

TELEGRAPH AGE.

A SEMI-MONTHLY JOURNAL DEVOTED TO TELEGRAPHY.

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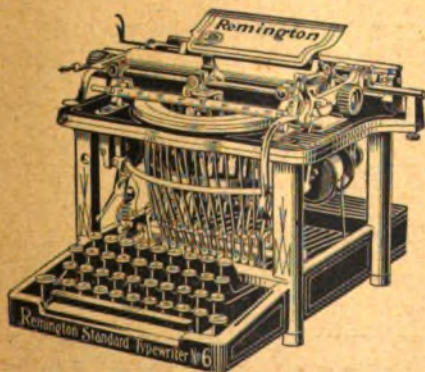
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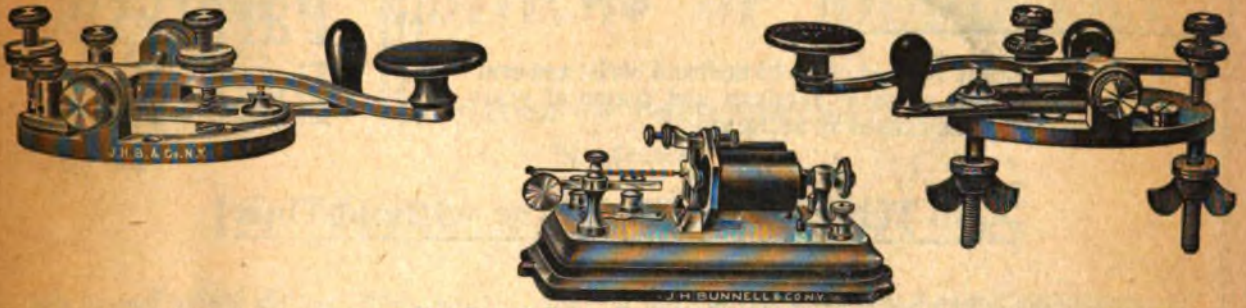
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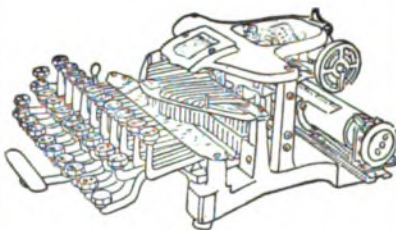


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THE TELEGRAPH AGE

No. 23.

NEW YORK, DECEMBER 1, 1903.

Vol. XX.

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

A Few Questions Answered.

[In the second paragraph of the article appearing in this column in the November 16 issue, entitled "The Western Union Telegraph Company's Standard Wheatstone Bridge Portable Testing Set," credit was given to Mr. E. Willing for devising the same. The testing set was devised by the electrical engineering department of the Western Union Telegraph Company, and to that department alone belongs the entire credit for that very useful combination.—Editor].

A number of questions propounded by readers having accumulated on our table we will devote space in this issue to their consideration.

An eastern correspondent asks:

Why is platinum always used for the leading in conductors which connect the carbon filament of incandescent lamps with the sockets, or external circuits? Would not copper serve the same purpose?

Platinum is employed because it is the only suitable metal that will expand and contract under sudden changes of temperature in the same degree as glass, and at the same time with-

stand a high temperature without melting. When the mouth of a glass bulb of an electric lamp is fused around the leading in conductors for the purpose of rendering the interior airtight, the high degree of temperature necessary to melt it obviously affects the metal conductors, hence it must be such as will withstand the great heat without melting and at the same time expand and contract equally and in step with the glass. Copper would melt under such a temperature, while it and other metals expanding or contracting out of step would shatter the glass bulb during the process of fusion.

A subscriber at Buffalo inquires:

(1) In a continuous current arc light circuit why do they invariably place the positive carbon above, instead of below the negative carbon?

(2) Why do alternating currents consume both carbons at an equal rate?

(1). The positive carbon of a continuous current arc light lamp is placed above its companion for the purpose of throwing the light downward in a useful direction. The light comes from the crater which always forms on the positive stick, as it is that stick which is eaten away by the current. The residue of carbon which is volatilized and forms the arc is deposited on the lower or negative stick, which latter, theoretically, should grow longer, but in reality is simply slowly burned in the air owing to the high temperature of the arc.

(2). The carbon sticks in an alternating current arc lamp are consumed at an equal rate because each receive an equal amount of attention from the positive impulses.

From Philadelphia a decision is required.

Will you please decide the following bet? A claims that the "short end" of a quadruplex draws more current from the battery than the "long end." In other words, that when the transmitter is open and sending .15 milliamperes of current to the line, more current is consumed than when it is closed and furnishes 50 milliamperes. B claims the opposite is true.

If gravity battery is used A wins. If the dynamo arrangement obtains, B is right.

Where a row of gravity cells is used three-fourths of the number are shunted out when the transmitter is open and consequently do not work. The full pressure of a dynamo, however, feeds the circuit regardless of the position of the transmitter although its position does regulate the amount of current that gets into the external or main line. When closed the length of the circuit which the machine feeds is 600 ohms lamp plus the joint resistance of the main and the artificial lines. When open the length of the circuit is 600 ohms

lamp plus 1,200 ohms added resistance plus the joint resistance of the main line, the artificial line and the 900 ohm leak box. Now, the joint resistance of a number of circuits is always somewhat less than that of the shortest route to the ground. In this case it is through the "leak," that is to say, 600 lamp, 1,200 "added" and 900 leak=2700 ohms.

Hence with the transmitter open the current drawn from a dynamo is (on long circuits), practically

$$\frac{300 \text{ volts.}}{\text{Something less than 2700 ohms.}}$$

With it closed it is

$$\frac{300 \text{ volts.}}{600 \text{ lamp} + \text{joint resistance of main and artificial line.}}$$

600 lamp + joint resistance of main and artificial line.

The resistance of every quadruplex set, counting lamp and main line coil of two relays, is alone about 1300 ohms with transmitter closed, making 2600 ohms, actual resistance, counting the set at the distant end of the circuit. To this must be added the resistance of the wire connecting the two offices.

An "Old Reader" desires to know—

Why is it necessary to short circuit a newly made bluestone battery jar for several hours before it will yield a proper strength of current? Is there any way of making the battery available at once?

A new battery will not give out a strong current at first because the pure water in the jar offers too high an internal resistance. The object in short-circuiting the cell for a time is to decompose the water and saturate it with a solution of sulphate of zinc acid which latter reduces the said internal resistance of the jar, thereby lessening the amount of work done within the cell itself. From this it follows that when a cell is required for immediate use, it may be made efficient at once by adding a little sulphate of zinc solution to the water when the jar is first filled.

A "Western Subscriber" "seeks information," and asks:

When an ammeter shows that the "short end" of a distant quadruplex battery is giving a strength of current, say 30 to 35 milliamperes, where it should be but about half that amount, and the long end shows a less value than it should, what part of the apparatus is most likely causing the trouble?

The transmitter. In the majority of cases it will be found that a high resistance has developed at the tongue of the transmitter through dirt, imperfect adjustment of contact points, or improper tension of the retractile spring. The abnormal resistance thus added to the short route to the ground via the leak, prevents the proper drop in electromotive force at the tongue, and thereby causes the main line wire to be fed at too great an electrical pressure. It is always a safe rule to suspect the transmitter under these circumstances.

An "Anxious Inquirer" propounds the following query:

Why do you prefer to have the distant battery cut in and the key closed at that point when eliminating the line static by means of the condenser? Would the process not be as thorough with the distant key open?

Our choice favors the closed position of the home relay because it is during the period of closed contact points only, that a feeble static discharge from the line can interfere with a signal during the process of the latter's actual formation. Hence if the static be effectually eliminated at the moment it is most dangerous, it must necessarily be harmless where its effect is weakened by an air gap between the front and back contact points of the relay.

Business Notice.

The Viaduct Manufacturing Company, of Baltimore, Md., advertise on another page in this issue, a very convenient portable telephone set, useful for linemen, either telephone or telegraph, in testing for trouble, etc. It contains a full set of telephones, magneto bell, transmitter, receiver, battery, switch cut-out and ringer.

The telephonic and other products of this old established concern bear the impress of excellence, for expert and conscientious care enters into the manufacture of all Viaduct goods. Especially in manufacturing for various telegraphic purposes, in which a large business is done, Mr. Davis, the president of the company, possesses a ready and keen knowledge of requirements, his long personal experience as a telegrapher serving him in good stead.

Recent Telegraph Patents.

No. 742,066.—Geometric Telegraph. Grant B. Rossman, New York.

No. 743,948.—Printing Telegraph. Walter S. Steljes, London, Eng. A device for moving along its spindle and for holding in its required printing position, a type wheel having two or more rows of letters.

Nos. 743,011 and 743,012.—Telegraphic Transmitting Attachment for Typewriters. Albert E. Morelock, Topeka, Kan. An attachment for typewriters wherein the stroke of a key suffices to put in operation mechanism which automatically transmits the dots and dashes which denote the letter represented by the key.

No. 743,122.—Printing-telegraph Receiver. James D. White, London, England. An electromagnetic printing device comprises a type cylinder having circularly arranged series of alphabets or characters disposed around the cylinder, with each letter of each circular series repeated in rows parallel to the axis of the cylinder. A hammer cylinder is arranged parallel to the first-named cylinder and bears a single row of spirally arranged impact faces. Electromagnetic actuating devices for both cylinders are to be operated by electric currents. The hammer cylinder is arranged to move laterally to deliver the printing

blow, and electromagnetic feeding devices for the paper make up the rest of the apparatus.

Personal Mention.

Mr. H. L. Shippy, well known to every telegrapher in New York and vicinity, treasurer of the John A. Roebling's Sons Company, the wire manufacturers, is seriously ill from an attack of appendicitis.

Mr. Frank Jaynes, general superintendent of the Western Union Telegraph Company, San Francisco, Cal., left for home, accompanied by his wife, a few days since. Mr. and Mrs. Jaynes derived much enjoyment from their New York visit of three weeks.

Recent New York Visitors.

Mr. R. C. Baker, manager of the Western Union Telegraph Company, Peoria, Ill.

Mr. Frank Richardson, of the Western Union Telegraph Company, Chicago, Ill.

Mr. E. W. Day, chief clerk, Baltimore and Ohio Railroad Company, Baltimore, Md.

Mr. C. F. Ames, superintendent of the Western Union Telegraph Company, Boston, Mass.

Mr. F. E. Clary, superintendent of the Western Union Telegraph Company, Richmond, Va.

Mr. C. A. Darlton, superintendent of telegraph of the Southern Railway, Washington, D. C.

Mr. W. W. Hicklen, manager of the Western Union Telegraph Company, Cedar Rapids, Ia.

Mr. W. P. Cline, superintendent of telegraph of the Atlantic Coast Line, Wilmington, N. C.

Mr. W. F. Williams, superintendent of telegraph of the Seaboard Air Line, Portsmouth, Va.

Mr. E. B. Pillsbury, superintendent of the Postal Telegraph-Cable Company, Boston, Mass.

Mr. I. McMichael, general manager of the Great North Western Telegraph Company, Toronto, Ont.

Mr. Charles C. Adams, general superintendent of the Postal Telegraph-Cable Company, Atlanta, Ga.

Mr. E. A. Smith, superintendent of the Fitchburg division of the Boston and Maine Railroad, Boston, Mass.

Mr. Charles Selden, superintendent of telegraph of the Baltimore and Ohio Railroad Company, Baltimore, Md.

Mr. J. Ridgway, of the West Indies and Panama Telegraph Company, San Juan, Porto Rico. Mr. Ridgway will spend three months in the United States for the benefit of his health.

General Mention.

Mr. Geo. H. Albee, Windsor, Conn., in a recent letter writes: "Enclosed find check for renewal. The Good Book tells us that 'the laborer is worthy

of his hire.' The editor of TELEGRAPH AGE is surely worthy of his pay for his efforts in making what I consider one of the most valuable magazines published—higher in value every year."

Mr. J. C. Thomas, formerly manager of the Postal Telegraph-Cable Company, at Topeka, Kansas, but for the past six months in the lumber business at Auburn, Ind., in remitting to cover his subscription for another year states that he must continue as a subscriber as he profits by the good advice TELEGRAPH AGE is wont to contain. He hopes, however, that he can exchange for future subscriptions sawdust in car load lots. The fact that Mr. Thomas has sawdust by the car loads is a sure indication that he is prospering in his new business.

Resignations and Appointments.

Mr. J. A. Finch has been appointed manager of the Postal Telegraph-Cable Company, at Aniston, Ala., vice J. R. Scott, resigned.

Mr. W. Percy Robinson, formerly assistant circuit manager at St. John, N. B., of the Canadian Pacific Railway telegraphs, has been advanced to be manager, vice P. W. Snider, promoted.

Mr. Walter Gross, of Memphis, Tenn., has been appointed manager of the Western Union Telegraph Company, at Huntsville, Ala., vice T. J. Gouldman transferred to Greenwood, Miss., in a similar capacity.

Mr. Wm. J. Meloney, manager of the Western Union Telegraph Company, at Atlantic City, N. J., for the past twelve years, has resigned his position to accept the management of the White Clay Creek Supply Company, with headquarters at Avondale, Pa.

Mr. H. H. Riggleman, a well-known and enterprising New England telegrapher, has been appointed manager of the Western Union Telegraph Company at Springfield, Mass., vice F. A. Bardwell, resigned, to assume the management of a broker office.

Mr. Isaac Morris, who resigned the management of the Western Union Telegraph Company, at Cleveland, O., to take effect November 1, will on December 1 assume the management of the National Automatic Fire Alarm Company, of Ohio, with headquarters at Cleveland.

T. M. B. ASSOCIATION.—Assessment, number 414, has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of John K. Regan, at Hornellsville, N. Y.; William J. Higgins, at San Francisco, Cal.; John M. Young, at Chicago, Ill., and George W. Boss, at Minneapolis, Minn.

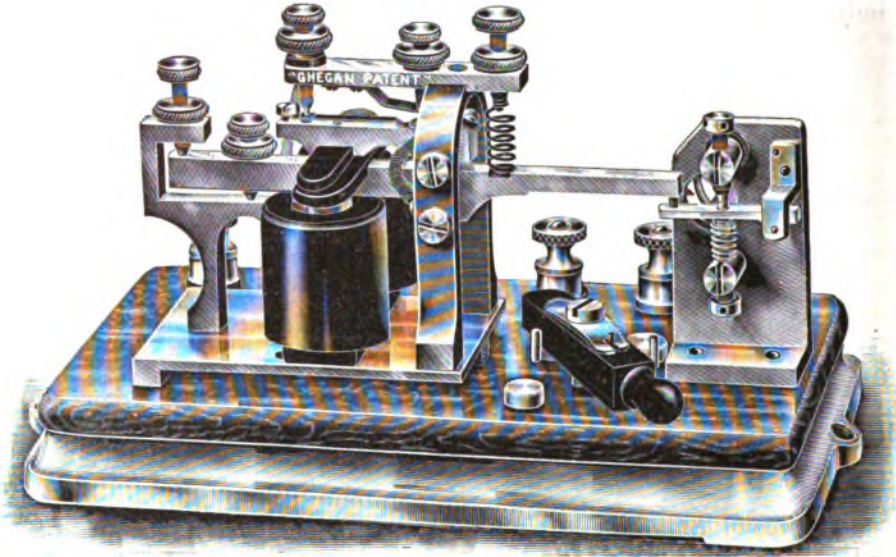
No up-to-date telegrapher can afford to be without TELEGRAPH AGE. Send for a sample copy.

The Postal Company Adopts the Ghegan Repeater.

The test of many types of single repeaters recently made in Buffalo by the Postal Telegraph-Cable Company resulted in the selection of the Ghegan repeater as the best available for the company's service at the present time, everything being considered.

up of two Ghegan transmitters and two ordinary relays.

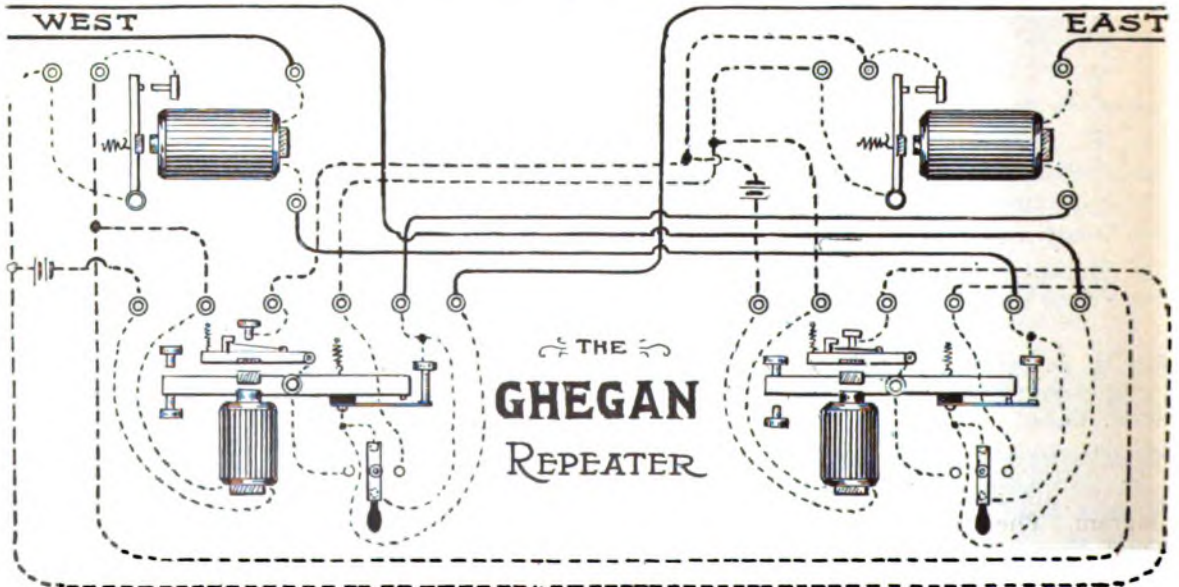
The fact that an armature on being drawn towards a magnet becomes itself magnetic by induction, and that the closer it approaches the magnet cores, the stronger the magnetism becomes, are the novel principles utilized in this repeater.



THE GHEGAN CIRCUIT CONTROLLER OR TRANSMITTER.

This is the report given out at the office of the general manager of the company. Although we illustrated the Ghegan repeater a few months ago, the subject is deemed of sufficient import-

It will be noticed that, besides its ordinary armature repeating contact, the Ghegan transmitter is provided with a second armature mounted above the regular one. The lever of this sec-



BINDING POST CONNECTIONS.

ance to warrant its reproduction at this time. The repeater is the invention of Mr. J. J. Ghegan, a well-known old time telegrapher, now the vice-president of J. H. Bunnell and Company, New York.

A complete set of automatic repeaters is made

and or superposed armature carries a spring contact so arranged that it makes contact with its back stop the instant that the armature begins its upward movement, and does not break contact therefrom until its downward stroke is almost completed, so that with two-circuits connected

to the contacts of the transmitter armatures, one of the circuits so connected is always closed before the other is opened, by the movements of the armatures.

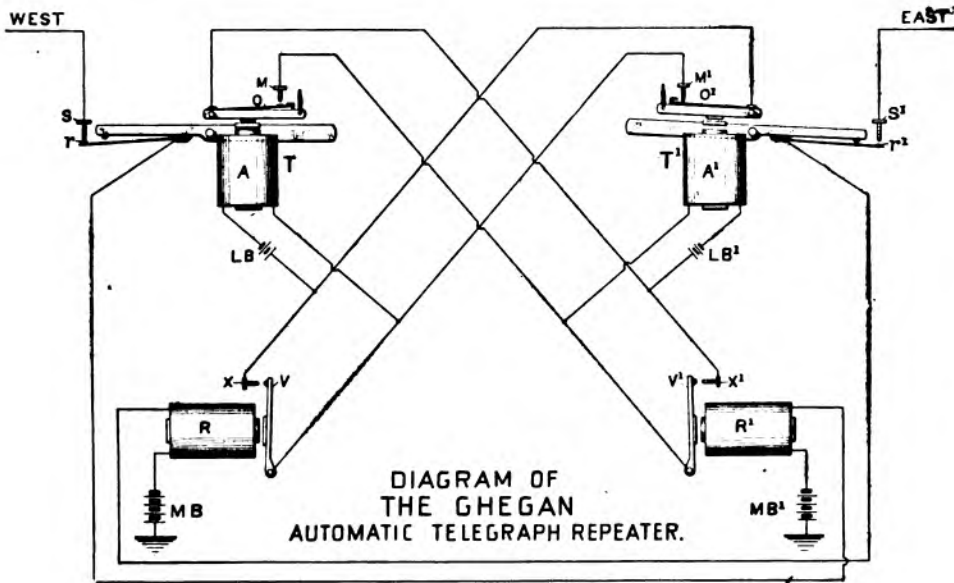
The second armature is adjusted so that, on closing the local circuit of the transmitter, the regular armature must reach its front stop before the magnetism induced in it is sufficiently strong to draw the second armature from its back stop. The object of this is to allow a sufficient margin of time between the closing of the main circuit by the downward movement of the first armature and the opening of the shunt circuit by the subsequent downward movement of the second armature, to permit the opposite relay in the main circuit to close its local contacts before the shunt circuit around them is opened. This margin of time between the closing of the main and the opening of the shunt circuit enables these repeaters to work well even on leaky lines where the relays act so sluggishly as to render other types of automatic repeaters useless.

$s^1 r^1$, and, as already explained, after sufficient time has elapsed to permit the armature of relay R to reach its front stop, opens the shunt circuit of transmitter T at $M^1 O^1$.

Should east "break" when west is sending, the armature of relay R would remain on its back stop, thus breaking the local circuit of transmitter T, on the first downward stroke of the superposed armature of transmitter T^1 , and so break the western circuit at s r.

There being no extra weight or attachment of any kind to either the relay or transmitter armatures, the quickest possible action can be obtained with this repeater. There being no extra magnets a minimum of current is required. As both relay armatures work in unison, it can always be seen at a glance if the signals are being properly repeated.

The transmitters are provided with switches for working the lines independently or putting them together at will, and when once set, need practically no attention, the only adjustment necessary being that of the ordinary relay.



The diagrams show how the main, local and shunt circuits are to be connected.

The operation of the repeater is explained as follows:

When a key on the western circuit is opened the instruments assume the positions shown in the diagram. The armature of relay R^1 , first falls back and opens the local circuit of transmitter T^1 , which in turn opens the eastern circuit at $s^1 r^1$, thus causing the armature of relay R, to fall back. This falling back of the armature of relay R, however, does not affect the local circuit of transmitter T, because before the eastern circuit was broken at $s^1 r^1$, the shunt around the local contacts of relay R was closed at $M^1 O^1$.

