A. J. Hall, Cleveland; D.C. Larcomb, H.S. Lamdin, J. Hargrove, Columbus ; H. W. Meader and A. W. Brant, Toledo ; J. T. Milton, Navarre ; B. F. Hubbs, Middletown ; D. V. Ault, Alliance ; W. T. Burt, Denison ; G. M. Sanderson, Canton ; Pennsylvania, C. E. White, Econsburg ; T. J. Bradley, Pittsburgh ; Tennessee, R. P. Wall, Memphis ; Texas, Miss Lillie Thornhill and G. T. Thornhill, Navastota ; J. B. Douglas, Denison ; R. L. Darling, Dallas; W. B. Mitchell, Killen.

Thursday was occupied hearing reports of grand officers. Grand Chief Telegrapher Thurston in his annual address states : The order was organized June 9, 1886, at Cedar Rapids, Iowa. There were 75 members to start with, The second annual meeting, held at Chicago last year showed that the order had grown to 2,500 members, and now there are 90 local divisions with a membership of between 9,000 and 10,000, and growing rapidly.

The Grand Secretary, S. O. Fox, reports the order in a flourishing condition, with over $3,000 in treasury, and out of debt. In the last year something over $3000 had been expended for benevolent purposes among members, in addition to the insurance branch. The committees on credentials and permanent organization made their reports, which were adopted. The judiciary committee consists of J. A. Bordeaux, chairman ; J. B. Finnan, C. E. Adams, T. C. Eddy, O. H. Wilson.

A resolution was offered favoring the establishment of postal telegraphy, but this was voted down by a good majority.

Saturday, as a number of delegates were obliged to return to their homes, was occupied in electing officers for ensuing year with the following result :

Grand Chief Telegrapher, A. D. Thurston, La Porte City, Iowa ; Assistant Grand Chief, A. Johnson, Louisville, Ky. ; Grand Secretary and Treasurer, S. O. Fox, La Porte City, Iowa ; Grand Senior Telegrapher, F. M. Moore, Pueblo, Colorado ; Grand Junior Telegrapher, T. C. Eddy, Cleveland, Ohio ; Grand Inside Sentinel, E. E. Barnes, Albany, N. Y. ; Grand Outside Sentinel, J. E. Gibson, Meridian, Miss. To fill vacancies, J. A. Bordeaux and J. O. Bell were elected members of executive committee.

It was decided to hold next annual meeting in Cleveland, Ohio, June, 1889. A resolution was introduced to raise salary of the grand chief $500, and grand secretary and treasurer $300 a year, but the resolution failed to pass, though a resolution to appropriate the above amounts to those officers for present year was passed.

It was decided to remove the headquarters of the order from La Porte City, to Vinton, Iowa, where the order is given a ten years' lease of suitable quarters and moving expenses to the amount of $500.

It was decided to change the time of meeting to the month of May, instead of June, to take effect in 1890.

The Telegrapher, the official organ of the order, which heretofore has been published as a private enterprise, now becomes the property of the association, and will be improved.

In addition to the insurance and sick benefit features, the association has an employment bureau which procured employment for over 200 last year.

The Electric Subway Commissioners have asked the District Attorney to indict the different telephone, telegraph and electric lighting companies, whose suspended wires are a constant menace to life. The District Attorney says he cannot indict corporations.

There are four and a half miles of electric road in operation at San Diego, Cal., half a mile in construction, and eighteen and a half miles projected.

Electric welding has now been put on a commercial basis. A company has been formed, mainly by Boston capitalists, with a capital stock of $500,000, which will turn out welding machines. The machines will be sold, but the company has a royalty on every weld made by their machines. To make this practical a meter is set upon them all. This meter has upon it three dials resembling those on a gas meter. By its peculiar construction, it is claimed, it will not register unless a perfect weld is made. The new company is backed by considerable capital, by which it is enabled to buy up all the experimental electrical welding methods in the country. These machines will weld anything in the shape of metal. They do not require that both metals shall be of the same material, as iron has been welded to brass in the experiments tried. The machines as they are now built will weld an iron cable or a watchspring with equal readiness.

DEATH BY ELECTRICITY.