On closing the western key, the armature of relay R^1 closes the local circuit of transmitter T^1 , which in turn first closes the eastern circuit at

A New Year's Message.

The authorities of the United States Naval Observatory are anxious to furnish to the civilized world a signal of the exact moment of the beginning of the new year. It is proposed to arrange with telegraph and cable companies all over the world, so as to transmit by a series of signals at midnight on December 31 the moment the new year begins. It is believed this information can be imparted to all points in North and South America, the distant colonies and all around the world, wherever necessary co-operation can be secured. Last year this was done to a limited extent, and it was found that the receipt of the midnight signals was accurately timed at the Lick Observatory, in California, and that the message only took 6-100 of a second in transmission.

The Cable.

The House Committee on Naval Affairs prints a letter from Mr. George G. Ward, vice-president and general manager of the Commercial Cable Company, New York, and a letter to Senator Platt from the contractors who are to build the cable stations at the Midway Islands. These islands, the terminal and starting point of the mid-ocean section of the all-American Pacific cable, are absolutely desolate, save for the temporary cable stations and the cable employes. There are no safeguards to navigation and there is no suitable harbor or anchorage ground. A vessel carrying food from Honolulu to the cable staff on the Midway Islands was wrecked on a coral reef there on October 22, and everything lost; whereupon the Navy Department sent the Iroquois thither from Honolulu with supplies. According to Mr. Ward and the contractors, the approach to the islands is so dangerous under existing conditions that insurance cannot be obtained on ships undertaking the voyage.

The islands are surrounded by a ring of coral some eighteen miles in circumference. The lagoon inside can be made a safe harbor. The company and the contractors ask the Navy Department to recommend an appropriation for blasting an entrance through the coral reefs so that vessels may anchor in the lagoon; to buoy the channel and put lights at the entrance and to provide landing facilities.

As the Government must protect the cable, in case of war, and as its vessels will call at the islands from time to time, these measures, says the "New York Sun," are necessary. Besides, in the general interests of navigation the United States are bound to afford due marks and lights to mariners. They are also bound to police the Midway Islands, their property. Mr. Ward asks for "marines or guards of some character to maintain order" on the islands. At present they are without a government. Nobody is charged with enforcing the laws. Nobody has any authority. However idyllic in theory, this state of things may easily be inconvenient.

The Railroad.

A patent, No. 743,852, for a block signal system, has been issued to Israel H. Francisco, Rutland, Vt.

A patent, No. 743,245 for a railroad signal and alarm has been granted to Albert E. Caughey, Omaha, Neb. Electromagnets automatically ring a bell when their circuits are completed by the movement of the trains upon the tracks.

A patent, No. 743,878, for an electrical block signal, has been granted to William S. Jackson, Hoboken, N. J. A shoe moved transversely to the semaphore by an electro-magnet, raises the semaphore, the withdrawal of the shoe permitting it to fall by gravity.

Mr. H. H. Blair, has been appointed superin-

tendent of telegraph and telephones of the New York, Susquehanna and Western Railroad Company with headquarters at Towanda, Pa. Mr. Blair has been identified with this road in various capacities for twenty years past.

To dispense with pneumatic and electric motor railway signals, Mr. Clyde J. Coleman, of New York, says the Electrical World, has just patented a system wherein a supply of liquefied gas is depended upon to furnish the means to operate the signals, in combination with electrical circuits. Carbonic acid gas is specifically referred to in the claims which number no fewer than 112. It is stated that a portable storage tank containing fifty pounds avoirdupois of such gas is capable of operating an ordinary semaphore signal over 12,000 times. Great economy of installation, maintenance and operation is predicted on the new departure.

The Miller locomotive cab signal is now in use on the Harlem line of the New York Central and Hudson River road, from Harlem River at 133d street, New York City, southward to 55th street, a distance of about four miles. This is a four track line and is traversed by the passenger trains of the New York Central and Hudson River and the main line of the New York, New Haven and Hartford, 500 to 600 trains a day altogether. The line is equipped with controlled manual block signals, the block sections being between 3,000 and 4,000 feet long. The Central road is equipping about 100 of its locomotives with this cab signal device, and probably sixty or more locomotives of the New York, New Haven and Hartford road will also be equipped with the apparatus.

THE RAILWAY SIGNAL ASSOCIATION.

The Railway Signaling Club held its annual meeting at Detroit, Mich., on November 10 and 11. The convention was called to order by the president, Mr. H. C. Hope, superintendent of telegraph of the Chicago, Minneapolis, St. Paul and Omaha Railroad, St. Paul, Minn.

It was decided to change the name of the organization to the Railway Signal Association. The recommendation of automatic signals for single track railroads was deemed not advisable by the committee having the subject in charge. If automatic signals are used they should be considered as merely an adjunct to the telegraph block system. The cost of copper and iron wire for line circuits was discussed at some length. The discussion covered the matter of economy of waterproof insulation. The chief object in using insulated wire is the protection of the wires from crosses with telegraph and electric line wires, or other wires carrying powerful currents, which interfered with the signaling apparatus. For iron wire it was stated that waterproof, not rubber insulation, is useful in preventing rust.

The next annual meeting will take place at St. Louis, Mo., the date not yet being agreed upon.

The officers elected for the ensuing year were: President, J. C. Mock, Michigan Central, Detroit,

Mich.; vice-president, Lawrence Griffith, Grand Central Station, New York City; secretary-treasurer, B. B. Adams, editor "Railroad Gazette," New York; member of executive committee, L. R. Clausen, Chicago, Milwaukee and St. Paul.

Charles F. Annett, of Chicago, lately assistant superintendent of telegraph of the Illinois Central Railroad, has patented (No. 743,418) a valuable improvement in switch-lamps. It relates to switch-lamps lighted by means of incandescent electric light bulbs, the chief object of the invention being to provide means whereby a single bulb may illumine the switch-stand and adjacent switch connections without permitting the rays of light to become confused with the rays of light emerging through said lenses. Heretofore switch-lamps have usually been constructed to throw light laterally through the lenses of the lamp; but as the rays of light were constrained to penetrate only horizontally the switch operating parts and those portions of the ground and of the track immediately surrounding the lamp remained dark and it was necessary at night for the switchman or brakeman in operating the switch to carry a lantern with him and use it to reveal the condition of the switch-operating parts. By means of this device no lantern is required to show the position of the target and connected parts, and where a switch-stand of sufficient height is employed the rays of light will fall not only upon the switch-operating parts, but on the switch-point itself, thus enabling the operator to determine at a glance whether the various parts of the switch are in proper operative condition. It is also the object of the patent to prevent undue vibration of the lamp and to provide means whereby the lamp-shell may be readily removed and yet afford protection to the lamp bulb when said shell is not present. The patentee contemplates certain other improved details of construction.

This device has already been in use over a year at Freeport, Ill., on the line of the Illinois Central where about one hundred switches lighted by electricity have been in successful operation. During this entire time not a single failure has been recorded.

Wireless Telegraphy.

The erection of a new Marconi station has been commenced at Fraserburg on the Aberdeenshire coast, for the purpose of testing the large power stations overland.

The system of wireless telegraphy to be employed by the Western of France and the London, Brighton and South Coast Railways between Newhaven and Dieppe is that invented by M. Octave Rochefort, a French engineer.

In the report of the Indian Telegraph Department for the year 1902-3 it is stated that wireless telegraphy has been established between Sangor Island and the Sandheads, and difficulty is only experienced during thunderstorms.

It is announced that the Italian Government will soon begin on the royal estate of San Rossore the construction of an extraordinarily powerful wireless telegraph station for the establishment of communication between Italy and the Argentine Republic.

It is stated that a demonstration of the De Forest wireless telegraph system will shortly take place between Holyhead and Dublin, and that it is the intention of those interested in Great Britain to incorporate the British Empire De Forest Company upon the completion of the tests.

Professor Sylvanus P. Thompson, F. R. S., delivered an address on Tuesday, November 3, at the Hampstead Conservatory, London, England, on wireless telegraphy. The lecturer gave a brief resume of the history of the science, including the earlier experiments of Morse, Lindsay, Preece, Edison and Tesla. A number of interesting illustrations was shown, and the lecture concluded with the transmission of a message selected by a member of the audience, between a near-by station and the lecture room. The apparatus used on the occasion was that employed in the Lodge-Muirhead system. Dr. Thompson advocated an international agreement with regard to the reception of wireless signals, and said that there was no foundation for the newspaper talk that wireless telegraphy had been the cause of bad weather.

The London Times of November 10, states that during Mr. Marconi's voyage to Gibraltar on board H.M.S. "Duncan," from October 24, the date on which the vessel left Portsmouth, messages were received on board daily. The weather was exceedingly rough in the Bay of Biscay, and one of the special wireless telegraph gaffs which had been fitted to the topmasts to support the elevated conductors connected to the special Marconi instruments, was carried away. Notwithstanding that this mishap necessitated a considerable reduction in the height of the masthead wires, the reception of messages on board continued in an uninterrupted manner. The messages generally consisted of ordinary current news bulletins and a few private messages; but on October 28, the day the ship arrived at Gibraltar, an official message of instructions to Capt. Jackson from the Admiralty was received on board. During the stay of the "Duncan" at Gibraltar, from October 28 until November 3, various other tests were carried out with the object of ascertaining the relative efficiency of different forms and arrangements of aerial wires. Messages were always received at the anchorage from England with regularity when the arrangement which Mr. Marconi had anticipated would be necessary for the purpose was used. Numerous tests were also carried out between Poldhu and the Marconi naval station situated on the Rock of Gibraltar. Messages were correctly received at this station (notwithstanding that the whole of Spain intervened between it and the station in Cornwall) in the presence of Rear-Admiral Sir William Acland, Capt. Jackson, and several other officers.

These tests were watched on board the "Duncan," on behalf of the Admiralty, by Capt. Jackson, and at the Poldhu station by Lieut. F. G. Loring, R.N. It was ascertained that the ordinary short-distance Marconi instruments supplied to the Admiralty were not interfered with or affected by the action of the electrical waves radiated from Poldhu.

We note in the November North American Review a statement from Mr. John L. Waterbury, United States delegate to the recent wireless telegraph conference in Berlin, as to what was discussed at that important gathering, says the Electrical World. It would seem inevitable from his statement that another conference must soon follow if any practical results are to be reached; and without general agreement it would seem that there must be trouble. When it is held, it is to be hoped that some respect will be shown for the rights of inventors and pioneers. Anybody who reads Mr. Waterbury's report can detect the tendency of the various governments to dispose of the whole subject as seemeth best to them, because of their alleged rights of eminent control over the telegraphs. It should surely be easy to put some restraint on rival systems without going to the other extreme and leaving them virtually stripped of reward or protection. All the great pioneer work of Marconi, for example, in oceanic wireless, is to go for nothing; and, unfortunately, according to, and possibly with the aid of, Mr. Waterbury, such a piece of high-sea robbery is to have the United States as a party to it. The Marconi Company is nothing to us, and we consider that Mr. Marconi still has to make good some of his most vital claims; but to brush their work aside or insist that *volens volens* they or others shall be made to turn their land plant over to universal use by Tom, Dick and Harry, without due compensation, strikes us very much like high-handed confiscation. There is surely a more equitable way out of the difficulty than that. For example, Mr. Fessenden might have a most expensive and elaborate tower system, while Dr. De Forest, without towers, might have signaling apparatus that everybody gave preference. If the Fessenden people, selling or leasing no apparatus, were compelled to receive all De Forest messages, as the present international scheme proposes, without right to secure some proper compensation, they might easily be bankrupted in six months, although on the use of their property the transmission depended. Other equally unfair combination of conditions under this ruling reported by Mr. Waterbury can readily be imagined. Even if a man is a common carrier, he has some common rights left.

In an interesting paper contributed by D. Mc-Nichol, of the Northern Pacific Railway Company, St. Paul, Minn., published in the Official Proceedings of the September meeting of the North-West Railway Club, the following passages occurs:

"Just two years ago I mentioned in a paper read before this Club that at that time the extent to which wireless telegraphy was being used was for short distances over water, and that some of the trans-

atlantic liners were being equipped with experimental apparatus. Since that time the science has outlived the experimental stage, and to-day the Marconi company alone has nine stations doing business in this country, two in Cuba, twenty in Great Britain, two in Germany and one in Belgium. Twenty-three transatlantic steamers are equipped with their apparatus for commercial purposes. The English navy has thirty-two war vessels and five naval stations equipped with the Marconi apparatus; the Italian navy twenty ships and five land stations. This company has also in operation across the English channel a system of multiplex transmission by which messages are sent in opposite directions without in any way interfering. Connected with the company are some of the most conservative business men and electrical men in America, and at the present time the Marconi factories are crowded to their full capacity turning out instruments for new installations. The question as to whether wireless telegraphy will displace the wire system and render valueless the immense amount of property represented by the latter is a question that does not yet confront us, but we have it from Mr. Willis H. Jones, one of the greatest telegraph engineers of the day, that the growth and extension of power transmission lines already so seriously interferes with the working of telegraph wires that, regardless of the great improvement in the physical condition of the lines, the quadruplex circuits of to-day do not work nearly as well as those of a decade ago. The induction disturbances caused by trolley lines, power transmission lines and lighting plants has surely kept pace with the extension of those systems, and it is rapidly getting to a point where the telegraph will have to get off the earth in order to do business; and although the wireless system was discovered a little while before it was actually needed, it was probably discovered just in time to insure its perfection by the time it will be the only means of taking care of the world's telegraphic traffic.

"As regards the use of the system in time of war, it seems to me that wireless telegraphy has a decided advantage over the wire system. It is not only an easy matter to tap a wire line, but easier still to destroy it; which is not the case with wireless telegraphy; for even if the enemy succeeds in intercepting a message, he cannot prevent it from reaching its rightful destination, and it would be saying little for human ingenuity if cipher codes could not be devised which would defy decipherment by parties not in possession of the key.

"We should not, however, expect wireless working to be more satisfactory at present than is the wire system. We all know that it is a comparatively easy matter to tap an ordinary telegraph wire, and that the law provides for the punishment of wire-tappers. It is safe to say that as soon as wireless telegraphy comes into general use, and the handling of the business thoroughly organized, there will be no difficulty whatever in arranging the different circuits throughout the world, so that what is generally spoken of as interference will be known only as wire-tapping and will be considered a criminal offense."

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NEW YORK, December 1, 1903.

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The Need of Effort.

Some one has remarked that the best asset an operator could possess is knowledge and good judgment. In a word this means brains. The need of thoughtful men, men who use their brains, is as apparent in the telegraph service as in every other line of business. The trouble with most of us is that we simply don't think. A thoughtful man is apt to carefully consider and ponder over the business in which he is engaged, studying out methods wherein it may be benefited, whether by the adoption of wiser management or by the application of new principles. A man who does not think generally does not care, and he is the one who looks in vain for promotion.

How often do we hear it remarked by the salaried man: "What is the use; it is simply a question of salary with me, my employer is entitled only to that which he pays for."

Yes, and it is a poor rule that does not work both ways. An employee is entitled only to that which he earns. His earning capacity is governed by the intellectual use to which he devotes his mind. Men may argue to the contrary as speciously as they please, but the truth of the statement remains undisturbed because it is fact. Some men may be of greater intellectual calibre and gifted with special mental endowments more pronounced than in others, and so in the order of things rise higher, financially or otherwise, but in the main this only further proves what has been said. For, other things being equal, most men find their own level. It may be a level of mediocre opportunity or even of hardship, but it is a plane reached in obedience to the working of a natural law.

No man who reads these lines should misunderstand the correct import of their meaning, misfortune, for which we may not be directly responsible, sometimes falls to our lot, and the cry incident to its severity is entitled to human sympathy and human aid. But untoward circumstance and argument does not and should not absolve the individual from honest, close thinking and intellectual effort. A man may so train and school himself in this direction of mind and action as to develop latent powers and so enable him to rise above his surroundings and conquer his way in the world. The world respects and favors a conscientious, painstaking and intellectual man. Reward awaits him; if not in one way then in another. As has so often been said, and truly, places at the top are awaiting those who are able to take them. Ask any banker, any merchant, any manufacturer, the telegraph companies, or other large employers, if this be not true. The emphatic Yes would swell into a resounding response the country over.

Every man must be the architect of his own fortunes, and thoughtfulness, faithfulness, earnestness, large mindedness, care—brains, if you please, must be the governing factors in this expanding and upward development of true and suc-

cessful manhood. By Divine injunction men are enjoined to the cultivation of their best abilities.

The telegraph operator at the key who by intelligent study and careful application is gaining a thorough knowledge and mastery of his business; holding himself steady and aloof, not from his fellows, but from all fanatical isms of the day, is surely placing himself in the direct line of promotion. This will not be because of any question of sentiment, but because efficiency will compel recognition. And this is the kind of recognition that counts. It is the only kind of demand that will be honored or that deserves to be honored.

The award of promotion may not come, possibly, in the telegraph service, although the need of capable men to fill high positions was never so urgent as now, but in the widening electrical field an acceptable place awaits every earnestly striving telegrapher of capacity. An engineer who is beginning to acquire a reputation, and commanding a salary of \$3,500 per annum, a year ago was an operator. He fitted himself for a higher position by close study and hard work, a practice he did not abandon when recognition of his fitness for better things was not early forthcoming. Studying still, sticking to his post and waiting his reward finally came. This is one case of many. These should be more. There might be more.

What Constitutes Success?

Wealth, influence, position, character—which? When we speak of success, says the "Express Gazette," in the ordinary sense we mean the acquirement of wealth. But success—real success—is something very different from this. It is possible for a man to be a colossal failure financially and yet be a splendid success. The greatest success consists in the achievement of noble character. A man may, therefore, be surrounded by the evidences of success, but the essence—the reality—is not there. No struggle is equal to the struggle with self. There is a struggle for self and a struggle with self. One is financial, worldly, and, followed to its ultimate goal, leads to degradation and ruin. It is the life that, seeking its own to financial success, drifts along the easy, worldly current of thoughtlessness and selfishness. The other is noble, inspired by the Infinite, and leads to sweetness and light—heights of which we can but dimly dream. It is the persistent, unceasing, uncomplaining, manly, self-respecting struggle toward character.

It is stated that fifteen hundred employes of the Western Union Telegraph Company, own stock in that corporation. It is also reported that only about five hundred or six hundred employes of the Pennsylvania Railroad Company are owners of Pennsylvania Railroad stock. This would indicate that there are a greater percentage of Western Union employes owning stock in the employing company, than in any other corporation in the United States.

Wire Stealing in England.

In England the telegraph, telephone and railroad interests are subjected to the same inconveniences as in this country by petty wire thieves who steal the copper wire from their poles for the purpose of selling the same to junk dealers. We clip the following paragraph on this subject from an English contemporary:

"Four youths were charged at Wimbledon police-court with being concerned in stealing a quantity of telephone and telegraph wire, valued at £9. 4s. 6d., belonging to the London and South Western Railway Company. Prisoners were also charged with being concerned in unlawfully and maliciously cutting down, removing and destroying a number of telegraph and telephone wires, thus preventing and disturbing communication at Earlsfield on October 26 and other dates. It was stated that on twelve separate occasions, during a period of several months, a quantity of telephone and telegraph wire had been cut with pincers and removed from the poles, no less than 2,636 yards of wire being thus cut away, preventing communication between the signal boxes and other centres for several hours. Prisoners were committed for trial."

A Renovated Office at Miami, Fla.

The office of the Western Union Telegraph Company at Miami, Fla., has lately received an entire renovation and is now one of the prettiest business offices in that place. The woodwork has been painted with white enamel paint, which lights up the entire room. The walls have been papered with a highly decorative design, and the counters and instrument tables have all been varnished. The improvements will be highly appreciated by the public. This office is one of the important ones of the State, which, besides taking care of a large amount of local matter, is also the Cuba cable station. W. H. McDonald, the manager, is justly proud of his new surroundings and of his office. He is a most genial and accommodating official and has hosts of friends who are congratulating him on the artistic results of his efforts to obtain good quarters for his office.

Electric Building Loan and Savings Association.

The regular meeting of the shareholders of the Electric Building Loan and Savings Association, New York, for the purpose of electing auditors and nominating officers to be elected at the annual meeting of the association, will be held in the office of the corporation, 195 Broadway, New York, on Friday, December 11, at 5 p. m. The annual meeting of the shareholders will be held at the same place, on Friday, January 8, 1904, at 5 p. m. Polls for the election of officers will be open from 2 p. m. until 5 p. m. upon the day of the annual meeting.

The Magnetic Club Dinner.

The regular autumn meeting of the Magnetic Club occurred in the banquet hall of the St. Denis Hotel, New York, on Wednesday evening, November 18. It was an unusually large gathering, one of the largest and most enjoyable ever held, one hundred and seventy-five gentlemen sitting down to the tables, members of the profession from many sections of the country being present. Included among the guests of the club were the delegates to the annual meeting of the Telegraphers' Mutual Benefit Association, which occurred on the afternoon of the same day. The dinner, which the St. Denis knows so well how to provide, was excellent, and the entertainment was of a high order. Mr. W. Tomkins, the well known character actor and humorist, kept the audience in roars of laughter, concluding his part with a pathetic character sketch which in its intensity held the close attention of his listeners. The speeches, taking their special direction and tone because of the presence of the guests named, were mainly devoted to the good that was being accomplished by the Telegraphers' Mutual Benefit Association, which has up to the present time distributed the vast sum of over a million and a quarter of dollars among the widows and orphans of deceased members. After coffee was served President Francis W. Jones rapped for order, and in appropriate remarks welcomed the members, the visitors and guests. The secretary, Mr. R. J. Murphy, read letters of regret from Col. R. C. Clowry, Thomas F. Clark, Orrin S. Wood, H. P. Dwight, Clarence H. Mackay and Col. Albert B. Chandler.

Among the applications for membership submitted at the meeting were those of State Senator George W. Dunn, John C. Sager, chief of the city electrical bureau, George G. Glenn and J. E. Janney, all of Philadelphia; Benj. Nachmann, president, and A. R. Carmichael, manager, of the International Cable Directory Company, J. B. VanEvery, vice-president of the Western Union Telegraph Company, J. Frank Howell, J. E. Hoey and E. Payson Porter, all of New York.

Mr. Belvidere Brooks, president of the Telegraphers' Mutual Benefit Association, was the first speaker. He stated that although he had already made two speeches before the attending delegates of his association, he wished to take advantage of the occasion and to further express the hope that every one present when returning to his home would do so imbued with a firm determination to assist this organization of the telegraphers to record an even greater success during the coming year than that achieved during the year just ended. He added that if every member of the profession would only recollect that every time he paid a dollar into the association that the entire amount thus paid in went to assist the widows and orphans, perhaps of old personal friends, he would feel that he was helping along a cause whose philanthropic object should appeal with irresistible force to all. At the same

time he called attention to the fact that the association is the oldest and most substantial assessment organization in the United States, a circumstance which was in itself something every telegrapher had reason to feel proud of. Mr. Brooks concluded his remarks by expressing the hope that all those who were not members of the association, yet who were eligible to membership, would enroll themselves and by this means aid the magnificent work being accomplished by this most deserving of all fraternal associations.

Mr. Wm. H. Baker, vice-president and general manager of the Postal Telegraph-Cable Company, who was the next speaker, observed that he was glad to be able to endorse all that had been said regarding the beneficial character of the Telegraphers' Mutual Benefit Association, which he did most cordially. He said that as he had become a member of that organization himself when but fifteen years of age, he felt that even in his boyhood days he realized the importance of the effort that was being undertaken by this brotherhood.

In an allusion to old-time telegraphers, President Jones referred to the career of the venerable Orrin S. Wood, from whom a letter of regret had been received, stating that owing to indisposition he could not be present at the banquet. Mr. Wood is the oldest, and was the first Morse telegrapher in the world. His career at the key began in the year 1844, when Prof. Morse opened his first line, that between Washington and Baltimore, to demonstrate the usefulness of his invention. Mr. Wood will be eighty-six years of age on December 14. Mr. Jones then introduced Mr. S. S. Garwood, of Philadelphia, who in a humorous vein objected to be classed with the forty-niners of the telegraph. Mr. Garwood went on to elaborate on the great practical good the Telegraphers' Mutual Benefit Association was fulfilling. He concluded his remarks by paying a glowing tribute to the messenger boys, of whom he said: "We all love to meet and encourage in our daily walks of life."

Mr. C. A. Darlton, of Washington, D. C., superintendent of telegraph of the Southern Railway, at the conclusion of Mr. Garwood's remarks, suggested that all those present who began their telegraphic careers as messenger boys should stand up, and at President Jones' request fully seventy-five of those present rose.

Mr. E. Payson Porter, of New York, a forty-niner of the telegraph, and the first operator to use a typewriter in connection with telegraphy, which he did in Chicago in 1869, was the next speaker. Mr. Porter stated that he began his telegraphic employment at the age of twelve and such was his fondness for his profession that he had enjoyed every day of his life at the key since that time.

State Senator W. C. Burton remarked that it was always a pleasure for him to speak at a Magnetic dinner. He referred to the unusual number of delegates who had attended the an-

nual meeting and were present at the dinner and said that various reasons had been assigned for their coming in such numbers, undoubtedly the admirable work which the Telegraphers' Mutual Benefit Association is doing accounted for it in a large degree, but he believed that it was also in a measure due to the fact that we had recently had an election, and as the town was now supposed by many strangers to be wide open, doubtless the visitors were interested in a study of municipal government under these conditions.

Among those present were:

Albany, N. Y.—W. H. Doherty, E. J. Kerwin.
 Atlanta, Ga.—W. T. Barton, C. C. Adams.
 Baltimore, Md.—Chas. Selden, E. W. Day.
 Boston, Mass.—E. B. Pillsbury, F. M. Ferrin,
 E. A. Smith.
 Bridgeport, Conn.—H. V. Shelley.
 Chicago, Ill.—Frank Richardson.
 Jersey City, N. J.—I. A. VanDuzen, J. B. Bertholf.
 New York, N. Y.—Frank Collyer, J. E. Hoey,
 F. J. Scherrer, W. J. Dealy, Charles P. Bruch,
 Geo. P. Kurtz, W. G. Magowan, D. W. Mc-
 Aneeny, G. F. Manson, P. C. Whittier, E. B.
 Baker, S. B. Murray, F. E. McKiernan, E. J.
 Rankin, D. F. Mallon, A. P. Eckert, C. H. Bris-
 tola, John Costelloe, F. W. Dillingham, C. F. Leon-
 ard, Wm. Mayer, Jr., J. B. Taltavall, Fred Pearce,
 C. F. Pearce, M. R. Cockey, E. E. Brannin, J. F.
 McGuire, W. B. McCurdy, A. P. Morris, J. Burry
 R. C. Fitzgerald, P. W. Barton, G. W. Hickey,
 E. G. Willyoung, J. W. Bartlett, J. C. Willever,
 W. D. Francis, Charles E. Yetman, F. J. Hunt,
 C. C. Duvall, J. J. Ghegan, I. M. Post, W. J.
 Watson, H. L. Patterson, M. W. Hamblin, E.
 M. Mulford, D. C. Donohue, Wm. Marshall, Wm.
 S. Logue, G. R. Johnston, C. C. Johnson, Geo.
 W. Conkling, G. E. Harding, Wm. H. Baker, L.
 F. Dowling, G. F. Porter, Ed. Sawyer, J. B. Sa-
 bine, J. P. Kohler, M. J. O'Leary, R. W. Chap-
 man, Wm. Holmes, F. Canchios, J. Burns, E. B.
 Bruch, B. Brooks, J. C. Barclay, J. B. VanEvery,
 J. F. Cleverdon, W. S. Cleverdon, J. R. Reming-
 ton, A. E. Price, W. M. Haines, Wm. Finn, F.
 Kitton, J. B. Korndorfer, E. W. Sargent, H. S.
 Young, W. D. Schram, W. J. Austin, A. R. Car-
 michael, Benj. Nachmann, J. C. Watts, W. C.
 Burton, Dr. L. R. Hallock, J. W. English, E. P.
 Porter, C. D. Reed, M. W. Rayens, A. H. Ken-
 nedy, W. J. Morrison, D. Fuchs, W. J. O'Brien,
 T. J. Smith, R. W. Scheffer, J. E. Hager, J. F.
 Ahearn, J. M. Phelan, P. J. Casey, R. E. Fagan,
 T. A. Brooks, R. J. Murphy, T. E. Fleming, C.
 Meyers, J. Hall Jones, E. Payson Porter, F. W.
 Jones, F. D. Murphy, G. Irving, C. Rafford, Her-
 bert Smith, T. E. Russell, A. F. Kelly, J. A. Hill,
 W. Shone, C. H. Gaffney, M. W. Jones, L. Dres-
 dner, M. H. Kerner, R. E. Bristol, T. L. Cuyler,
 Jr., W. S. Eckert, J. F. Skirrow, J. F. Howell, E.
 T. Fisher, H. R. Clark, G. H. Usher, H. F. Haw-
 kins, E. C. Platt, S. F. Jones.
 Peoria, Ill.—R. C. Baker.
 Philadelphia, Pa.—C. A. Stimpson; F. E. Maize,

W. E. Vanarsdale, G. G. Glenn, S. S. Garwood
 J. E. Janney, John C. Sager, L. Lemon, Geo. W.
 Dunn.

Portsmouth, Va.—W. F. Williams.

Richmond, Va.—C. T. Sydnor, F. E. Clary.

Saratoga, N. Y.—H. L. Waterbury.

Washington, D. C.—C. A. Darlton, W. J. Collins.

Wilmington, N. C.—W. P. Cline.

Annual Meeting of the Telegraphers' Mutual Benefit Association.

The thirty-seventh annual meeting of the Tele-
 graphers' Mutual Benefit Association was held at
 195 Broadway, New York, on November 18, Pres-
 ident Belvidere Brooks in the chair. Frank C. Coyle
 was elected secretary of the meeting.

After greeting the delegates, President Brooks
 requested the secretary to read the report of the
 president, which was as follows:

"At this the thirty-seventh annual meeting, it
 affords me great pleasure to welcome, and to con-
 gratulate you, on the prosperous condition of the
 association, and its prospects of increased useful-
 ness and value, as shown in the ample reports of
 the secretary and treasurer about to be present-
 ed. During the year, and especially in the last
 quarter, the association was favored with a very
 low mortality, there being but fifty deaths re-
 ported in the full grade, three in the half grade,
 and none in the second division. Because of this
 the executive committee was enabled to add \$15,-
 000 to the reserve fund, as against \$5,000 during
 the previous year, bringing the par value to
 \$209,711.73, which is equal to 4.03 per cent. of
 the total insurance carried.

"The reports on membership show an increase
 from year to year, but very much smaller than the
 splendid record and solid financial condition of
 the association warrants. I believe the associa-
 tion can now fully protect all existing contracts,
 but its mission is by no means ended, and, there-
 fore, I cannot too strongly impress on each in-
 dividual member that, in order to still further
 spread its beneficent influence, there is still neces-
 sity for vigorous work on the part of all, in bring-
 ing to the attention of every eligible persons the
 advantages and security offered, and inviting co-
 operation by membership.

"After due consideration, the executive com-
 mittee deemed the suggestions contained in the
 resolution offered at the last annual meeting to
 be impracticable." The resolution presented was
 as follows:

Under regulations, provision should be made for
 redemption of certificates, or changing same to annuities,
 for amalgamation and co-operation with other insurance
 and aid societies throughout the country which have
 for their object the care of the telegrapher in time of
 sickness, disability and death.

"The question of revision of the by-laws has
 also been given considerable attention, but the
 work is not yet completed, and the committee de-
 sires to defer its report on the subject. I desire

to thank the officers, members of the executive and auditing committees, and the agents for their hearty co-operation during the past year."

The reports of the secretary, the treasurer and the auditing committee were also read, all of which were ordered printed and distributed among the members.

The secretary's report shows that the total membership is 4,679 in the full grade, and 555 in the half grade, an increase of 20 in full grade and 24 in half grade.

The sum of \$15,000 was carried to the reserve fund, which now amounts to \$210,211.73

The amount received for interest during the past year on investments of the reserve fund and current deposits amount to \$11,118.41, equal to five per cent. on the entire assets of the association, and which, if needed, would provide for more than eleven deaths in the full grade or twenty-two deaths in the half grade.

The following were elected officers for the ensuing year: President, Belvidere Brooks; first vice-president, W. H. Young; second vice-president, Charles P. Bruch; secretary, M. J. O'Leary; treasurer, A. R. Brewer; executive committee, B. Brooks, W. C. Humstone, A. R. Brewer, James Merrihew, Charles P. Bruch, Joseph L. Edwards, G. H. Fearons and M. J. O'Leary, all of New York; E. J. Nally, Chicago; S. S. Garwood, Philadelphia; W. H. Young, Washington; auditing committee, E. B. Pillsbury, chairman, Boston; W. J. Dealy and Thomas E. Fleming, New York. Fifty full grade members and three half grade members died during the year, and \$59,000 in death claims was disbursed during the same period.

A pleasing feature of the meeting was the introduction by the president of Col. R. C. Clowry, president of the Western Union Telegraph Company, who was warmly greeted by the delegates present and who spent some time making and renewing acquaintances and commending the work engaged in.

The meeting closed with a stirring address from Secretary O'Leary who spoke in part as follows:

"It is fitting, perhaps, that we should occasionally review our annals and strive to learn from the history of the past some lessons which will be productive of good in the future. In looking over the report for this association, one of the most striking things is its comparatively slow growth. After more than a third of a century we still need about 300 additional members to bring the full grade membership up to five thousand, which, when attained, will be but a very small proportion of the vast number of people engaged in the telegraph business; and perhaps still more striking when the small cost, the undoubted security and solid financial condition of the association is considered."

Among those present were: W. D. Schram, Frank C. Coyle, B. Brooks, C. S. Pike, Thomas E. Fleming, Charles P. Bruch, Walter C. Humstone, W. J. Morrison, E. F. Howell, A. R. Brewer, M. J. O'Leary, J. B. Taltavall, William

Holmes, William L. Ives, R. W. Chapman, Lewis Dresdner, G. W. Logan, W. C. Burton, James Merrihew, W. J. Dealy, J. K. Calvert, A. M. Guest, F. D. Murphy, Geo. Roehm, R. G. Page, C. Hicks, W. J. Austin, C. M. Holmes, A. W. Wohlrebe, all of New York; W. H. Young, Washington, D. C.; W. E. Vanarsdale, S. S. Garwood, Philadelphia; E. B. Pillsbury, E. A. Smith, Boston, Mass.; H. L. Waterbury, Saratoga, N. Y.; C. T. Sydnor, Richmond, Va.; H. V. Shelly, Bridgeport, Conn.; J. B. Bertholf and I. D. Van Duzen, Jersey City, N. J.; Frank Richardson, Chicago, Ill.; Chas. C. Adams, Atlanta, Ga.; W. W. Hicklen, Cedar Rapids, Ia.; R. C. Baker, Peoria, Ill.; W. F. Barton, Atlanta, Ga.; W. P. Cline, Wilmington, N. C.; Frank Jaynes, San Francisco.

Cables Laid on Ground.

With the idea of overcoming the suspension of communication with the north from Vancouver, B. C., by the Government telegraph being broken by heavy snow falls, the Dominion Government will lay a cable over three ranges of mountains, strong enough to withstand whatever may fall upon it. E. A. Hawley, one of the foremen in charge of the construction in the north, who is now in Vancouver, said that sleet is the worst enemy of the telegraph lines in the North. The lines are being constantly broken and it is often very difficult to find the ends in the snow. Last winter the experiment was tried of laying a cable over the mountains, allowing it to be covered by the snow, and although it was not a complete success, it demonstrated the fact that with a proper wire there would be little trouble. A heavier and properly-insulated cable is now being prepared, of sufficient length to extend over three ranges of mountains, where the present trouble is experienced.

A New Use for Telegraph Wire.

The native women in the East African Protectorate have conceived a remarkable longing for telegraph wire, according to the *Electrical World*. They find that nothing so completely adorns their scantily-draped persons as a few yards of telegraph wire wound around their waists and serving as a girdle. The toilet of no fashionable belle is complete without it. They wind it around their bodies and permit it to remain, even during the hours of slumber. No telegraph wire as yet has been imported to meet this fashionable demand. The result is that the stocks of wire imported for the sole purpose of stringing on poles were depleted until the authorities became fully aware that telegraph wire was the rage of the hour. In the interests of telegraphy the white officials now keep their wire under lock and key and hold the tribal chiefs responsible for the integrity of the lines through their territories.

You can't afford to be without TELEGRAPH AGE.

W. J. Camp Becomes Electrical Engineer of the Canadian Pacific Railway Telegraphs.

Mr. W. J. Camp, electrician of the Canadian Pacific Railway telegraphs, at Montreal, Que., has been promoted to the position of electrical engineer, an office that places Mr. Camp in charge of all the electrical equipment of that telegraph system.



W. J. CAMP.

Electrical Engineer of the Canadian Pacific Railway Telegraphs.

Mr. Camp is not yet fifty years of age, having been born on April 22, 1855, at Oakville, Ont. He began his telegraphic career in the service of the Dominion Telegraph Company in his native town, in September, 1874. Of a studious nature, he early began the study of wire testing and switching, and soon after was given charge of the wires in his district. Later he was sent to Montreal as bookkeeper, and in 1876 was made manager of the office at Watertown, N. Y. After this he had a brief experience in the employ of railroads and of the Western Union Telegraph Company within the State of New York, but subsequently returned to the Dominion Telegraph Company at Montreal, where he was made night chief. In January, 1878, he became train despatcher for what is now a section of the Canadian Pacific Railroad, but later resumed his position of night chief of the Dominion Telegraph Company, from which he was promoted to be assistant day chief.

When the consolidation of the telegraph companies took place in Canada in 1881, Mr. Camp was retained by the Great North Western Telegraph Company until the strike of 1883, when he was obliged (like many others) to seek employment elsewhere, and obtained a place in a small way station of the Canadian Pacific Railroad. After remaining there a year he was appointed superintendent of the Holmes Electric Burglar Alarm Company, Montreal, from which he resigned to accept the position of electrician of the Canadian Pacific Railway Company's telegraph.

His promotion now to the higher post of electrical engineer further advances a man who, through faithfulness, study and close application to duty, has fairly earned the reward.

P. W. Snider, Superintendent, Atlantic Division, Canadian Pacific Railway Telegraphs.

P. Wellington Snider, who on November 1, became superintendent of the Atlantic division of the Canadian Pacific Railway Company's Telegraph, with headquarters at St. John, N. B., was born in the county of Halton, Ont., in July 1854.

Educated at the grammar schools in Paris and Brantford, Ont., he entered the service of the Dominion Telegraph Company at St. Catharines, Ont., and was employed by that company at various points in the Province of Ontario, and in the Parliament Buildings at Ottawa, until 1877. In that year the Dominion company extended their lines to the Maritime Provinces, and Mr. Snider was appointed manager of the St. John, N. B., office. In 1878 he was made section manager



P. W. SNIDER.

Superintendent, Atlantic Division, Canadian Pacific Railway Telegraphs.

for the Maritime Province district, and remained as such until the consolidation with the Western Union Telegraph Company in 1881, when he was appointed cashier of the St. John office of the latter, which position he held until January, 1889, when the Canadian Pacific opened their office at St. John and, Mr. Snider became the manager. The following year on the completion of the Canadian Pacific lines to Halifax and Canso, Mr. Snider was appointed circuit manager, having charge of the maintenance of lines in the Maritime Provinces. This position he has continued to hold until his appointment as superintendent of the newly created Atlantic Division.

The articles, "Some Points on Electricity," published regularly in TELEGRAPH AGE, are filled with practical information for the up-to-date operator. Send for a sample copy.

A Model Pennsylvania Railroad Telegraph Office.

One of the most important of the many improvements made by the Pennsylvania Railroad Company in and about the Broad Street Station general office building, Philadelphia, has been the establishment of a thoroughly equipped and up-to-date railroad telegraph office, which is declared by experts to be the largest, best equipped and handsomest office of the kind in the country. It



VIEW OF THE OPERATING ROOM.

Pennsylvania Railroad Telegraph Office, Philadelphia.

possesses all the advantages of the latest improved appliances in the telegraphic art, and is well located as to light, air and general convenience.

The new office has been installed in a room on the third floor of the Filbert street side of the building, facing the train shed. It is fifty by sixty feet, open upon three sides, and has nineteen windows.



VIEW OF THE SWITCHBOARD.

Pennsylvania Railroad Telegraph Office, Philadelphia.

The switchboard is of 100-wire capacity, divided into 25-wire sections, each section being lighted by an incandescent light. The case of the board is of antique oak, beautifully carved, with rolled plate glass, while the face, which is of solid brass, is covered with yellow lacquer, giving it a sort of dead finish. The board is equipped with a double bank of spring-jacks, with markers indicating each wire.

The distributing room back of the switchboard, larger by far than that of many of the larger commercial offices of the country, is a mass of cables and wires. Here is located the distributing rack, by means of which all of the wires are carried to their respective places on the switchboard. This rack, as well as the switchboard, is protected by fuses mounted on porcelain bases. Protection to the wires from different voltages is afforded by an improved resistance coil placed back of the rack, instead of the old system of resistance lamps. The current for the main line and local wires is generated by a large dynamo placed in a room overhead. The distributing room is also equipped with a time repeater, by which the time is repeated to all contiguous offices daily at 2 P. M.

In the operating room are eight octette tables of highly polished oak, with a capacity of 64 instruments. Of that number eight are quadruplex sets, working in different directions over the entire railroad system. To manipulate these instruments a force of 49 operators is required, while 24 messenger boys distribute the despatches received. The office is open day and night the year round, the operators working in shifts of eight hours, with the exception of the night men, of whom five are on duty for nine hours.

The business of the office is purely that of the messages of the executive, traffic and transportation departments, no train despatching being done. The average is 10,000 messages per day. The installation of machinery and equipment throughout was done by expert electricians, Michael Keily and E. L. Irving, attached to the staff of Superintendent of Telegraph, A. Keiser, and under his supervision.

The office is in charge of Joseph L. Osmond, chief operator, who has as his assistants M. F. Haughey, W. C. Marshall, J. L. Toy, R. C. Bartlev, W. S. Logan and R. J. Park, who have been selected from among the most expert telegraphers in the service of the company.

In establishing this office future growth of business was taken into consideration, and arrangements made for expanding without any interference with business.

Electricity and Earthworms.

Hugo Halberger, of Munich, Germany, has found that when an electric current is sent into the earth by thrusting one of the terminals into the ground, the worms and snails within a radius of six feet or more crawl out and get away from the affected area. Their behavior seemed to him to indicate that they were distressed by the electricity and he suggests that the remarkable effect of an electric current in stimulating the growth of plants may be really due to the extermination of parasites about their roots, rather than to a directly beneficial influence upon the plants themselves.

"Old Farmer Lawton."

The Rocky Mountain News, of Denver, Col., of November 1, prints the half-tone pictures of George E. Lawton, W. F. Drake and B. F. Bush, designating them as the oldest telegraphers of Colorado. Mr. Lawton is universally known as "Old Farmer Lawton," and as his numerous writings are so familiar to our readers, we reproduce his picture herewith together with what is printed in relation to him:

"History of myself? Now, my dear boys, you have got me. Our family tree has spread out pretty well all over New England for the past 300 years. Outside of the late General Lawton, I do not know of any of our ancestors that ever fought, bled and died for our country. A very great-grandfather, a colonel, I believe, did much toward stopping the practice of burning supposed witches around Salem, Mass., in the year 1692,



GEORGE E. LAWTON, OF DENVER, COL.

Who is more familiarly known as "Old Farmer Lawton," and who on November 2, reached his fiftieth birthday. It is a good reproduction minus the hoe and pitchfork that the Denver papers generally use when they attempt to get up something especially life like.

and a great-great-grandmother assisted materially in the revolutionary struggle by knitting socks and braiding palmleaf hats for the soldiers and making most excellent gingerbread on 'muster' days.

"Thirty years with the Western Union in Colorado, the greater part of that time right here in Denver, does not leave much margin to tell about any wonderful achievements. I have a slight recollection during the Civil War, while waiting at the depot for trains that brought the daily papers to the little town of Plymouth, Ill., where I sold them, of picking up a few dots and dashes that passed through an old-fashioned paper register. The night President Lincoln was assassinated I lost my head for the first, and I hope the last, time in my life. No sooner had Chicago informed Quincy of the greatest calamity that ever befell our Nation than I rushed for the public square, telling everyone I met, but nary a paper did I have

to back it up. My opponent in the paper business (now a prominent minister), who didn't pry into the secrets of the telegraph, quietly waited for the paper train and, naturally, got all the cream from that night's sale, and practically ran me out of the business.

"After a few years' schooling came my first love affair. A small wire stretched across the street between our houses carried many dear words from a very sweet girl, and I have always believed that my poor Morse in return had much to do in preventing me from being a married man at 15, as the girl's own papa cut the wire when he caught on to what was passing over that circuit.

"Almost disgusted at ever being able to make anything out of Professor Morse's great invention, my next adventure was at railroading, and my first position was brakeman on the Burlington out of Galesburg, Ill. But my love for the telegraph cost me this job after a very few trips, as the following note to Superintendent Hitchcock, and which I still retain in my possession, plainly shows:

"H. H. H.: Please give me another brakeman. This fellow Lawton is physically and morally all right, but he has a bug about hanging around telegraph offices when he should be out on a boxcar. He also has an old telegraph key attached to the top of my caboose that seems to prevent him from gauging the speed of our train. He let us down the Quincy hill on our last trip with fifteen loads of cattle at a speed that caused some of the Texas steers to faint and Engineer Sadler's hair to turn gray.