Dr. Richardson writes on this subject in the *Asclepiad* as follows : "In some researches on the application of the electric discharge for the painless extinction of the lives of animals to be used as food, the details of which I recorded in the *Medical Times and Gazette* for the year 1869, this mode of death was any thing but certain in its effects. Sheep stricken apparently into instant and irrevocable death by electricity, after a few minutes showed signs of life, and if they had not been dispatched in the ordinary way by the knife would have been restored to consciousness. The same fact has been observed in attempts to kill dogs by the electric shock, and I once published an instance in which a large dog, struck into perfect unconsciousness by the stroke from a powerful battery, was submitted to a surgical operation while lying, to all appearances, dead, and was yet so little affected as to make an easy and sound recovery. It need not be inferred from such facts as these that the electric shock will not kill at one discharge—in most cases it will—but, exceptionally, instead of killing outright it will simply stun, and may induce the semblance of death instead of the real event. It will be only common humanity, therefore, for the authorities of New York, when they begin to give the *coup de grace* by the electric shock, to supplement the process by a *post mortem* examination of the victims, so that the act may not be crowned by burying the victims alive."

The building of the Edison Electric Illuminating Company in Boston Mass., says the *Scientific American*, was lately destroyed by fire, although it was supposed to be fireproof. It was built of brick and iron, but unfortunately, they laid down wooden floors and sheathed the walls and ceilings with varnished wood. When the fire broke out, the wood produced such a tremendous heat as so warp the iron beams and quickly caused the destruction of the building. Every dynamo in the station was destroyed—the engines and boilers, however, were not injured. New dynamos were telegraphed for at once, and on the Monday night succeeding the fire—which took place on Saturday night—the establishment was again in operation, and the Edison lights throughout the city were working as usual. The conflagration was caused by the overheating of one of the equalizers, by having more current pass through it than it was designed to carry. The fire was thus communicated to the adjoining woodwork.

UNDERGROUND CABLE FOR ARC LIGHTING.

The Standard Underground Cable Company has just closed a contract with the Brush Electric Illuminating Company of New York, for furnishing and placing in position in the New York subways between 14th and 34th street, in Broadway, a little more than one mile of eight conductors, No. 4 B. & S. G. arc light lead-covered cable. This is the first contract made in New York for underground cable to be used for arc lighting. The Standard Underground Cable Company guarantees the cable.

There has been considerable agitation in telegraphic and newspaper circles during the past two weeks, which goes to show that the craft is unusually active. Some of the overzealous newspapers volunteered the information that a strike was contemplated. This is an error. The organization is one of peace and good will to all employers, and this policy is bound to win new friends for the order in all directions, even among the employers. Another strong feature of the organization is the rejection of applicants who are addicted to the use of strong liquor. Many applications for charters for local assemblies are being received from various points and much good will ensue by their re-establishment. The outlook is flattering.

The telegraphers of New York will hold their fifth annual summer-night festival, at the Empire City Coliseum, 68th street and East River, Friday, August 3d. The affair is in charge of the following well-known telegraphers : Messrs. English. Hart, Hernon, Foster, Newton, Morrison, Smollin, Felleman, McSwyny, Quick and Walsh. No efforts or expense will be spared to make the affair a grand success.

How Science Advances.—"He who wishes to keep abreast with the march of science to-day must leave the college and go to the workshop and into the dark corners of private laboratories, for investigators rarely have time to write, so that text books are years behind the science itself." —*Prof. Elisha Gray.*

An important decision was lately made in the United States Court at Indianapolis, by Judge Gresham, in the case of Chas. F. Brush *vs.* John Owens and others. It was claimed by the patentees that the patent covered the use of the electro-magnet, but the judge held the patent to be limited only to solenoids.

Mr. E. G. Waters of Terre Haute, Ind., was in this city during the Railroad Superintendents' Convention, representing the Waters-Sweeney Telegraph and Telephone Swich Co. of Terre Haute, Ind.

The capital stock of the Union Telegraph Co. has been increased from $100,000 to $200,000. It is proprosed to extend the lines from North Adams to Boston and to other eastern points, also to Plattsburgh, N. Y.

The amount of sales of the Sprague Company in stationary motors during the past month has exceeded that of any other month during the existence of the company.

Mr. W. M. Callender, the well-known cable manufacturer, returned the first of the week from a London visit of several weeks.

Mr. J. F. Magurie has been appointed superintendent of the New York & Greenwood Lake division of the N. Y., L. E. & W., with headquarters at Jersey City, N. J.

Mr. J. D Gibbs, circuit manager of the Missouri Pacific, Sedalia, Mo., is in this city visiting friends. He is a member of the Railroad Telegraph Superintendent's Association.