(Signed) "SAMUEL RATHBURN,
"Conductor."

"The good, but stern, old superintendent bluntly informed me that I was fired. I acknowledged my guilt, but asked him if he could not substitute some other word for 'fired.' This evidently amused him, as he immediately gave me a position as helper for one of the outside agents. With many thanks I accepted his kind offer of a jump from \$65 to \$30 a month, and in a few weeks the kind agent left me in charge, drawing his \$90 per month, while he took a long vacation. The very first train order I received was for the conductor who had been the means of having me fired. After patting me on the shoulder, he said:

"George, you are the coolest fellow I ever accepted a train order from. I do not feel nervous as I frequently do after watching some of the older agents copying them from the tape."

"Conductor Rathburn proved a good friend, and never missed an opportunity to recommend me for a higher position. But the sad sequel of our first meeting thirty-five years ago ended here in Denver four years since, when poor Rathburn dropped dead on the street almost in front of our office, at which time he was the oldest passenger conductor on the Denver and Rio Grande, having drifted West a few years after I did.

"My experiences on the Atchison, Topeka and Santa Fe, when that company was struggling with the Indians for a right-of-way through the wilds of Kansas, I shall have to omit, as my duties in the superintendent's office at Topeka were so

light in comparison to my salary my conscience bothers me even to this late day when I allow myself to think of it, but if old "Si" Prime was only alive, or if Charlie Dyer, late general superintendent of the Colorado and Southern, was not at present in Chicago, either might tell you all about it. Mr. Dyer was the operator on the front and came pretty nearly earning his salary in the mix-ups he and the graders had with the original owners of the soil.

"While, perhaps, not a practical farmer, it's a heap lot of comfort for a man my age, now 50, to know that he owns a fairly good slice of Uncle Sam's domain, and I feel very grateful to the company that has given me an opportunity to obtain the same, and in my religious moments it is not always quite clear to me that I do not owe the Western Union something more than thanks and gratitude for these many years of employment."

The Alaska Cable.

Alaska will soon be connected with the outside world by a cable of American manufacture, embodying the newest and best devices, over American soil and the bottom of the Pacific.

The last session of Congress appropriated the sum of \$485,000 for the purpose of building an Alaskan cable from Seattle to Sitka and Juneau, without passing over Canadian territory. This gigantic enterprise is under the personal direction of Gen. A. W. Greely, who gave his personal attention to the work. It is being done by the United States signal corps on board the cable ship *Burnside*. While in service in the Philippines this ship laid two thousand miles of inter-island cables under the control of the United States signal corps. She came to Sitka, Alaska, about the first of July, and was engaged in making extensive repairs on the existing cable now laid between Skagway and Juneau, Alaska. This work was done under the direction of Capt. Edgar Russell, of the United States signal corps. The cable was originally laid by improvised means in great haste to connect the seat of government of southeastern Alaska with the Canadian telegraph land lines at Skagway. It has now been put into perfect condition, and there is no better cable in the world. It connects the military post at Haines, Alaska, on the Lynn Canal, with the Canadian system, and after the ocean cable is laid it will give an all-American connection with Juneau commanding the gateways leading to the Yukon Valley, at a point where the recent boundary dispute between Canada and the United States has called for a strategic military point of vital importance.

The *Burnside* is under the immediate command of Gen. James Allan, of the United States signal corps, assisted by Capts. Edgar Russell, George C. Brunnell and Charles Chandler, of the same branch of the service. There are on board the following civilian electrical engineers: Henry

Winter, cable engineer; David Lynch, cable electrician; Frederick Mumma, assistant cable electrician; William Edgar, cable instrument expert. There are sixteen enlisted men of the signal corps conducting the work of the ship, the laying of the cable and its operation. She carries a corps of petty warrant officers, who are all Americans. Besides these there is a crew of eighty or ninety Filipinos, constituting the ship's company and the cable laborers.

After repairing the existing cable, the *Burnside* proceeded to Seattle, where she received about six hundred miles of ocean cable. The night before reaching Juneau she met her first critical experience in Alaskan waters. She ran into a low-lying, submerged iceberg, which could not be detected by the watch. Her injury proved not to be serious, but in order to lighten her load, she laid fifty miles of cable on her way from Sum Dum, Alaska, to Juneau, thus losing no time, as this cable was intended to be laid on this course.

The cost to the Government of the present line is approximately \$450,000 for the cable, \$75,000 for expense of laying, besides the daily cost of the *Burnside*, which is about \$400 per day.

When the link is laid between Sitka and the port of Valdez, the United States will possess an all-American line independent of any connection with the Canadian land system. There is already existent in the Yukon territory a system which connects all the American possessions of that region. There is now in Alaska a line from St. Michaels to Gibbon, from Gibbon up the Tanana to Ketchum Stock, and from Ketchum Stock northeast to Eagle and southwest to Valdez. In order to make connection with Nome it will be necessary to install a wireless system across Norton Sound from St. Michaels to Nome, as the cable experimentally laid between those two points is not able to withstand the ice-pack in the northern ocean.

When the new cable is opened the cost of messages will be ten cents per word and no minimum other than the cable custom of at least two words. There will be a flat uniform rate for all service except press rates, which though not yet settled, will probably be about half the cost of commercial messages.

The present system is not expected to pay more than half the running expenses, it being laid primarily as a military necessity and in the next place as of great benefit to the community in building up commercial intercourse.

The link between Sitka and Valdez is the only one necessary to complete this Alaskan cable enterprise, and the present Congress will be asked to appropriate sufficient money to cover the cost of construction.

Women are now being substituted for men in the Italian postal service. Signor Gallmberti, the Minister of Posts and Telegraphs, is responsible for the change.

Sketches of Some of the Champions at the Philadelphia Tournament.

GEORGE W. CONKLING, OF NEW YORK.

George W. Conkling, of New York, one of the best all-around telegraphers in the country, and who was the winner of a number of prizes at the recent tournament at Philadelphia, is manager



GEORGE W. CONKLING, OF NEW YORK.

of the sales department of the Yetman Transmitting Typewriter, New York. He was born at Mountindale, Sullivan County, New York, December 22, 1871. At the age of 15 he entered the service of the West Shore Railroad Company at the New Durham, N. J., yard and round house terminal, as train crew call boy and messenger. Nine months later young Conkling had mastered the dots and dashes sufficiently to be recognized by the superintendent of telegraph, S. S. Bogart, and was given his first position as a night operator at East Hackensack, N. J. His promotion with that company was rapid. He soon became proficient as an operator and in less than three years from the time he took his first office, in the fall of 1890, was working the first Boston quadruplex in the old Postal office at 187 Broadway, where he turned out a pen copy that was fast and beautiful. About this time, the typewriter coming into general telegraphic use, he took advantage of this new device for copying messages and in a short time was working his wire with a "mill" and studying the Phillips Code, his first step toward securing a position with a press association. Conkling gained considerable experience in newspaper work by reason of assignments to newspaper offices. Early in 1892 he was employed by The United Press and assigned to copy the night report on the first south wire at Newark, N. J. Here he remained permanently, except for occasional extra work at the New York office, until the absorption of that association in 1897, when he went with The Associated Press at New York.

Six months later he again enlisted with the Postal Company at the New York Journal office, nights. In February, 1898, he was working the Chicago Inter-Ocean leased wire, which was started at that time and where he was paid the highest salary for exclusive wire work. At that time this wire was considered the fastest and heaviest circuit in the United States, and Conkling was accredited with doing good work. In May, 1898, he won the first prize for code sending at the New York tournament at Madison Square Garden, and was commended for the beauty and accuracy of his Morse and the fine judgement displayed in the handling of the code. In June, 1898, he entered the broker service, where with little intermission he continued for several years. During this time he used a typewriter for copying orders, quotations, messages and gossip and was probably the only man in the broker service who realized that the typewriter could be made use of for everything on a broker wire, no matter how heavy the business. He was at this time a touch typewriter operator. In July 1902, he accepted a position with Mr. Yetman.

Mr. Conkling is one of the few who has had an education in all branches of the telegraph service and is to be numbered among those operators possessed of more than ordinary skill in the profession.

WILLIAM M. GIBSON, OF NEW YORK.

William M. Gibson, of New York, the winner of the first prize and Carnegie medal in the class for the best all-around operator, at the Philadelphia telegraph tournament, has earned a deserved



WILLIAM M. GIBSON, OF NEW YORK.

high position as an AI operator. He was born at Quebec, Canada, on May 2, 1863. He entered the employ of the Montreal Telegraph Company, Montreal, in 1874, where he learned telegraphy, remaining with the company until 1879. He then went to Boston for the Western Union, where he worked for about a year. Afterwards he went

back to Canada for a short time, and in 1882 returned to this country, locating in New York. He was employed at 195 Broadway until 1883, when he found employment with a broker, with whom he continued until 1890. In that year he secured a position with The United Press, and was with that organization up to the time of its disbandment in 1897. Since that time he has been with a stock broker in this city. He also does extra work at night for the Postal Telegraph-Cable Company. Mr. Gibson has taken part in and won first and other prizes in many previous tournaments, at New York, in 1898, carrying off the championship prize and the second prize in the code class.

HARVEY WILLIAMS, OF PHILADELPHIA.

Harvey Williams, of Philadelphia, who won the first prize of \$100 in the broker contest and won the first prize of the championship of Amer-



HARVEY WILLIAMS, OF PHILADELPHIA.

ica class at the recent telegraphic tournament held in that city, has shown remarkable aptitude as a fast and accurate operator. At the conclusion of the tournament his excellent work received deserved encomium from press and people. He was born at Mauch Chunk, Pa., November 21, 1866, and commenced his telegraphic career as a messenger in his native town when thirteen years of age. He became a Western Union operator at Wilkesbarre in 1881. Subsequently he entered a broker's office, first at Mauch Chunk, and afterwards at Scranton. After this he was employed by the Central Railroad of New Jersey, thence going to Philadelphia in the employ of the Western Union, later going with the Postal. By the latter company his assignments were mostly to different newspaper offices. Mr. Williams is now an operator with the banking house of Ervin and Company, Philadelphia, one of the members of which was himself a former operator, and to whose suggestion Mr. Williams entered the tournament as a contestant. His fine success

achieved on that occasion has been a source of much satisfaction to him, and he has announced himself as a future tournament competitor, his ambition being to capture the Carnegie medal.

Assassination of Railroad Operators in Pennsylvania.

The position of railroad telegraph operators in these days is certainly not one to be ardently sought after. Every day of late we are in receipt of information of railroad operators being murdered, robbed or held up by masked men. The situation has become so serious along some of the railroads that the operators and station agents have been requested to arm and defend themselves, and to not hesitate to use their revolvers whenever they felt that their lives were in danger. Outlaws of this description are particularly numerous in the mountains of Pennsylvania where many telegraph offices have recently been robbed, safes blown open the operators having narrow escapes with their lives.

W. H. Clendenen, a telegraph operator at Brown, Penn., on the Beech Creek Division of the New York Central Railway, was found dead in the telegraph tower shortly after 7 o'clock on the evening of November 19. At 6.50 o'clock the operator at Oak Grove, Penn., on the same road, received this message from Clendenen:

"Send switch engine quick to me, I am being murdered by"—

The wire opened and not another word came.

A switch engine soon reached Brown. The body was found lying under the desk, the head crushed. Robbery was apparently the motive, for the operator's watch and money were missing.

Clendenen was twenty-eight years old, and unmarried. It is supposed that he recognized his assailant, and was about to wire his name, when his message was cut off by death. The entire section where this murder occurred has been thoroughly aroused over the atrocious deed, and every effort is being made to bring the murderer to justice. The funeral of Clendenen was attended by thousands of sympathising people, including several hundred telegraphers.

William Kelsey, a railroad operator at Charleroi, Pa., who had been married but a few weeks, was shot and killed on November 18 by a desperado on the platform of the railroad station, at that place. The people of the town divided themselves into squads and started to scour the country in pursuit of the murderer.

At midnight of November 20, another of these remarkable series of attacks on night telegraph operators was made. Thomas Dalton, who has charge of the station at Girardville on the Reading Railway, kept his door locked and himself armed after hearing of the numerous hold-ups in that vicinity of Pennsylvania. At midnight two masked men presented themselves at the door and knocked. When Dalton asked who was there, they replied by giving the name of a well known

operator on the line. When the door was thrown open the men rushed in, knocked Dalton down and while one guarded him the other rifled the money drawer. They ordered him to open the safe, but he did not know the combination and could not do it. Before leaving, the desperadoes locked Dalton into a closet, with the warning that he would be shot if he left it. Two men have been arrested charged with the crime and held for court.

At one o'clock on the morning of November 20 a masked robber entered the Reading station at Allenwood, Pa., and forced Murrel Hafer, the night operator to open the money drawer. He then ordered the operator to cut out all the telegraph instruments, so that no message could be sent. The robber evidently understood telegraphy, for, when Hafer tried to send a message to Tamaqua to the trainmaster's office the robber knocked him down.

Hafer had ticked off three words, "I need help" —, when the robber exclaimed, "Here, none of that!" and struck him. Then he bound and gagged him and chloroformed him. A passenger, who was asleep in the waiting room, was also chloroformed. The three words received at Tamaqua startled the despatcher. The crew of a freight train at Montgomery was directed to detach the locomotive and proceed to Allenwood. The crew found Hafer and the passenger unconscious on the floor.

Investigations show that a desperate gang of outlaws, who are believed to have their rendezvous somewhere in the lonely mountain passes along the Shamokin divisions of the great railroads, were the perpetrators of the murder at Brown's tower and the robberies at Allenwood and Girardville and at other places. All the trainmen and engineers are being armed, and guards have been stationed at the signal towers and stations. Squads of the companies' detectives and policemen and posses of trainmen are searching the mountains. The railroad officials have issued orders that no expense be spared in the effort to capture the gang. The leader of the outlaws is believed to be a former railroad telegrapher.

William Skinner, who killed William Bolivar, a railroad operator, at Greensburg, Pa., last August, has been found guilty of manslaughter and will suffer the penalty of the law.

A Welcome Exchange.

An always welcome newspaper exchange to our office table is the "Civil Service Review," a mid-monthly journal published at Cape Town, Cape Colony, Africa. It is devoted to all branches of the service and fills an important place in South African journalism. It is a well printed, well conducted paper, and keeps in touch with the telegraph, which in that country is maintained by the Government.

The land lines in San Domingo are once more interrupted, another revolution being in progress.

LETTERS FROM OUR AGENTS.

[Advertising will be accepted to appear in this department at the rate of five cents a word, estimating eight words to the line, announcements to be enclosed with a border and printed under the name of the place of the advertiser. The special local value attached to advertising of this character will be apparent. Our agents are authorized to solicit advertisements for these columns, and further information on this subject may be obtained on application.

The current information of any office will, if carefully chronicled, furnish a welcome digest of news that will be read with pleasure and satisfaction by thousands, and this limit should constitute the legitimate contents of all letters. And we wish that our correspondents would avoid the too frequent habit, at all times a bad one, of abbreviating words in writing. This is a peculiarity among telegraphers, we know, but what may be plain to the writer, and for local interpretation, is usually a mystery to the editor, and is apt to lead to error in the printed statement.]

PHILADELPHIA, PA.

My Motto—Honorable Dealing.

I AM NO "KNOCKER." I never have, I never shall "knock" any typewriter. There are several very good makes of typewriters now on the market, but if you value my opinion as to which is the **BEST** for all kinds of telegraph work I unhesitatingly recommend the **FAY-SHOLES NO. 6**. Please apply to me direct for folder, booklet, special price and terms to telegraphers. Club now forming. "Mills" of any old make taken in exchange. Remodeled Remington and Smith machines fitted with reversible rolls \$45.00, guaranteed. Easy monthly payments; all makes rented \$3 per month.

D. A. Mahoney, Special Representative, Western Union Telegraph Company, Philadelphia.

WESTERN UNION.

The final and most enjoyable event, the only event that did not appear on the tournament programme, took place on the evening of November 21 in the shape of a grand banquet, given in honor of and to commemorate the success of the recent tournament. It was a fitting tribute to the many worthy gentlemen who composed the executive and other hard working committees, all of whom were invited to participate. Many, however, were unable to be present and sent regrets. That the banquet was a success from every point of view goes without saying, and those who were fortunate enough to be present will long remember the occasion. The banquet room, which was large and spacious, was brilliantly illuminated and handsomely decorated. The menu was of the finest, one that would tickle the palate of epicures. The menu card, which was gotten up as a sou-

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TELEGRAPH AGE.

Any Electrical or Telegraph book published for sale by Telegraph Age, 253 Broadway, New York.

venir of the occasion, was a handsome piece of work, and was greatly appreciated. Mr. C. A. Stimpson, chairman of the executive committee, was the toastmaster and acquitted himself admirably in announcing the toasts and the responding speakers. They were as follows:

"The Commercial Telegraph," L. Lemon; "Our Tournament," C. B. Wood; "The Railroad Telegraph," Andrew Keiser; "Our Executive Committee," W. W. Donnelly; "The Fire Alarm Telegraph," John C. Sager; "The Telephone," S. S. Garwood; "Old Timers," Col. W. B. Wilson, and "Our Brokers," A. S. Weir.

The several subjects were gracefully handled and the speakers received close attention.

Those present were as follows:

L. Lemon, C. M. Lewis, S. S. Garwood, C. E. Wilson, F. M. Griffin, J. C. Sager, Andrew Keiser, S. W. Graham, G. W. Wood, Daniel Good, Joseph Green, I. D. Maize, G. G. Glenn, W. T. Westbrook, F. G. Lamb, Col. W. B. Wilson, John Wintrup, C. B. Wood, H. W. Hetzel, C. A. Stimpson, W. S. Sullivan, F. E. Maize, A. S. Weir, E. L. Irving, R. C. Murray, Jr., C. E. Bagley, J. W. Benckers, J. J. Mishler and A. S. Crowder.

Miss Clara Grimley has resigned to accept a position at Pittsburg, Pa.

W. L. Sullenberger, manager at Lancaster, Pa., was a recent visitor.

H. A. Given, formerly of this office, and now located at Steelton, Pa., was another visitor.

POSTAL.

The annual dinner of the Magnetic Club at New York attracted the attention and presence of our chief operator, C. A. Stimpson, and Traffic Chief Geo. W. Dunn.

Three months in Pittsburg was sufficient for R. P. Stoddard, who has resumed a place in our midst.

We are glad to see Robert Sterling back again. Typhoid fever kept him home for a long time.

Electrician D. H. Gage, Jr., has returned from York and Williamsport, Pa., where he installed two of the prettiest offices in the State. Mr. Geo. E. Sornberger, of Altoona, Pa., has been appointed manager at Williamsport. His successor at Altoona is Evan G. Protho.

Mr. Frank Von Neida, of Harrisburg, Pa., has been appointed manager at Atlantic City, N. J., vice Geo. W. Phillips, who has been assigned to other duties.

After a busy summer season on special burglar alarm service, Frank Burns has resumed the management of the 10th district American District Telegraph office at 8th and Wood streets.

Manager Ed. Greene, of the Conshohocken, Pa., office, exhibited evidences of a successful gunning trip in the wilds of Carbon County.

QUEBEC, GREAT NORTH WESTERN.

George Alexander and James Dunn have resigned and gone West.

Business this fall has dropped off very much.

MONTREAL, QUE., GREAT NORTH WESTERN.

Charles Noble has returned from his vacation much benefitted by needed rest.

W. D. Scott, assistant traffic chief, is absent on his vacation.

Business has fallen off considerably of late, and indications point towards a very dull winter.

MILWAUKEE, WIS., WESTERN UNION.

Oscar Meinecke, a rising young telegrapher of this office, died at his home in this city, of consumption, on October 23. Mr. Meinecke rose from the position of messenger to that of operator through careful attention to his work and an earnest desire to advance in the profession of his choice. He was a popular young man with his co-employees, and they extend their sympathy to the bereaved parents and brother.

NEW YORK CITY.

If you wish to buy, or rent a good typewriter, see me, or send for my new illustrated circular and prices. Amos L. Bougher, Western Union, New York.

WESTERN UNION.

In these days few if any resignations are handed in, and no appointments to the regular or the extra force are being made, all of which goes to prove that the telegraph business has assumed its normal winter condition and will probably so remain until about the middle of January, when a large number of the members of the force will be ordered to the various winter resorts to take care of the business of the company at those points during the season.

Mr. Ralph Bristol, of the general superintendent's office, has returned from Chicago where he spent Thanksgiving day with friends.

Mr. John Simmonds, assistant manager of the New York office, has resigned to accept a position with his brother who is a successful New York broker. Mr. Simmonds has the well wishes of a host of friends in the telegraph service with whom he has been associated for many years. He has been a telegrapher for thirty years, having begun his career as a messenger boy. By faithful attention to duty he was promoted through the various grades until he was made assistant to Manager H. W. Hamblin a year and a half ago. Mr. B. H. Reynolds succeeds Mr. Simmonds.

Mr. Martin Durivan, a chief operator in this office, who has been acting in a similar capacity at Long Branch, N. J., during the past season, is expected to return to the office within a few days.

Mr. R. W. Martin, better known as "Bob" Martin, one of the best all around telegraphers in the United States, is absent on account of sickness. His friends hope for his speedy recovery.

Mr. R. J. Murphy, of the operating department and secretary of the Magnetic Club, is enjoying a well-earned vacation.

A reception was tendered to the Telegraphers' Social and Dramatic Club, on Friday evening,

November 13, at William's dancing hall, Brooklyn, by Mr. M. Walton Jones, who is connected with the Long Island Railroad Company. It was a very social and enjoyable affair. Among those who attended were: Dr. and Mrs. H. W. Jones; the Misses Jones; Mr. F. A. Turner and Miss N. M. Voorhees; Mr. W. J. Keegan and Miss May Brady; Mr. Joseph Fitzgerald and the Misses K. and M. Weldon; Mr. Wm. McNamara and Miss Frankie Gannon; Mr. J. O'Connell and Miss E. M. Colwell, Miss Webster, Mr. Evans, Miss Kitty Donnelly, Miss Durney, Messrs. Gormally, Cussard, Monahan and Creighton; Mr. Chas. Monnett and Miss Fox; Mr. Solman and lady; Mr. J. McCarthy and Miss Bessie McCarthy; Miss Lillie Gopman; Mr. Finn and Misses A. A. and E. C. Finn; Misses May Foley, Lillie Byrnes, Anna Byrnes; Francis Ryan, Miss May O'Connell, F. J. Sheridan, Mr. Robert Irwin, and Miss Flossie Compton; Florence Gallagher, Agnes Sullivan, and many others.

Mr. F. M. McClintic, the well known champion telegrapher, has concluded to return to Memphis, Tenn., where he will represent a Mexican mining concern as their southern representative. During his stay of three weeks here Mr. McClintic made many friends all of whom regret his leaving the city. While in New York Mr. McClintic received several flattering offers, including one from the Western Union Company, but the mining proposition seemed the most attractive and for sometime to come, at least, Mr. McClintic will reside at Memphis.

Mr. Richard Walsh and Miss Bessie McCartney, both of this office, were married on November 25, at St. Ambrose Church, Brooklyn. A large number of the telegraphic friends of the couple were present, and the gifts were both numerous and handsome. Mr. and Mrs. Walsh have gone on an extended wedding tour South.

POSTAL.

The members of the New York Local, No. 16, Commercial Telegraphers' Union of America, held their first annual entertainment and ball on November 13, at the Amsterdam Opera House. A first class vaudeville programme was offered and the ball was declared to be a great success. Among those who attended were many prominent members of the fraternity.

Mr. M. M. Davis, traffic manager of the company, has returned to New York after an extended trip to the Pacific Coast, and elsewhere, for the benefit of the service.

The extension of the gallery to give needed room is now being pushed forward and the operating department itself is being extended so that when the improvements are completed the space devoted to the operating room will take in the entire 12th floor.

The coat room on the mezzanine floor is also being enlarged so as to give additional needed space. When these improvements have been finished the New York office will have been brought up to date in every particular.

Mr. J. F. Skirrow, formerly assistant manager of the operating department, now electrician of the Eastern division, has several new offices in course of construction in various parts of the division. The new main office at Boston will be a particularly handsome and up-to-date affair. The new office at Hartford, Conn., is about ready for occupancy. It is located on Main street, and Manager R. P. Martin is satisfied that his office will be ample to handle the growing business of the company for many years to come, and at the same time convenient and comfortable for the employees. A new main office will be constructed at Syracuse, N. Y., while extensive alterations in the main office at Philadelphia will keep Mr. Skirrow busy for some time to come. Mr. Skirrow, however, will find time on the evening of December 9 to take the third degree in masonry at Hope Lodge, East Orange, N. J., and many of his telegraph masonic friends will be present to witness the "raising ceremonies."

Something About the Latest Books.

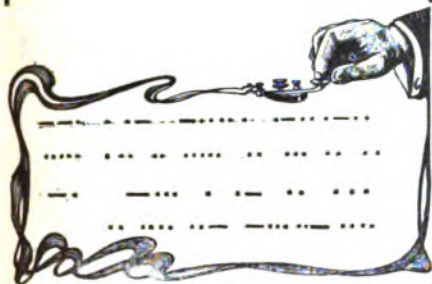
Maver's "American Telegraphy and Encyclopedia of the Telegraph," amplified to the extent of about 100,000 words, with many new diagrams, and in a new dress, is now ready for delivery. The book contains over 656 pages and nearly 500 diagrams. Among the new features of this latest edition are sections on wireless telegraphy, the Ghegan and Atkinson repeaters, the double current, single wire repeater and open circuit repeaters, used in Great Britain and elsewhere; Brown's cable relay and repeater; the Roberson quadruplex and British post office quadruplex; the Buckingham printer, the telautograph, Gray's harmonic telegraph, the United States Signal Corps station and field "kits"; the Delany and the Pollak-Virag automatic telegraph systems; motor-operated semaphores; Miller locomotive cab signal system, and numerous other additions. This work also contains within its covers what would be considered, if published separately, practically complete books on electrical testing, galvanometers, batteries and dynamo machines, submarine telegraphy, automatic telegraphy, military telegraph signaling, railroad block signaling, etc. From this standpoint "American Telegraphy," may be considered as equivalent to more than twenty-five books in one. It is, in short, a complete work in telegraph engineering and as such is used as a text book in many of the leading universities and colleges in this country.

The price of this work is five dollars, which includes the prepayment of express charges to any address in the world. Send orders to J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

In a recent letter occurs the following:

"It seems almost impossible to conceive that operators who have been in the telegraph business for years do not know how to service messages and who, in consequence, are constantly being criticized by officials about their forms of

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TELEGRAPH
OPERATOR
CAN
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Ask us to send it to you, together with our free, handsome catalog.

The Fox Typewriter is the best mill in the market.

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Will last longer than any other typewriter and has more desirable features.

A Fox has no speed limit. Don't use a machine that handicaps you in receiving messages by poor action, piling letters, uncertain tension, etc.

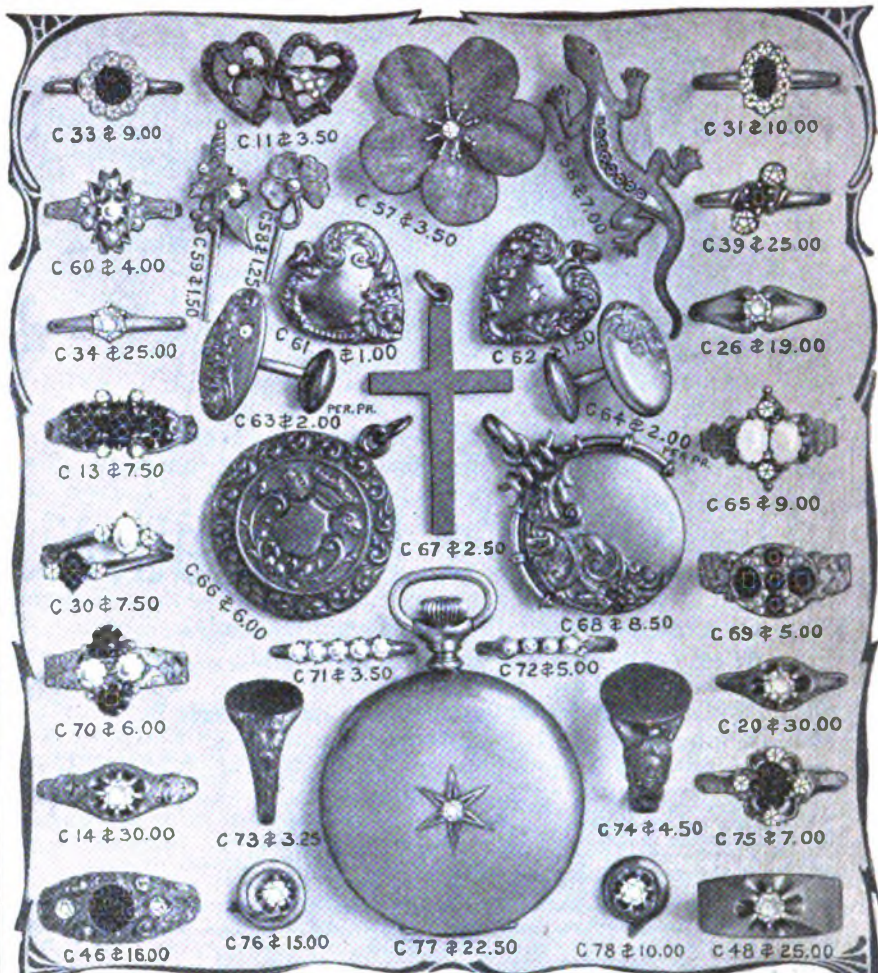
Besides, it takes only a 2½ ounce pressure on a key to print it legibly, instead of 12 to 14 ounce pressure as on other machines.

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The book tells all.

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If you but write.

And further, I will send the name of a druggist near
you who will let you take six bottles of my remedy,

Dr. Shoop's Restorative

On a month's trial. If it succeeds, the cost to you is
\$5.50. If it fails, the druggist will bill the cost to me.

Don't Wait Until You Are Worse.

Taken in time, the suffering of this little
one would have been prevented. Her
mother writes:

"Two years ago my little girl was sick
continuously for six months. We tried
many doctors but they failed, yet it took
only two bottles of your remedy to cure
her, and she has remained cured. You can
tell others of this cure if you so desire.

Mrs. C. H. Avery, Rockdale, N. Y."

The wife of Omer Andrus of Bayou Chi-
cat, La., had been sick for 20 years. For
eight years could do practically no work.
He writes:

"When she first started taking the Res-
torative she barely weighed 90 pounds;
now she weighs 135, and is easily able to do
all her housework."

J. G. Billingley of Thomasville, Ga., for
three years has been crippled with disease.
Now he is well. He writes:

"I spent \$250.00 for other medicines and
the \$3.00 I have spent with you have done
me more good than all the rest."

And these are only three from over 65,000
similar cases. Such letters—many of them
—come every day to me.

How much serious illness the Restorative
has prevented I have no means of knowing,
for the slightly ill and the indisposed
simply get a bottle or two of their druggist,
are cured and I never hear from them.

But of 600,000 sick ones—seriously sick,
mind you—who asked for my guarantee, 39
out of 40 have paid.

If I can succeed in cases like these—fail
but one time in 40 in diseases deep-seated
and chronic, isn't it certain I can cure the
slightly ill?

All You Need Do.

Simply write me—that is all.—Tell me
the book you need. The offer I make may
sound extravagant. But it isn't. It would
mean bankruptcy to me, though, were it
not for my discovery. That discovery—
the treatment of the inside nerves—taught
me a way to cure, I do not doctor the
mere organs. I doctor the nerves that
operate them—that give them strength and
power.

And failures are seldom—so seldom that
I make this offer gladly, freely—so that
those who might doubt may learn without
risk.

Tell of it, please, to some sick friend. Or
send me his name. That's but a trifle—a
minute's time—a postal. He is your friend.
You can help him. My way may be the
only way to get well.

If I, a stranger, will do this for him, you
should at least write.

Drop me a postal to-day.

Simply state Book 1 on Dyspepsia,
which book you Book 2 on the Heart
want and address Book 3 on the Kidneys
Dr. Shoop, Book 4 for Women
Box 3247 Racine, Wis. Book 5 for Men (sealed)
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messages employed and principles of their own adopted in handling business. Along the main line of a northwestern railroad, operators with good peg switchboards when called upon to make a patch, have been known to pull out the wires from the board and splice them instead of using the boards for the purpose. I recently heard a man on the Rock Island system, who has been in the service twenty years, make the letter j for a comma. When the receiver broke him on it, he repeated it at least three times, and when challenged said that the j was meant for a comma, which he had forgotten how to send.

"While in Boston, Mass., recently, I learned of some branch office managers who did not know how to check an extra word message or how to forward messages. When we stop to consider that nearly all the members of the profession generally learn to telegraph in a railroad station or a branch office, and are hurried off to fill a position before their education in the art is anywhere near complete, their future work is accomplished in accordance with their own faulty views which, as time lapses, become so deep rooted, that they come to believe their own way to be the best. It is no wonder countless failures are made.

"With a steerer as to how telegraph work should be done operators will gradually fall into right methods, but they need an authority to guide them to a mastery of their work, other than miles of red tape from officials and cutting remarks from older heads, which do not correct but only anger."

"When it is remembered that all the information necessary to thoroughly inform an operator as to his business is contained in the Twentieth Century Manual of Railway and Commercial Telegraphy, it seems surprising that comparatively so few copies of the work find their way among the Fraternity.

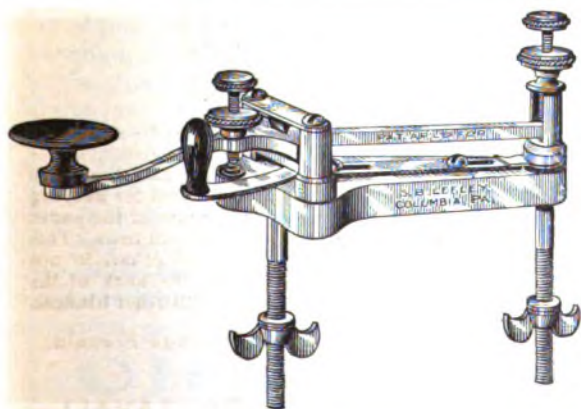
"Orders for this book, accompanied by an express or money order covering the cost, should be addressed to J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

We desire to say in response to a large number of inquiries, which continue to be received from

day to day from all over the country, that the forthcoming revised edition of "Pocket Edition of Diagrams and Complete Information for Telegraph Engineers and Students," is on the press and will be ready now very shortly. We ask our friends to be a little patient; they will soon receive their volumes ordered. When the work was first issued, less than a year and a half ago, it was of course complete in statement up to that time; but so much that is new in device has since been added in the telegraphic field that a thorough revision of the book with large additions thereto, both of text and illustration, was decided upon, for TELEGRAPH AGE was desirous that the telegraph profession the world over should still continue to have at complete command the very latest information respecting every phase and detail of telegraphy in theory, practice and apparatus, something that the earlier editions of this work supplied for the first time in the history of the telegraph. So many look to this source and this journal for such knowledge that there was only one course open for this paper to adopt.

Mr. Jones has done his revisionary work with conspicuous ability. Our friends when they receive the new volume cannot fail to be delighted and thoroughly satisfied with it. It will appear in the old form with the same style of binding, but with its one hundred or more new pages will be somewhat more bulky in size, yet the price will still remain the same, namely, \$1.50. The standard character of the work, acknowledged as such in every land, is more than maintained in the new edition, for it embodies the finest study and presentation of the complex subject of the tele-

A few bound copies on hand of first 320 pages of American Telegraphy, all that relates to Morse telegraphy, originally intended as volume one, sent postpaid \$1.50. "American Telegraphy and Encyclopedia of the Telegraph," 1903 edition. Postpaid \$5 Send 8 cents in stamps for specimen pages and diagrams. Agents wanted. Maver Publishing Co., 120 Liberty street, New York.



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graph ever attempted. As before remarked this is because the author, Mr. Jones, is a telegrapher himself, an engineer of high repute in the service, a man active in his profession, who deals with his subject not from the standpoint of the theorist, as with most writers, but from the plain, every day practical side gained by the experience of personal contact, imparting to other telegraphers the exact kind of information that is desired because of its helpful and instructive nature. The book will be sent, express charges prepaid, to any address. Orders should be sent to J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Obituary.

M. P. Burns, aged thirty-one years, for many years operator at the Western Union Telegraph office in Gardiner, Mass., died on November 2.

Homer K. Lyda, foreman of the Western Union Telegraph Company, at Albany, N. Y., and a native of Macon City, Mo., died on November 16.

Mrs. Catherine R. Ludwig, aged ninety-one years, died November 16 at Watsontown, Pa. She was the mother of D. J. Ludwig, superintendent at Brooklyn, N. Y., of the Stock Quotation Telegraph Company, and of E. F. and L. A. Ludwig.

Mrs. Caroline Estabrook, widow of the late Experience Estabrook, of Nebraska, died November 20 in the home of her son-in-law, Col. Robert C. Clowry, president of the Western Union Telegraph Company, at Elberon, N. J. She was eighty-one years old, and was a daughter of James P. Maxwell, a pioneer of Wisconsin. She married Experience Estabrook, who was Attorney-General of Wisconsin and later became Attorney-General of the Territory of Nebraska. Her daughter, who married Col. Clowry, died several years ago. Mrs. Estabrook leaves one son, Henry D. Estabrook, who is solicitor for the Western Union. The funeral was held in Omaha, Neb., November 24, whither the remains were accompanied by Col. R. C. Clowry, H. D. Estabrook and wife, Mrs. Karl G. Roebbling and F. J. Scherrer.

IN MEMORIAM OF RODERICK H. WEINY.

All that was mortal of Roderick H. Weiny, whose death was announced in the preceding issue of TELEGRAPH AGE, was buried at Newark, Ohio, on November 5. There was a final funeral service, in Newark, and the last loving tribute to Mr. Weiny's friends could pay to his memory came in a wealth of flowers, both from those who knew him, in Newark, in earlier years, and from his late associates in New York.

In Mr. Weiny's death a loss has been sustained that can never be quite repaired. He was not only a very able and useful man, but he was kind hearted and helpful to all in whatever walk of life he met them. The various railroad companies, The United Press and the Telephone Company, by which he was employed at the time of

his death—all of his employers, at all times, felt that he was thoroughly in earnest and that he added to his surpassing integrity of purpose a degree of capability that rendered him a most valuable and resourceful employee. But aside from this he was a man in every sense of the word, steadfast in his friendships and kind and considerate in all his personal dealings. In his home life he was at his very best and his demise has brought to his widow a measure of sorrow that only time can soften and a loss to his little son that is none the less great because he is too young to grasp the full meaning of the calamity that has befallen him.

When such a man as Mr. Weiny is abruptly called hence—a man so full of life, so useful, so greatly loved and so true withal, words do not come readily to tongue or pen. We stand appalled by the suddenness of the blow and with tears upon our faces and with aching hearts, we humbly murmur, "Thy will be done" as, still wondering, we resume life's burdens and try to school ourselves to believe that, in some inscrutable way, everything that happens is for our eventual good.

WALTER P. PHILLIPS.

The Manhattan Electrical Supply Company.

One of the largest concerns in this country engaged in the manufacture of electrical supplies, as well as dealing in the same both wholesale and retail, is that of the Manhattan Electrical Supply Company, of 32 Cortlandt street, New York. This house occupies a unique position in reference to the telegraph trade, for it is a noteworthy fact that the executive officers of the company, as well as a number of its employees, are time telegraphers. Their graduation from the key into the field of manufacture, especially in that branch of it devoted to goods required in the telegraph service, has naturally given this concern a grip on telegraph business, and their operations within that field have expanded to large dimensions. Their success in this specialty may largely be attributed to that innate knowledge, gained by practical experience, of what the peculiar demands of telegraphy are. At their extensive works in Jersey City there are ample facilities for turning out all kinds of telegraphic goods promptly and in any amount desired. Here special experimental devices are carefully wrought out and many a telegrapher has been aided in having his sometime crude ideas put into practical design.

The officers of the company are J. J. Gorman, president; H. T. Johnson, secretary and treasurer; E. Whitmore, manager; B. H. Ellis, assistant treasurer, with D. C. Keefe, chief stock clerk and J. W. McDowell chief traveling representative.

No operator should fail to read TELEGRAPH AGE regularly. It will pay him to do so.

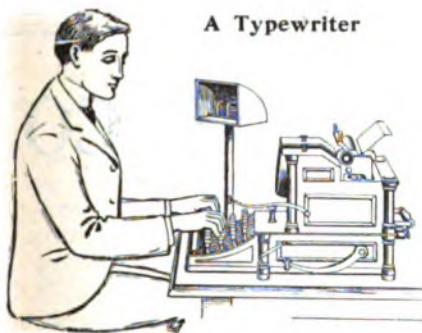
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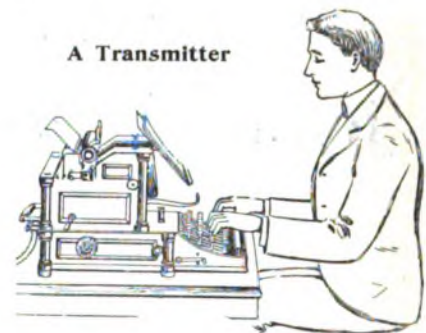
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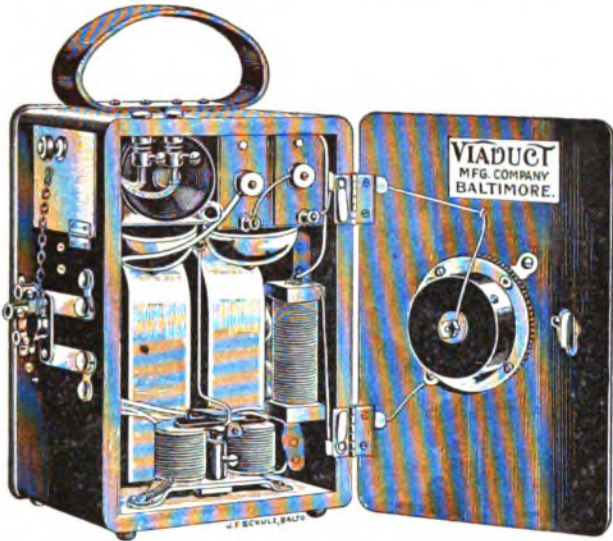
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Proposed Pensions for Military Telegraphers.

On November 16, Hon. Boies Penrose, Senator from Pennsylvania, introduced in the United States Senate, and Hon. Edward Morrell in the House of Representatives, a bill to pension the military operators who served during the Civil War. The bill, which is Senate bill 982, and House bill 2895, reads as follows:

A BILL.

Amending the Act of January twenty-sixth, eighteen hundred and ninety-seven, entitled "An Act for the relief of telegraph operators who served in the war of the rebellion."

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act of January twenty-sixth, eighteen hundred and ninety-seven, entitled "An Act for the relief of telegraph operators who served in the war of the rebellion," be amended by striking out and repealing so much of said Act as reads: "Provided, That this law shall not be construed to entitle the persons herein mentioned to any pay, pension, bounty, or rights not mentioned herein specifically," and by inserting in lieu thereof the words: "That the persons herein mentioned shall be entitled to the same rights of pension as are enjoyed by other honorably discharged soldiers who served in the war of the rebellion."

The bill in each instance was referred to the Committee on Pensions. It was prepared by Colonel William B. Wilson, president of the Society of the United States Military Telegraph Corps, and is the one upon which efforts looking toward its passage will be centered. All military operators who are interested and all operators who sympathize with the movement are requested to write their respective United States Senators and Member of Congress urging the passage of this bill, and also to confer with Col. Wilson, whose address is Holmesburg, Philadelphia.

During the Civil War, when the life of the Nation was at stake, there was no more patriotic and heroic arm of the service in the field than the telegraph operators who formed the United States Military Telegraph Corps of the United States army. All the movements of the army, all the confidence of the commanders, were intrusted to them. They did not plan campaigns or fight battles, but amidst the roar of conflict, they were found coolly advising the commanding general of the battle's progress. When the army was in motion they were in the advance, in the rear, right, left and centre, wherever duty was to be rendered. When retreat became necessary, it was their place to remain behind and announce that the rear guard had passed the danger line between it and the pursuing foe, and when the army was in repose hundreds of general officers had them at their elbows. Their services were invaluable, their sacrifices great.

Beginning at Yorktown, where brave Lathrop was killed, from east to west, and north to south, as our armies marched and fought, until peace was achieved at Appomattox, almost every field, almost every march numbered a telegrapher among the fallen. A hundred nameless graves throughout the battlefields of the Union attest

their devotion unto death to the sublime cause in which they were engaged.

It is a disgrace to the boasted patriotism of the American people that thirty-eight years have elapsed since the war closed, and yet no substantial recognition has been given by the Government to its faithful military telegraphers.

The military telegraphers of 1861-65 by their acts wrote an imperishable page upon their country's history and carved for the fraternity a niche high up in the temple of fame; and it seems fitting that the telegraphers of 1903 by their efforts in the cause of right and justice shall environ the niche with the garland of appreciation.

The Usefulness of the Electrophone.

Since the London "Daily Mail," by using the electrophone, beat the telegraph service by one hour and twenty-seven minutes in reporting Joseph Chamberlain's speech, made in Birmingham, England on November 4, as stated in our previous issue, the question has frequently been asked, "Why do not American newspapers use the electrophone instead of the telegraph in reporting important speeches at long distance?" That question has been answered by experts.

Mr. Chamberlain began speaking in Birmingham, 113 miles from London, at ten minutes after eight in the evening. He finished his speech at five minutes after ten o'clock, and a verbatim report of the speech was put on the street in London just twenty-seven minutes after Mr. Chamberlain sat down in Birmingham. An electrophone receiver was placed on the stand in front of the speaker in Birmingham and ten shorthand reporters received and transcribed the speech in short "takes" in the office of the "Daily Mail."

In this case the speaker, Mr. Chamberlain, could not move away from the front of the desk which contained the electrophones, without destroying the effect of the sound at London. In the United States the electrophone was discarded as being impracticable over ten years ago. Our telegraph and telephone service is so perfect in this country and our newspapers are so well equipped that the electrophone is not needed. In fact, it is not practical here. As far back as 1883 and 1884 it was given a thorough trial in New York. It was used in transmitting sermons and concerts to the homes of wealthy people, but it seems to have very little practical use. It is only employed in an ornamental way.

"Small Accumulators" is the title of an illustrated volume of eighty-one pages, by Percival Marshall, M. E. The book covers the subject of storage batteries, as indicated by its name, as fully as is possible, and it will be found a practical and trustworthy guide of the matter treated, readily understood by non-technical readers. The price of the book is fifty cents, an amount which covers the prepayment of express charges. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Gen. Greely's Report.

General Greely, chief signal officer of the United States Army, in his annual report shows that during the year the system of military telegraph lines and cables in Alaska authorized by Congress has been completed, and consists of 1,740 miles.

In speaking of the extreme difficulties encountered in running telegraph lines in the far north General Greely says:

"Very early springs, late autumns, enormous snowfalls, summer floods, impassable canons, and, last of all, a gold fever which stripped one officer of every civilian employe save one, have alternately impeded progress, but the energy and resourcefulness of the officers in charge of the work have met and overcome difficulties which seemed insurmountable." It is stated that one line was pushed along a route pronounced impracticable, and another across a country that had never before been trodden by the foot of a white man. Attention is called to the fact that not twenty miles of constructed wagon roads exist in the country traversed, and that as a rule all material was sledded into the interior in mid-winter and carried by pack animals over the roughest trail.

Of the enlisted men of the signal corps who made up the construction parties, General Greely says: "It is doubted whether in the peaceful annals of the army there have been met with nobler fortitude by the enlisted men equal conditions of hardship and privation." Tribute also is paid to the line of the army for its service in connection with telegraph construction in Alaska.

General Greely submits a plan for the reorganization of the signal corps to meet the increased requirements of the army. It is recommended that the enlisted force consist of three battalions of four companies each, each company to have a minimum force of 100 men. General Greely says there should be one additional colonel to give the signal corps the proportion of field officers equal to the minimum accorded any other staff corps of the army. The organization, he says, should be under the same conditions as those which characterize the admirable organization of the corps of engineers.

"The conditions of the enlisted men in the Philippines," says he, "has been deplorable, and that of the men in Alaska only less so. It should be possible to relieve men in the Philippines and in Alaska by the detail of companies which would guarantee to the men of the signal corps the same certainty of equitable service abroad as is granted to other branches of the service, but which indisputably has been denied to the signal corps of the army in the past as impracticable. This despite the favorable action of the Secretary of War."

The estimates for the Signal Corps proper cover two items—the first for the general work of the corps amounting to \$208,500 and the second for the continuance of the Alaskan cable system amounting to \$321,580. There was appropriated for Alaskan cables during the present year the

sum of \$485,000. The new estimate is for the purchase, installation, operation and maintenance of a submarine cable connecting the headquarters, Department of the Columbia, with military garrisons in Alaska, extending from Sitka to Fort Liscum. This extension, General Greely says, is necessary to connect the western Alaskan military telegraph section of 1,619 miles with the eastern section of 1,500 miles and make it a homogenous system extending from Nome, Alaska, to Seattle, Wash. It will give the United States, he says, direct telegraphic control of Alaska, independent of the Canadian telegraph lines, over which all military messages are now necessarily transmitted to and from the western military telegraph section, 1,619 miles in extent.

[Advertising will be accepted to appear in this column at the rate of three cents a word, estimating eight words to the line].


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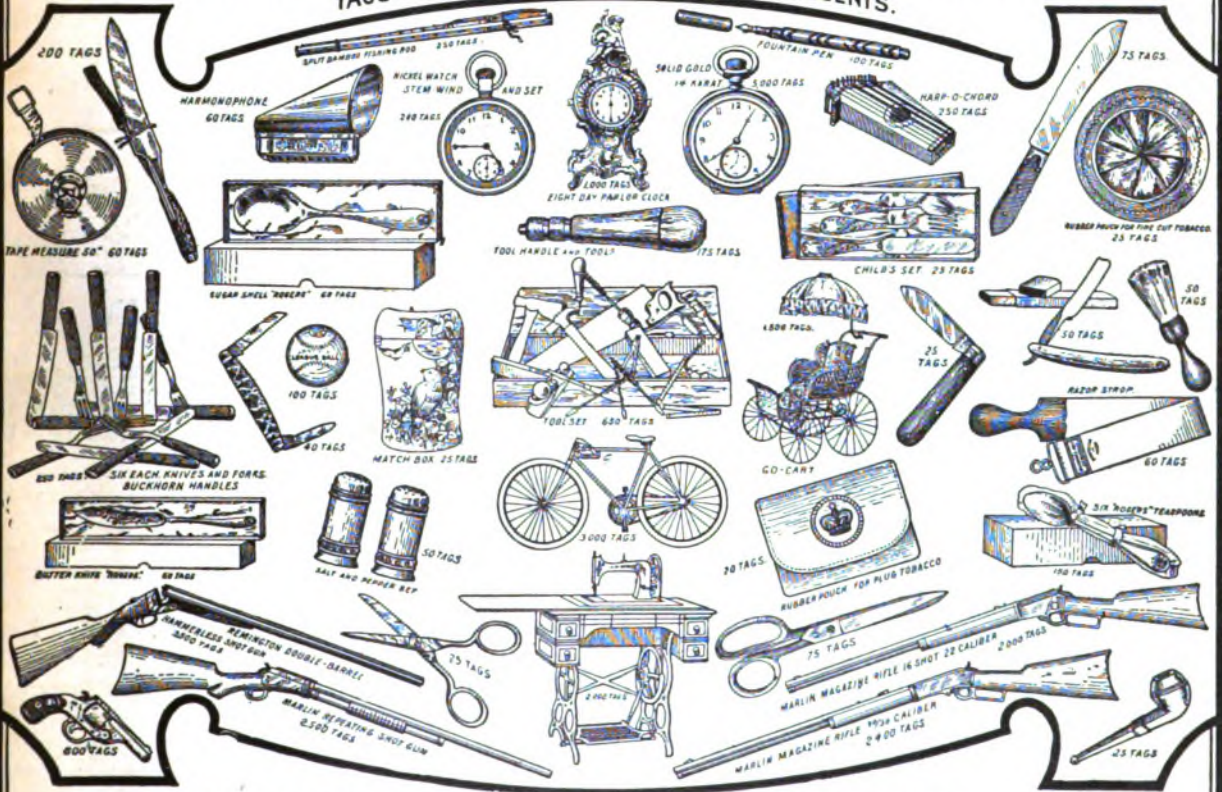
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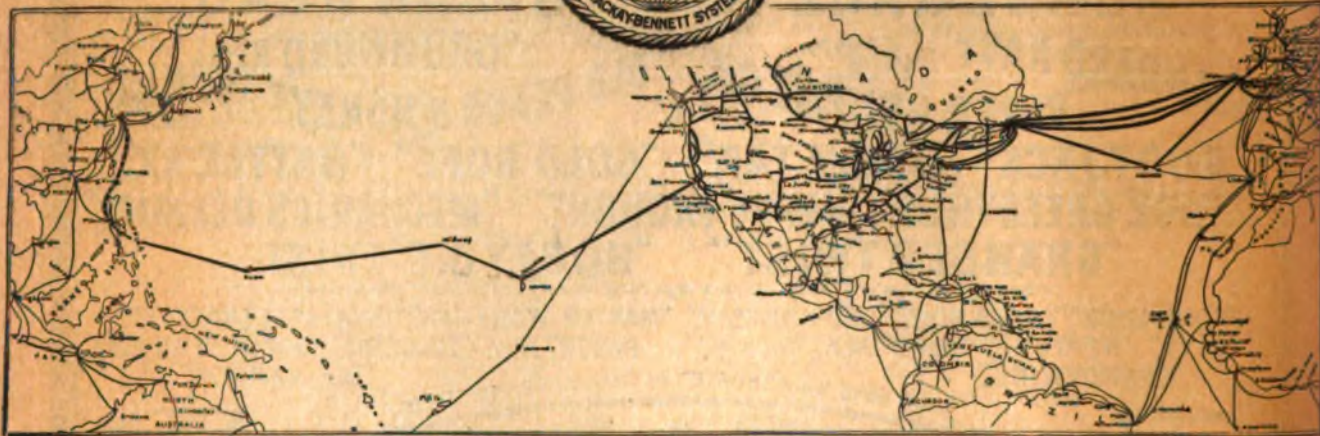
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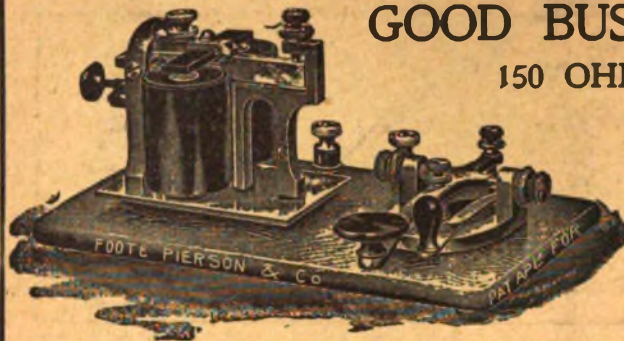
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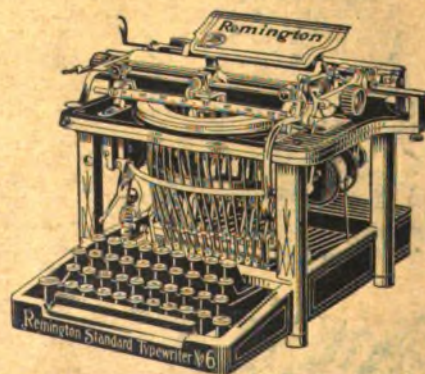
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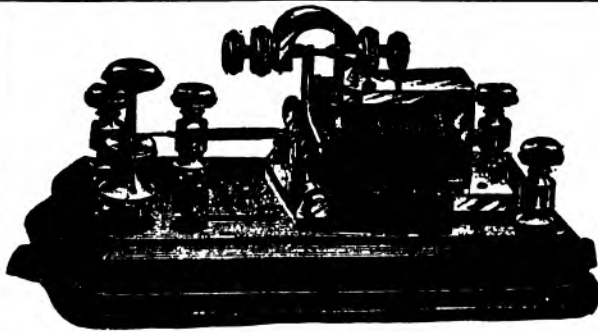


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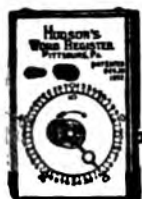
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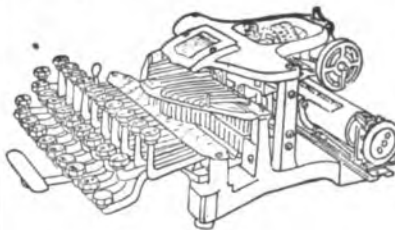


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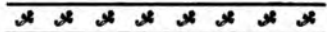
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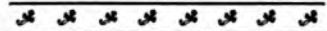
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THE TELEGRAPH AGE

No. 24.

NEW YORK, DECEMBER 16, 1903.

Vol. XX.

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

Curious Phases and Actions of Electricity.

Every now and then some subscriber of this journal writes to inquire what electricity really is, and whether there is more than one kind of it, seemingly under the impression that electric light, plating, motive power, magnetic force, etc., are each derived from a separate, or individual, kind of electricity.

Electricity is one and the same thing under all circumstances, regardless of its source or manner of production. It may be due to chemical action or generated by mechanical means, yet the product is identical in either case.

As to what electricity consists of no one has as yet been able to advance any conclusive explanation. The most that can be said respecting it is that what we call an electric current is that particular phase of the original source of all power, the sun, which develops in a wire (or other suitable conductor) when the latter metallicly joins two points themselves in a state of energetic excitation, but possessing different degrees of value. That is to say, the "condition" the wire or conductor assumes under these circumstances repre-

sents the active and harnessable phenomenon known as electricity.

Electricity possesses neither weight nor substance, and like gravitation its consistency is beyond the present comprehension of the human mind, hence the correspondent may safely pass over that question, at least, for the present.

The various phenomena of heat, light, electric power, etc., are but as many manifestations of different "conditions" produced in the wire, or conductor and are brought about at will by man's ingenious manner of controlling and utilizing this original source of earthly power.

Now, if we assume that electricity is a phase of energy we may note here that two charges of unequal values or potentials of the same will endeavor to combine and find a common level if a means be provided for its doing so, as water will flow between two different elevations, or heat from high to low temperature.

In primary batteries the copper and the zinc plates, respectively, as well as the solution in the glass jar, until affected by extraneous influences, are each in a latent state, so far as their sun-inherited power is concerned. That is to say, their respective energies are each in a state of equilibrium within its individual containing medium, yet relatively possess unequal values of potential as compared with one another.

Copper and zinc plates are selected as agents for creating widely differing electric conditions or values of electric potential because the normal degree of difference is greater between those two dissimilar metals than exist between any other practical combination. Now, these two metals hold such relation to each other that when they are placed in contact with each other out side of the battery jar by means of a metal conductor, such as a copper or iron wire, an initial transfer of energy begins and an effect is created which causes chemical action to set in within the cell, whereby the solution is gradually decomposed, and the zinc consumed. The decomposition of the solution means the separating of certain elements, and as this cannot be accomplished without an expenditure of energy, it is plain that the battery cell becomes an active source of energy, and the latter must find an outlet somewhere for the reason that its natural trend is to again seek a level or equilibrium.

The result of such chemical action is that the said energy causes the two metals to become intensely excited, electrically, and the connecting metal conductor affords a natural means of union or equalization of the different values of excita-

tion contained in and existing at the two electrodes. The transfer of energy between these two points creates the "condition" in the connecting wire which is called electricity, and as long as the chemical action continues the departing energy will be replaced, and the supply maintained, thereby insuring a continuous transfer or flow of electric current. The degree of excitation will be in proportion to the intensity of the chemical action, and the quantity of current used measured by the rate at which the zinc is consumed.

In the dynamo, or mechanical production of electricity, the unequal values of electrical excitation between two points, similarly connected by a metal conductor, is accomplished by causing a coil of wire to do more mechanical work in one portion of its winding than in another. The unequal degree of excitation thus produced at two points in the convolutions of this closed continuous conductor, or coil, obviously creates different values or degrees of potential at those points. The output of this arrangement is an electric current in the coil itself due to the transfer of energy through the copper windings from points of greater to lower values, and the supply will be maintained as long as mechanical power from an external source, such as a steam engine, compels the said coil to continue doing the particular work for which it was constructed. The work demanded of the coil is to force its way, while revolving rapidly, through the resisting magnetic lines of force streaming between the two polepieces of a powerful magnet, the density of which lines are greater at one point than another. Thus it may be seen that the manner of creating an electric current has nothing to do with altering its consistency, whatever that may be, it is all alike. The effect or manifestations produced by an electric current, however, is due entirely to the manner in which it is harnessed and controlled, or rather, to which of its various properties are utilized for a given purpose. For instance, when a current of electricity flows through a wire it is doing work owing to the resistance the conductor offers to its progress. Work means the evolution of heat, which quickly dissipates into the atmosphere all along the conductor of a telegraph or other long circuit without increasing the temperature of the wire in an appreciable degree, but if the same amount of electric energy be forced through a very short wire, the same amount of energy that was evenly distributed throughout the entire length of the telegraph wire, will then have to be spent practically in one spot, with the result that the heat will be evolved so rapidly that the short conductor cannot furnish sufficient air space to carry it off. In this case the conductor will first become red hot and then melt, if the current is allowed to flow for any considerable length of time. Now, this property or phase of electricity is utilized for the purpose of electric lighting. A short length of carbon filament is placed within a glass globe vacuum, to prevent combustion, and a greater volume of current forced through it than it can carry without becoming incandescent. Here

we have the fundamental principle of electric lighting.

Another property of electricity is magnetic lines of force which rotate invisibly around every conductor carrying a current. The encircling rings endeavor to contract their diameter as much as possible but the presence or proximity of a bar of iron will cause them to expand and reach out towards this object of their preference, in order to encompass the metal within the sphere of its travel. The tension thus given causes the magnetic rings to act like expanded elastic bands. The result is that the metal bar is "attracted;" that is to say the contracting rings, if numerous and strong enough, will pull the metal in, to the extent that the rings contract. Here we see the principle of electromotive power, the manipulation of the delicate armature of a telegraph instrument, call box, fire alarm, and all other magnetic apparatus, including the rotating of the armature and pulley of a powerful motor are all due to the contracting tendency of this particular phase of electricity.

Electro-plating is accomplished by utilizing that property of electricity which decomposes water and various solutions through which an electric current flows. Thus when a solution of silver, gold, copper or any other desired metal is decomposed in this manner, the separated elements attach themselves to objects placed in their path. Metal spoons, knives, forks, etc., immersed in such solutions, soon become coated with the metals thus liberated.

Finally we come to wireless telegraphy. This is accomplished by utilizing the intense disruptive effect produced on ether, (that all pervading medium which occupies all space, even to the inmost compartment of so-called solid bodies) when a current of electricity is suddenly broken. When the latter occurs, magnetic impulses are imparted to the surround ether, (which latter may be compared to a sphere of gelatine), the resulting "jar" sets it to quivering and the impulses are thus propagated to indefinite distance in waves oscillating at a rate regulated by the intensity of the electric discharge.

As the response of a tuning fork to a particular note is due to a given number of air vibrations, so is the coherer, or receiving apparatus of a wireless telegraph outfit dependent upon a certain rapidity and intensity of ether effects, and because ether is present within all so-called solid bodies the reader will understand why such signals are not stopped by the walls of buildings, mountains, etc. The continuity of the ethereal mass is unbroken, all earthly objects seem to be simply immersed in it.

The reader will now appreciate what difficulties the wireless people are compelled to face. In a word, one wireless company endeavoring to start this big ethereal ball to quivering and then construct a tuning fork that will catch the particular vibration imparted, while a dozen others are bombarding it from other points, each interrupting and confusing the other.

Recent Telegraph Patents.

No. 744,575.—Miniature telegraphic instrument. Benjamin I. Levi, New York. A sounder for miniature instruments.

No. 745,279.—Type printing telegraph. Frederick H. W. Higgins, London, England. The impelling pallets for the escapement of the type wheel, are caused to strike quick sharp blows, which, it is claimed, increases the rapidity of operation.

No. 744,041.—Telegraphic code. Charles G. Burke, Brooklyn, N. Y. In this code each character consists of two parts, each composed of one or more dots and each part having a numerical signification, both parts constructed as a whole indicating a definite position on a chart or scale to which has been assigned a letter of character.

No. 744,165.—Automatic printing telegraph system. Louis Casper, Chicago, Ill. A transmitter tape having different series of perforations is fed or controlled by a motor synchronous in action to another motor operating the printing wheel of the receiver, the tape being used to send multiple signals or impulses which vary in polarity and current intensity.

No. 744,046.—Electric printing-telegraph apparatus. Henry Casevitz, Paris, France. Successive currents of different sign are received by an electromagnet device adapted to control the registration or failure of registration of the current sent, according to its sign, each registered current being made to rotate a shaft carrying a type wheel through a certain angle determined by the order of arrival of the current.

Wireless Telegraphy.

A patent, No. 744,936, for a receiver for wireless telegraphs or telephones, has been awarded to Andrew Plecher, Bristow, Va.

A patent, No. 744,897, for means for directing electric waves for use in wireless telegraphy, has been granted to Ferdinand Braun, Strassburg, Germany. The invention relates to reflectors and consists chiefly of a metallic grating of parabolic form.

From London comes the announcement that the Marconi company has made fresh discoveries, which will greatly facilitate the sending and receiving of long distance messages, and that these improvements will be applied to the system before it is opened for public use, some months hence. From another source comes the statement that it is possible that the construction of towers and the raising of poles for transmission of transatlantic messages will be done away with, and that communication will be conducted from the level of the sea.

A cable dispatch from London, of November 28, says: The experiments with the De Forest wireless telegraphy system were carried out to

the entire satisfaction of the British postal representatives across the Irish Sea, between Howth and Holyhead, a distance of sixty-four miles. Messages were transmitted at the rate of thirty and thirty-five words a minute, the replies being received quicker than by the ordinary telegraph. Although a Marconi station was close to the De Forest installation at Holyhead, there was no noticeable interference with the messages.

A telegram from Rome states that the work of constructing a large wireless telegraph station at Bari is far advanced, and the station may be opened towards the end of the present year. This station will be able to communicate with the other stations established along the Italian coast, with vessels in the Adriatic and with the Montenegrin station at Antivari, where the work of installation will be commenced in a day or two. The wireless telegraph stations at Maddalena, Monte Mario, near Rome, Palmaria, Cozzo and Spadafora are already working. The first two are exclusively intended for military purposes; the other two will also be open to the public. Another station will be opened immediately at Santa Maria di Leuca. The site for another powerful Italian station has been definitely chosen at San Rossone, where the Villa Royale has been selected. It is said that this station will be able to communicate not only with Argentina, but also with the stations at Table Head, Cape Cod and Poldhu.

Although much is already known of wireless telegraphy there is a great deal yet to learn, and one thing is why it is possible to work the apparatus at much greater distance over water than land. The possibilities of interruption and even of entire confusion still exist, and not infrequently before and during a thunder storm.

These messages, caused as they are by a disturbance of the ether, can be sent through the side of a house as readily as a ray of light goes through a pane of glass. Marconi has a so-called tuning method which he claims will prevent interference on the part of other wireless telegraphers operating at the same time. The Marconi coherer is said to be a conductor of other real disturbances but a non-conductor of electricity.

Morse telegraph messages, the form of signaling by wire invented by Prof. Morse, sent through the ether were received twenty years ago not by telegraph but through the telephone from wires projected in the air. For this discovery a patent was asked, but the patent office said the discovery was contrary to science and it took three or four years to convince the officials of the patent office that the thing was scientifically possible. Professor Dolbear of Tufts college is said to have been the discoverer.

“Pocket Edition of Diagrams,” etc., 260 pages and 126 illustrations, published by TELEGRAPH AGE, contains just the information that every telegrapher requires, irrespective of his position.

The Railroad.

Mr. Charles H. Hines has been appointed electrical engineer of the Canadian Pacific Railway Company, with headquarters at Montreal. His duties will relate to electric lighting, power, etc., which has become a large question with this railroad company.

The Pennsylvania Railroad will begin the immediate construction of two trunk line telephone wires between Pittsburg and Philadelphia, at a cost of \$75,000, according to the American Telephone Journal. The lines will be used exclusively for the use of officials of the company. The estimated cost is exclusive of poles. The wires will be strung on the new poles recently erected by the Pennsylvania Railroad for the use of the Postal Telegraph-Cable Company. They will be of the heaviest copper, and it is said that the line will be the most expensive one ever built. In addition to the new through lines, the company will maintain its own telephone wires between division points, such as Altoona and Pittsburg and Altoona and Harrisburg.

The following patents have been issued lately:

No. 744,599, for a railway signaling apparatus, to James A. Norton, Odebolt, Ia.

No. 744,248, for a railway signaling system, to Judson Shoecraft, Eskridge, Kan.

Nos. 745,307; 745,308; 745,309, for a railway signal, to John P. Coleman, Edgewood, Pa.

No. 745,277, for an electric train signal, to William J. Hare and James P. Hare, Toronto, Canada.

No. 744,706, for a block signaling system and apparatus therefor, to James E. Allison, St. Louis, Mo.

No. 744,716, for a signal for railway, to Willis C. Bryant, Elizabeth, N. J. A system especially adapted for tunnels, the signal being placed on the locomotive.

A recent patent, No. 744,655, covers a system of signaling moving trains. In this system a series of short conductors, all wired to the same line wire, are arranged upon poles at suitable intervals along the track. Each locomotive carries a contact adapted to engage the distributed contacts. When it is desired to signal a train the operator, through a switchboard, puts grounded battery upon the line so that as soon as the locomotive makes a passing contact with it an electromagnetic device will cause the sounding of a whistle in the cab. The engineer will then bring his train to a stop at the next stationary contact and with a telephone outfit, of which the signaling device forms a part, call up and ask for orders. Messrs. J. A. Whyte and G. C. Edwards, of Toronto, Canada, are the joint patentees of this system.

"Pocket Edition of Diagrams," etc., by Willis H. Jones, electrical editor of TELEGRAPH AGE, embodies more practical information concerning the telegraph, than any book or series of books hitherto published. See advertisement.

The Cable.

A conference of the partners in the all-British transpacific cable will shortly be held in London, Eng., at which a proposal will be made to lay a cable between Canada and Great Britain.

The Dominion Government telegraph repair steamer Tyrian recently completed a three months' trip laying cables and repairing land lines in Nova Scotia, and along the northern shores of the Gulf of St. Lawrence to Chateau Bay, opposite Belle Isle.

The cricket matches in Australia have been the means of giving much publicity to the question of speed of transmission on the submarine cables between Australia and England. The two systems are owned respectively by the Eastern and Eastern Extension Telegraph Companies and the Pacific Cable Board, and the following schedule of times occupied by the two routes in transmitting the accounts of the match with New South Wales late in November is interesting: On Friday, November 20, the Eastern route occupied 19 minutes, as against 17 minutes on the Pacific cable; on Saturday, November 21, the Pacific took 50 minutes to get through, as against 12 by the Eastern, and on Monday, November 22, the Eastern got the result of the match over in 15 minutes, whereas the Pacific cable only took 11 minutes. In order to get these messages through the line the whole route had to be cleared, and, in consideration of "urgency" the rate is increased from 3s. per word to 9s. per word. We need hardly remind our readers, says the "London Electrician," that "speed" in this case is a question of organization, and has no connection with the electrical properties of the cables.

The Yetman Transmitter.

The long-distance carrying qualities of the Transmitting Typewriter were admirably demonstrated recently by Mr. A. A. Gilson of The Associated Press, who operates one of the machines out of Louisville. Mr. Gilson sent 87 sheets of manifold in one day over a circuit 1,200 miles long and upon which there were five sets of repeaters.

Among the largest Eastern roads which have adopted the Transmitter, are the Pennsylvania lines, the Delaware, Lackawanna and Western, New York Central, West Shore, New York, New Haven and Hartford and the Long Island.

The Rock Island road has installed these machines and have them in daily use upon their Chicago and Topeka wires. The Santa Fe and other western roads are now instructing their men as rapidly as possible with a view of equipping their systems with the Transmitter.

The action of these representative roads will no doubt be followed by other systems throughout the East and West in the very near future.

Personal Mention.

Mr. E. T. Lefevre is the director-general of telegraphs and telephones of the new Republic of Panama. Mr. Lefevre intends to reconstruct and extend the telegraph system of his country and is purchasing American material for the work.

Mr. John Burry, electrical engineer of the Stock Quotation Company, New York, has been made receiver of the *Amerikanische Schweizer Zeitung*, the leading Swiss newspaper in the United States. This goes to show that a man of telegraphic experience is fitted to occupy almost any position, even within the gift of a court. We wish our brother editor, Mr. Burry, abundant success in his latest undertaking. We hope that the laborious details of editorial work will not ruffle his usual good nature, or cause any of his hair to turn gray.

General Mention.

The Postal Telegraph-Cable Company will soon open an office in Guthrie, O. T.

Mr. J. Hargrave, of Atlanta, Ga., the electrician of the southern division of the Postal Telegraph-Cable Company, in renewing his subscription says: "I have been a victim of the 'AGE' habit so long that I cannot afford to be 'cut out' for a single issue."

The Western Union Telegraph Company at St. Joseph, Mo., H. H. Demarest manager, will soon occupy a new main office which will be modern in every particular. The equipment will include a dynamo or plant which will replace the present gravity batteries now in use at that point.

The leased wire system of the American Tin Plate Company, New York, which is part and parcel of the Steel Trust, has been discontinued. The services of Mr. H. C. Duvall, the superintendent of the system, together with a dozen first class operators, have been dispensed with.

Mr. J. B. Korndorfer, a well known New York telegrapher, now chief clerk of the Corn Exchange National Bank, of this city, in remitting to cover his subscription for 1904, states: "Although I have left the telegraph business, you can't lose me. Your paper cures me of homesickness."

Mr. R. C. Baker, manager of the Western Union Telegraph Company at Peoria, Ill., in renewing his subscription for two years writes: TELEGRAPH AGE is a paper that should be taken and read by every one in our profession. It is a thoroughly up-to-date and highly instructive journal."

The second annual ball given under the auspices of the Knickerbocker Division of the Order of Railway Telegraphers, took place at the Manhattan Casino, New York, on December 11, and it was a very enjoyable affair. The committee of arrangements consisted of Geo. Jessop, E. M. Thurston, A. K. Babcock, T. A. Gleason, T. J. Finnerty, C. E. Becker and W. G. Wooley.

We are in receipt of a Christmas greeting card from Mr. "Jim" Brown, of the South African Telegraphic service, at Johannesburg. It bears a photograph of the general post office, Johannesburg, showing a beautiful clock tower in course of construction. The general post offices in countries where the Government controls the telegraph include the central telegraph offices.

The telegraph operators employed in the local offices of the Western Union and a number of other friends got together December 1 for the purpose of showing their appreciation of Isaac Morris, for many years manager of the Cleveland, Ohio, Western Union office. Former Superintendent E. P. Wright made the presentation speech, the gift of the friends being a fine leather-covered chair.

Mr. Morris, as announced in our previous issue, has accepted the managementship of the National Automatic Fire Alarm Company of Ohio, with headquarters at Cleveland, succeeding Mr. Clarence Pumphrey, who remains the manager at Cincinnati. Mr. C. E. Page, formerly manager of the Western Union Telegraph Company at Cincinnati, and later superintendent of the same interests at Boston, is president of the National Automatic Fire Alarm Company.

Resignations and Appointments.

Mr. J. B. Fogleman, of Burlington, N. C., is assisting Manager L. B. Beazley, of the Postal Telegraph-Cable Company, at Winston-Salem, N. C., owing to rapidly increasing business.

Mr. Charles W. Mitchell, for the past two years an operator in the employ of the Postal Telegraph Cable Company, at Plattsburg, N. Y., has been appointed manager of the company's interests at Newburg, N. Y.

Mr. A. M. Dafoe, of Chicago, Ill., has been appointed manager of the Postal Telegraph-Cable Company, at El Paso, Texas, vice George L. Morgan, transferred to Omaha, Neb., to enter the construction department of the company.

Mr. M. C. Linnaberry, of the Western Union Telegraph Company, at Easton, Pa., has resigned to enter the employ of a brokerage firm at the same point. His position will be filled by the promotion of A. R. Barlieb, of Bethlehem, Pa.

Mr. W. G. Peebles, manager of the Western Union Telegraph Company, at Macon, Ga., has been transferred to the Savannah, Ga., office, in a similar capacity, relieving Manager H. M. Killian, who has resigned. Mr. O. T. Moore, the manager at Athens, Ga., has been promoted to the management of the Macon, Ga., office.

No telegrapher, no matter what his position may be, who values his place and aspires for promotion based on all-around practical knowledge, can afford to be without "Pocket Edition of Diagrams and Complete Information for Telegraph Engineers and Students." See advertisement.

Municipal Electricians.

A patent No. 744,849, for a fire alarm system, has been granted to Albert J. Woodworth, Sparrows Point, Md.

Emile Guarini, of Brussels, Belgium, has invented a wireless telegraph fire alarm system. The invention consists in providing a building to be protected with an automatic wireless telegraph transmitter governed by a thermometer, in such a way that when the heat reaches a certain temperature the transmitter circuit is closed, and the apparatus automatically transmits to a receiver placed, for example, at fire headquarters, or any other convenient place, the proper signals, which locates the place which is in danger.

Since Mr. Morris Mead, city electrician of Pittsburg, Pa., who was one of the most competent men in his profession, was turned out of office to make room for a politician, the fire alarm and police telegraph systems of the Smoky City have evidently been running themselves for the past three months. The "Chronicle-Telegraph" of that city in a recent issue has this to say regarding the serious situation at that point:

"Superintendent Elmer G. Loomis, of the Allegheny bureau of electricity, under orders from Mayor James G. Wyman, has been working for several days in the Pittsburg bureau of electricity in the Safety Building in Sixth avenue. He came over in response to an appeal from Mayor Hays to get the Pittsburg bureau out of the trouble in which new and inexperienced employees had gotten it.

"For several weeks the entire electric system of fire signals and police calls has been out of order, and those in charge of that part of the work have called for assistance from Allegheny. Matters became so bad recently that it became imperative that some person who understood the electric signal service in use in Pittsburg be secured and Mr. Loomis transferred his office to Pittsburg, and has since had entire charge of affairs in the bureau of electricity. Superintendent John A. Herron and employees obeying his orders so that the system might be rescued before it became necessary to install a new service."

Business Notices.

The Montauk Fire Detecting Wire Company, of 100 Broadway, New York, has received from Thomas Oakes and Company, of Bloomfield, N. J., the following letter:

"We beg to advise you that the 160 degree fire detecting wire you sent us several months ago which we fitted to our main headshaft bearings, gave us an alarm on December 2, of an overheated bearing. The low temperature at which this warning was given enabled us to correct the trouble without any serious results."

At this time of the year when the wife, the mother, the daughter, the sister, are pondering over the momentous question of what they shall give the hus-

band, son, father, brother, especially if they be telegraph operators, for a Christmas remembrance, nothing could be more appropriate or useful than a 20th Century Telegraph Key. This device not only makes fast sending easy, but cures and prevents loss of grip. Read the advertisement on page 634, and then write to E. S. Russell, 253 Broadway, New York, the general agent, about it.

The Postal Typewriter, because of its excellence of construction, universal keyboard and capacity for executing good work, appears to be meeting a want required in a low-priced machine. Because it can be bought for twenty-five dollars it does not follow that the Postal is a poor invention. On the contrary, it is an exceedingly good instrument and embodies many points of utility that will meet with the commendation of typewriter users. It is of the wheel pattern and the writing is as near perfect as a typewriter can be made to write. Moreover, the writing is constantly in sight, and it has the further advantages embraced in strong manifolding power, interchangeable type, etc. Then, again, the weight of the typewriter is only ten and one-half pounds, which makes it easy to carry around, and, since the company is selling it on the installment plan, the machine is within reach of almost everybody who can furnish good enough reference to get the Postal typewriter that way. Attention is called to the advertisement of this typewriter appearing on page VI. Those who are interested should address the Postal Typewriter Company, 45 Cliff street, New York.

The Pennsylvania Railroad Experiences Opposition.

The contention which has been going on for some time between the citizens of Lilly, Pa., and the Pennsylvania Railroad Company over the erection of telegraph poles by the company in that borough and which has been extensively aired in the courts, broke out in full force again on November 27. About 9 o'clock a gang of men commenced the digging of holes and the erection of poles on Railroad street, both in the east and west ends of the town. As soon as the work began the citizens commenced energetic measures.

The fire whistle was blown, the hose cart and apparatus was gotten out and people flocked to the scene of operations. The hose was turned upon the company's workmen and the stream of icy water soon proved too much for them. They retreated and the citizens made short work of the poles already erected, downed them in a twinkling and filled up the holes.

The word "deadhead" is, according to some authorities, one of great antiquity. It is said that a "deadhead" was in Pompeii an individual who gained admission to an entertainment free of charge by means of a pass in the form of a small ivory death's head.

Death of Albert J. Wise, President of the J. H. Bunnell & Co., Corporation.

Albert J. Wise, aged thirty-four years, a lawyer of New York, and the president and treasurer of the well known corporation of J. H. Bunnell & Co., died suddenly on the morning of December 10, at his home 533 West 162 street.

Mr. Wise was born in Lima, Ohio, September 24, 1869. He was a graduate of Yale University and both from his alma mater and from Columbia University he received the degree of LL. B. At first he began the practice of law in his native town, and speedily came to the front as a lawyer of decided ability. Lima proving to be too small a sphere for him, he removed to New York in 1891, where he had since been engaged in the practice of his profession, in which he was a prodigious worker, frequently extending his labors far into the night. He built up a large practice. In 1896 Mr. Wise married Miss Gertrude Bunnell, daughter of the late Jesse H. Bunnell, the well known old time telegrapher, inventor and



THE LATE ALBERT J. WISE.

manufacturer. In the firm changes of J. H. Bunnell and Co., consequent upon the death of Jesse Bunnell, Mr. Wise, as an executor of the estate, after establishing the separate house of the Bunnell Telegraphic and Electrical Company, acquired the interest of Charles McLaughlin in the older firm, of which he then became the president and treasurer, the vice-presidency and general managership being placed in the hands of Mr. J. J. Ghegan, for many years identified with the house.

The funeral services which were conducted according to the Masonic and Episcopal forms, occurred on Saturday noon, December 12, and were attended by a large number of relatives and friends, many well known business men being noticed among those present. There were also present a large delegation of employees from the three Bunnell factories. The floral pieces were not only numerous

but beautiful and elaborate in design. The pall bearers were Dr. J. G. Ward, C. E. Merritt, A. C. Quackenbush, J. J. Ghegan, T. Alfred Vernon and B. W. B. Brown.

The office of treasurer in the house of J. H. Bunnell and Company made vacant by the death of Mr. Wise, has been filled by the appointment of Mr. Charles E. Merritt, of the Commercial Cable Company.

Joseph W. Kates in the Civil War Period.

Mr. Joseph W. Kates, superintendent of the Postal Telegraph-Cable Company at Richmond, Va., is not a stranger in South Carolina, says the Columbia (S. C.) "State." He constructed submarine cables in Charleston harbor during the war and was engaged at the headquarters of Gen. Beauregard. He prizes very highly special order No. 58, issued by the Assistant Adjutant General, Maj. Jno. M. Otey, at the instance of Gen. Beauregard. This order, dated Feb. 29, 1864, declares:

"At his own request, Mr. Joseph W. Kates is relieved from duty as superintendent of the military telegraph lines in and around the city of Charleston and W. R. Cathcart, Esq., is assigned to the superintendence of the same.

"In relieving Mr. Kates the commanding General takes occasion to tender his sincere thanks for the prompt, zealous and intelligent manner in which he has performed the duties entrusted to him."

The Charleston "Courier," of March 2, 1864, said:

"The department, in parting with Mr. Kates, loses a valuable assistant, as all who know the difficulties under which he has labored can testify. He goes to Richmond and has our best wishes for his future success. While we regret the unavoidable circumstances that take him away from us, it is gratifying to know that he leaves behind him a worthy successor. Mr. Cathcart, who is a native of Columbia, has been connected with the telegraph lines in the State since the session of the Legislature which made the call for a convention of the State."

The late Mr. Cathcart was manager of the Western Union office at Columbia, S. C., for a number of years. He received the last message sent by Gen. R. E. Lee, the sender being Operator McDonald, of Winnsboro.

Recent New York Visitors.

..Mr. J. E. Golden, superintendent of the Tide Water Pipe Line Company, Bradford, Pa.

Mr. F. E. d'Humy, electrician of the Postal Telegraph-Cable Company, Boston, Mass.

Mr. F. A. Bardwell, formerly manager of the Western Union Telegraph Company, Springfield, Mass., now the manager of a brokerage house at the same point.

Death of William D. West.

William D. West, aged fifty-two years, chief operator of the Western Union Telegraph Company at Mobile, Ala., and well known throughout the country through his long years of service as manager and chief operator of the New Orleans, La., office of the same company, died of pneumonia, at Mobile, on December 1. Mr. West had been suffering for the past two years from a complication of troubles, and last year spent a number of months in California in the hope of regaining his health. He returned South some months ago, when he was appointed to the position he held at the time of his death.

Mr. West was born in New Jersey, January 26, 1851. Removing to Wisconsin at an early age he entered the railroad telegraph service in November, 1865. Four years later, at St. Louis, and afterwards at Shreveport and New Orleans,



THE LATE WILLIAM D. WEST.

he found employment with the Western Union Telegraph Company. After a brief connection with the Pacific and Atlantic Telegraph Company at New Orleans and St. Louis, he was given a position with the Western Union Telegraph Company at New Orleans. In 1879 he was advanced to be night chief operator. In March, 1881, he was made chief operator, but in May he resigned to enter the service of the Mexican and South American Cable Company, at Tampico, Mexico. Soon tiring of this he returned to New Orleans, before the year had expired and was restored to his former position of chief operator, afterwards succeeding to the managements of the office. Ill health compelled his resignation from this post less than two years ago. He leaves a wife.

Obituary Notes.

Andrew J. Baldwin, one of the first construc-

tors of telegraph lines in this country, died on December 5, at Wilkesbarre, Pa., aged seventy-nine years.

Lulu M. Clark, telegraph operator at Tyler-ville, Conn., died on December 3.

William Tucker, aged fifty-two years, for many years previous to 1887 an employe of the Direct United States Cable Company, and considered one of the finest and most expert Continental and Morse operators in the country, died in New York on December 1, of Bright's disease.

Albert A. Honey, an old time telegrapher, died at Chicago, on December 4, in the sixty-fifth year of his age. At the age of twelve years he began work for the old Illinois Telegraph Company, and was one of the three operators first employed by The Associated Press in Chicago. Later he became interested in railway construction and was an inventor of some note.

Anglo-Spanish Telegraphy.

The Spanish telegraph administration have set apart a special direct wire between Bilbao and Madrid for the Direct Spanish Telegraph Company's traffic, and have further agreed to devote a direct wire between the capital and Valencia to messages exchanged with the latter place during the busy hours of the day. It has also been arranged that the Vigo station of the Eastern Telegraph Company should work direct with Madrid, using the Hughes instrument. The effect of these connections is to give direct communication between Bilbao and Madrid and Valencia on the one hand, and to quicken communication between Vigo and Madrid on the other. The transmission of messages with many principal towns of Spain will thus be greatly accelerated.

Bound Volumes of Telegraph Age.

A gentleman who has lately ordered a bound volume of TELEGRAPH AGE for the year 1902, writes to us to the effect that if we will supply him with such a volume with the index bound therein, he will, in addition to his regular subscription, be very glad to place a permanent order with us for the same to be delivered to him each year, at a cost of \$3 per volume. This would relieve him, he explains, of the necessity of saving each number as it is received, from which he often clips items and so spoils his file, thus making it undesirable for binding purposes.

Very likely there are others who value TELEGRAPH AGE much as our correspondent does, who mutilate their regular subscription issues and yet who wish to preserve bound volumes intact from year to year. All who require to be supplied are requested to notify us at an early date so that there may be no difficulty experienced in maintaining full files for the purpose.

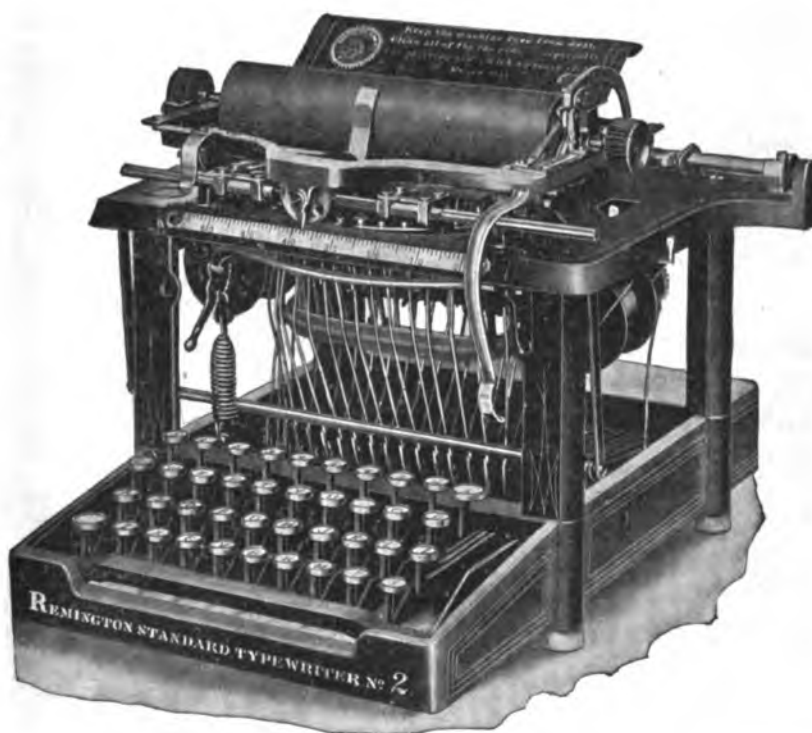
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- The A. J. Coffee Company, 830 Market Street, San Francisco, Cal.
- Oliver P. Crocker, Atlanta, Ga.
- Wm. E. Decrow, 178 Devonshire Street, Boston, Mass.
- Southern Electric Co., 203 Fayette Street, Baltimore, Md.
- H. M. Cross, 211 E. 4th Street, Cincinnati, O.
- Utica Fire-Alarm Telegraph Co., Utica, N. Y.
- Gordon Oddy & Co., Johannesburg, South Africa.

The Telegraph Chronicle

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NEW YORK, December 16, 1903.

The amount of information contained in each issue of TELEGRAPH AGE of the utmost practical value to the progressive operator who is ambitious to succeed, to acquire a more thorough knowledge of his profession, and not only to better qualify himself for the position he now occupies, and consequently for advancement, should prompt many to send in their subscriptions to this journal without delay. The first article in each issue, contributed by Willis H. Jones, under the standing heading of "Some Points on Electricity," contains more positive instruction concerning the telegraph, than can be found anywhere else, and worth more to the operator than many times the cost of the paper itself. Subscriptions should be sent direct to this office, or to any of our agents who may be found with both the Western Union and Postal companies in nearly every large centre in the United States.

We are prepared to furnish a limited number of bound volumes of TELEGRAPH AGE, which embraces 536 reading pages, besides the index, for the year 1902, at the uniform rate of \$3 a volume. The binding is substantial and the lettering is done in gilt. The volume furnishes a complete record for the year named of the telegraph, the cable, wireless telegraphy and other allied interests, the whole constituting an interesting work of reference of the highest worth to all telegraphers, libraries, etc., to which the carefully prepared cross-index lends additional value. Single copies of the index for volume XIX, covering the year 1902, may be had at ten cents apiece. Our friends who require copies of the bound volume, or of the index alone, should send in their orders promptly so that they may be filled while the supply lasts.

Reward Comes To the Student.

The student in telegraph engineering is to-day greatly in advance in electrical knowledge over his predecessors of a quarter of a century ago. While, perhaps, this is partly due to the fact that the phenomenal developments witnessed in the electrical arts during the past twenty-five years have far exceeded those of any other previous period, thus affording the individual more abundant opportunities to gain information in the pursuit of his calling, yet to the circumstance that there is a demand for personal service equipped with knowledge must be really attributed the conditions as stated. It is a matter of congratulation that it is so, for its possession marks an impressive upward and onward movement in the science of electrical engineering.

In the telegraphic field there are more earnest telegraph students than ever before. One evidence of this is manifest in the large and increasing sale of technical books treating on the telegraph. The misfortune of the service, however, is that it does not always derive the benefits of the well informed and trained minds that have matured or are maturing in its employ. Too often for its own good those who have acquired expert attainments, or are developing in that direction, are permitted to retire from the telegraph to accept better paid positions elsewhere, frequently at a time when their services, if recognized, might be of decided practical value.

When the charge is made, therefore, that there are fewer competent telegraph experts in the telegraph employ than formerly, say two decades, or more, ago, the lack is due to the fact that the telegraph has been drawn upon to its own detriment and to the betterment of collateral and allied fields, such as the newspaper service, the telephone companies, the railroads, brokers and others controlling private wire systems. All of these interests, together with others that might be enumerated, are constantly bidding for the best talent that can be found in commercial telegraph offices.

While, then, the commercial offices are in fact schools of learning from which a quota of competent men are turned out each year, yet it must be admitted that the number is after all but a small percentage of the whole. It is unfortunate that more telegraphers are not students. To those who improve the opportunities afforded them to gain knowledge, reward comes in the promotion and advancement to positions of responsibility and greater emolument; in some cases because of their importance, both within and without the telegraphic field, as to fairly astonish their former associates.

Luck is sometimes said to be the foundation of the success that lifts an individual from among his fellows. The utter falsity of such an expression should carry its own condemnation. There is only one road to success in this life, and that is to put one's brains to the best conscientious use possible. There is no room for the lazy man

nor for the indifferent man. Men too often are their own worst enemies. They are simply dishonest to themselves.

Western Union and Pennsylvania Railroad.

The way was paved on December 2 for the taking of the dispute between the Pennsylvania Railroad and the Western Union Telegraph Company to the United States Circuit Court of Appeals, and this will be done immediately. The action was made possible through agreement of counsel for both sides that there should be no more pole-chopping until the case was finally decided.

The Western Union filed in the United States Circuit Court at Pittsburgh an amended bill of complaint against the Pennsylvania Company in regard to its notice of termination of contract given June 2, 1902, and expiring June 2, 1903. This bill complains particularly of the contract between the Western Union and the Pennsylvania Company for rights along the line of the Cleveland and Pittsburgh Railroad. A demurrer to this amended bill has been filed by the defense, and was sustained by Judge Buffington. A decree was also entered by Judge Buffington dismissing the complaint.

There will be no more pole-cutting as both sides wish to get a decision on the matter from the United States Court of Appeals. The decree entered by Judge Buffington places the matter in position to be taken to the higher court.

The merits of the case affecting the lines along the Cleveland and Pittsburgh, the Pan Handle and other connections of the Pennsylvania Railroad west of Pittsburgh, are that both the railroad and the telegraph company are joint owners of the telegraph property and are therefore co-tenants, which the Western Union Company contends is in perpetuity. On the other hand the railroad company, while admitting the co-tenancy, argues that it can be dissolved by one interest purchasing that of the other. The status of the case affecting the Western Union's property east of Pittsburgh is somewhat different. The Western Union Company, while admitting that its lease with the Pennsylvania Railroad Company expired in June, 1902, contended that it had a right under Act of Congress to maintain its pole line along the railroad right of way, which is a post road. To this end the telegraph company brought condemnation proceedings, and asked the court to assess damages for occupancy for its pole line along the railroad's property.

Western Union Wins the Bell Telephone Suit.

The American Telephone and Telegraph Company has decided not to ask for a rehearing before the United States Court of Appeals in the Western Union-Bell Telephone royalty case which was decided in favor of the plaintiff October 7 last, the details of the case being fully explained in our issue of October 16. Counsel for

the American Telephone Company notified counsel of the Western Union Telegraph Company to this effect on December 2. The American Telephone Company had thirty days in which to petition for a rehearing, which was extended by consent of the plaintiff to Dec. 4. The next step in the case will be the appointment of an auditor by the court to determine the payment to be made by the American Telephone Company, or a petition for a writ of certiorari for a trial before the Supreme Court.

Gen. Greely Speaks on Wireless Telegraphy.

"Telegraphy" was the theme of the evening at the meeting of the Methodist Social Union at the Hotel Savoy, New York, on Friday, December 4, Brigadier General A. W. Greely, chief signal officer of the United States Army, interested his hearers with an account of the army's experiments with the system.

"It is not generally known," said he, "but the first successful experiments in wireless telegraphy were performed by the signal corps of the United States Army, before Marconi came here and took up his experiments." He then described in detail the work done under his supervision.

"There is one popular delusion which I wish to speak of," he continued. "That is the idea that messages between two instruments are secret and cannot be interfered with by any other instrument. That is entirely false. By an adjusting instrument a receiver may be syntonized in thirty seconds to take any message whatsoever, whether intended for it or not. I doubt if any message has ever crossed the ocean. A prominent worker in this field showed me a message, popularly supposed to have crossed the Atlantic by wireless instruments, and confessed that he himself received it by cable. It seems to be the general testimony that one hundred miles is about the limit. That can only be done when electrical conditions of the atmosphere are right."

David H. Bates, former president of the Baltimore and Ohio Telegraph Company, then told again the story of "A rebel cipher dispatch that never reached Judah P. Benjamin," which was printed in TELEGRAPH AGE some time ago.

Seeing by Telegraph.

A wonderful contrivance, it is reported from Vienna, has been invented by an electrician of Klausenburg, Austria. It is described as an electrical apparatus which enables a person to sit in a dark room and behold a scene in another part of the town, or in a distant city regardless of intervening obstacles. He asserts that his instrument transmits light waves just as sound waves are transmitted by a telephone.

If you wish to know all about the instruments you work, invest \$1.50 in a copy of Jones' Diagrams.

Howard H. Riggleman at Springfield, Mass.

The new manager of the Western Union Telegraph Company at Springfield, Mass., Mr. Howard H. Riggleman, brings to that important post a versatile telegrapher, a pushing man of business who has had considerable experience for one of his years.



HOWARD H. RIGGLEMAN.

New Western Union Manager, at Springfield, Mass.

Mr. Riggleman was born at Washington Court House, Ohio, on December 5, 1869. His entry into the telegraph service dates from July, 1883, at Jamestown, O. Prior to July, 1889, his telegraph experience was confined to that of the railroad, first with the Cincinnati, Hamilton and Dayton, then the Evansville and Terre Haute, and finally with the Missouri, Kansas and Texas, at Dennison, Tex. Coming East he was given the managership of the joint Western Union and New York, New Haven and Hartford Railroad, at Willimantic, Conn. At this point he remained a little over three years, until December, 1892, when he resigned to travel in the West for the Self-Winding Clock Company. This business not being to his taste, the Postal Company made him manager of their office at New London, Conn., a post he continued to fill from July, 1893, to the fall of 1900. Once again abandoning the telegraph, the automobile business engaged his attention in Ohio, but his love for the telegraph prevailed, returning to which in New York the Western Union Company gave him employment, his assignments being with the "World" and the "Times" newspapers. For a short period he was with The Associated Press. On June 1, 1903, he was given the managership of the office at New Bedford, Mass., from which he was transferred on November 1, to his present location at Springfield, Mass.

Mr. Riggleman's success as a manager may be summed up in the fact that he is able to get business, and that he gives close personal attention to the service, maintaining an intelligent grasp

over the details of his office and extending a highly courteous consideration to the requirements of patrons.

Persian Telegraphs.

A telegram from Teheran states that the Central Persian telegraph line from Kashan to the Perso-Baluchistan frontier was, on October 19, completed as far as Kerman. The line is being constructed by the British Government in accordance with the convention of August, 1901, and consists of three wires carried on iron posts. When completed its total length will be 900 miles, and of these 430 have still to be constructed to take it to the Baluchistan frontier.

The New Western Union Manager at Atlantic City.

George W. Deetz, who, on December 1, assumed charge of the office of the Western Union Telegraph Company at Atlantic City, N. J., is a native of Philadelphia, where he was born on November 29, 1867. His entire telegraphic experience has been acquired in the Western Union service, which he entered as a messenger in the Quaker City in 1882. Advanced to a clerkship, he held various clerical positions in the main office in that city during the period from 1884 to 1886. In the latter year he was appointed night operator in the office at the Broad Street Station, succeeding to its managership in 1887. The following year he was transferred as manager to a Philadelphia uptown branch office. His work here was so satisfactory that in 1892, at twenty-



GEORGE W. DEETZ.

New Western Union Manager, at Atlantic City, N. J.

five years of age, he was made manager of the same interests at Camden, N. J. Here he remained for eleven years when his transference to Atlantic City, as first above stated, was made, a fitting promotion for one who has demonstrated his worth.

Wind Pressure on Telegraph Structures.

BY FRANCIS W. JONES.

It is a foregone conclusion among far-sighted telegraph and telephone managers, that economy of construction and maintenance, and a maximum traffic value with a minimum interruption of wires, can only be secured by the observation of advanced engineering rules, and the transfer of the erection and care of telegraph and telephone systems from the hands of empirics, to the hands of competent engineers, both mechanical and electrical.

In view of the great obstacles that exist to the economical and proper maintenance of lines in this country, it may be that engineers cannot at present do all that would be possible under favorable conditions, yet, the greater the difficulties, the more necessary is the trained directing mind. It is at once a serious and grotesque situation when private corporations investing capital and employing a very high grade of skill to perform a public service so indispensable to the whole country, should be legislated against and heavily taxed in every State in the Union, held to strict account by every court, frequently mulcted in enormous damages for errors that cannot be avoided, and denied by cities, towns and villages, a reasonably free and unobstructed use of the highways for wires which are daily necessarily multiplying in number to meet the public wants, so that it really seems that the telegraph and telephone, the two greatest friends of our commercial and social life, not only do not receive a solitary bit of encouragement, neither municipal, State nor Federal, but are taxed, hampered and thwarted to the point of desperation, while at the same time, the Government and the public are becoming daily more imperious in their demands for the lowest rates and the best service.

Highways are filled with trolley and electric light poles and ornamental trees. Railways are crowding out such lines of poles as they have been able to accommodate in the past, to make room for more tracks, and the long-distance underground problem is so vast, both from financial, electrical and engineering considerations that it staggers the telegraph and telephone managers.

One of the first things to be considered is the effect upon poles and wires of the wind which, next to decay, is the cause of a large per cent. of interruption, delay of messages, and expense, the latter including the wages of idle operators and clerks, besides cost of repair.

There has been no uniform agreement among those in charge of line construction as to the force exerted against cylindrical poles and wires by the wind.

Professor S. P. Langley, who stands very high as an authority, states that the resistance experienced by a plane surface exposed normally to wind blowing at various velocities, may be calculated from the following formula:

R, resistance in pounds = $K A V^2$.

K, constant found by experiment = 0.00166.

A = area in square feet of one side of the plane.

V = velocity in feet per second.

Professor Langley states that the resistance encountered by a cylinder in wind normal to its side, is one-half the resistance which would be encountered by a plane exposing an area equal to its longitudinal section, but that account should be taken of the fact that small wires, cords, ropes, etc., have been found by experiment to cause a resistance of from five to ten times what would be calculated, as per above formula, from their normal sections.

In England, Mr. John Gavey, the engineer-in-chief of the British Telegraphs, calculates the strength of the average structures and wires to withstand, at right angles to the wind's direction, a pressure of 17 pounds per square foot, and takes two-thirds of the diameter into the length of the round poles and conductors as the approximate area affected. The British table of wind pressure requires a velocity of 60 miles per hour to equal 17 pounds per square foot. Whereas, the following table furnished by Prof. C. F. Marvin of the United States Weather Bureau, shows that the wind requires a velocity of 85 miles to equal 17 pounds:

Table of Wind Pressures.

Wind Velocity Miles per hour	U. S. Weather Bureau		British Table		Prof. Langley's	
	Lbs. per square foot	Lbs. per square foot	Lbs. per square foot	Lbs. per square foot	Lbs. per square foot	Lbs. per square foot
20	1.27	1.07	1.07	1.42	1.42	1.42
30	2.04	1.71	1.71	2.25	2.25	2.25
40	2.81	2.35	2.35	3.08	3.08	3.08
50	3.58	3.00	3.00	3.91	3.91	3.91
60	4.35	3.64	3.64	4.74	4.74	4.74
70	5.12	4.29	4.29	5.57	5.57	5.57
80	5.89	4.93	4.93	6.40	6.40	6.40
90	6.66	5.58	5.58	7.23	7.23	7.23

Mr. Oldbury Burne of the Indian Government Telegraphs, Calcutta, states that experiments he made by swinging a plate of 12" by 6" and a cylinder of 4" diameter, both of exactly equal weight, and lengthening the extensible cylinder until both plate and cylinder attained the same amplitude of swing, giving the length of cylinder equivalent to the plate between 33 and 35 inches. Area of one side of plate 72 inches, and area of section of cylinder 33" by 4" = 132 inches and 35" by 4" = 140", former giving $\frac{2}{3.67}$ and latter $\frac{2}{3.89}$ or .545 and .515. In India two-thirds of the diameter multiplied by length is used to calculate the wind pressure area of poles and wires.

Wind Surface of 1 Mile of Wire.

B. W. Gauge No.	Diameter In.-h	Area of 2/3 of diameter in feet	B. & S. Gauge No.	Diameter Inch	Area of 2/3 of diameter in feet
4	.238	69.8	7 1/2	.138	40.5
6	.203	59.5	9	.114	33.4
8	.165	48.4	10	.102	29.0
9	.148	43.4	12	.08	23.8

Kernot, of Melbourne, demonstrated by experiment with heavy air blasts that the pressure at right angles on a cylinder was about one-half on a flat surface of equal diameter, and that the pressure on one side of a cube was only .9 of that of a thin plate of equal area.

Telegraph structures and wires must be de-

signed not only to withstand the maximum ordinary wind pressures to which they may be subject, but also to resist the sudden gusts which are far more destructive than a steady high wind velocity. The extra weight and wind surface of clinging sleet and snows to poles, arms and wires, and the areas offered by pins and cross

Wind Surface of Poles.

Length above ground, feet	Mean Circumference, inches	Area of 2/3 of diameter, feet	Mean Circumference, inches	Area of 2/3 of diameter, feet
20	27	9.54	30	10.59
30	30	15.91	34	18.01
40	35	24.73	38	20.88
48	38	32.24	41	34.70
58	42	43.06	45	40.15

arms to the wind must not be overlooked.

A cubic foot of ice at 32° weighs 57.5 pounds, so by taking the average circumference or diameter of an ice-coated wire between two poles, and calculating its cubical contents in feet, then deducting therefrom the cubical contents of the wire, the weight of ice is readily ascertained.

An Electromagnetic Theory of the Aurora Borealis.

In a paper previously read before the French Academy of Sciences, C. H. Nordmann showed by means of theoretical considerations that the sun must emit Hertzian waves, the intensity of which is a maximum in the regions, and at times, of greatest solar activity. From this proposition an explanation of the solar corona and its peculiarities as well as of the spectra of comets was derived. In a recent note presented to the Academy, the author, says the "Scientific American," tries to show that the same explanation would elucidate the nature of the aurora borealis, as well as the origin of the oscillations and disturbances of terrestrial magnetism. Previous investigations have shown a close connection between the spectrum of the aurora borealis and that of the light surrounding the cathode of a tube containing oxygen and nitrogen; it is hence inferred that the aurora borealis is a cathodical phenomenon occurring in the upper exhausted atmosphere. Some special properties of the aurora borealis are explained by the well-known property of cathode rays to orientate themselves along the lines of force of a magnetic field. As regards the only difficulty left by the explication, viz., the origin of the cathodic phenomena giving rise to the aurora borealis, the author is able to resolve this question by means of the above proposition.

Tubes containing sufficiently exhausted gases will, as shown by Elbert and Wiedemann's work, become illuminated under the influence of Hertzian waves, the luminous phenomena thus produced being accurately identical with the cathode phenomena of Geissler tubes. The author therefore thinks auroræ borealis are caused by cathodical phenomena produced in the atmosphere under the action of the Hertzian wave emanating from the sun, according to the well-known property of these waves.

On this explanation, the different periods of the auroræ boreales will easily be accounted for; the fact that the greatest frequency of the auroræ coincides with the greatest frequency of sun spots is due to the greater intensity exhibited by the Hertzian wave given off from the sun during the maximum of sun spots. The undecennial period of the auroræ seems to correspond with the period of synodical rotation of the sun; that is accounted for by the fact that the regions of maximum activity of the sun performing a complete rotation in about 26 days, the aurora borealis must of necessity possess an identical period. The diurnal period of the phenomenon is equally explained by this theory: though the maximum production should correspond with the maximum of solar radiation in a given point, i. e., to the passage of the sun through the meridian, the apparent maximum of the auroræ cannot be observed until in the early hours of the evening, in accordance with experimental facts, as the brilliancy of daylight at the instant of the real maximum will hide the phenomenon.

The oscillations of the magnetic needle, as is well known, exhibit an undecennial period, closely corresponding to the period of sun spots, like that of aurora borealis. It thus seems as though the variation of terrestrial magnetism should be due to the same cause as auroræ boreales. On the other hand, it is generally presumed that the intensity of terrestrial magnetism and the variations of this intensity are in close connection with the general electric current of atmosphere, produced mainly in the upper exhausted layers of atmosphere, being relatively conductive, under the influence of the unipolar induction of vaporization. Prof. Righi has finally shown the conductivity of an exhausted gas tube to be notably augmented under the influence of Hertzian waves, the tube thus behaving like a coherer. Now the theory of the author will readily account for the undecennial period of terrestrial magnetism; at the time of the maximum of the spots, the more intense Hertzian waves of the sun will give rise to a relatively high diminution in the resistance of the upper atmosphere, resulting in an increase in the intensity of the electric currents of atmosphere, and accordingly in an increase in the intensity of terrestrial magnetism.

The accidental and instantaneous production of auroræ boreales, as well as the variations in the intensity of terrestrial magnetism, may equally be explained on the theory of the author. Many examples are known of magnetic thunder storms attended by auroræ boreales and coinciding with a violent disturbance of a solar spot, as detected by means of the spectroscope. The best instance for the truth of this theory is, however, derived from the fact observed by Young, as far back as 1883, that any considerable disturbance of the solar surface will be transmitted to our terrestrial magnetism with the speed of light. Now this is just the velocity of Hertzian waves.

Government Telegraph Codes.

BY WALDRON FAWCETT.

(Reprinted from the Boston Herald).

Recent disturbances which have endangered American interests in various parts of the world—in Panama, in Turkish domains, and in the Far East, have proved more conclusively than ever before the great value of those codes and ciphers whereby the United States Government communicates confidentially with its army, navy and diplomatic officials in all quarters of the globe. Indeed, were it not for these mysterious vocabularies which render unintelligible to prying, unfriendly eyes the secret orders of the officials at Washington, Uncle Sam would find his every move in the game of world affairs anticipated and checkmated. Neutral but rival nations would “steal his thunder” and unfriendly powers would be enabled to thwart all his plans.

A telegraphic code, it may be explained, is simply a vehicle for saying things in a few words. The Government has no monopoly in the use of the scheme. Codes have been employed for years past in the conduct of all kinds of business which requires frequent and speedy long distance communication.

The average business man's object in using a code is not so much to preserve secrecy regarding his transactions—although that may be a consideration—as to save money. It is evident that if a man, in telegraphing or cabling, can make each word in his message represent to the recipient a group of words, or perhaps a whole sentence, he can save a vast amount of money, since telegraphing and cabling are both charged for on the basis of so much per word, and in cabling the cost is frequently several dollars per word.

With Uncle Sam the question of money saving is a matter of importance, since the Government sends vastly more messages than any business firm, and pays for them just as would a private citizen, but the Government officials set even more store by the plan of using codes, because the words and letters and figures with hidden meanings enable them to communicate with Government agents in any part of this or any other country without outsiders being any the wiser as to what is being said by either party in the long-distance conversation.

In the business world, where codes are used because they enable a cutting down of the number of words in telegrams, and a consequent saving of money, almost every person employs one of the universal codes, but, of course, Uncle Sam, who has state secrets to protect, cannot risk using signs and symbols, the meaning of which is known to so many people, and consequently each of the principal departments of the Government has one or more codes of its own for its exclusive use.

Thus the State Department has a code, the Navy Department has a code, the War Department has three codes, and so on through the list of branches of the Government, while the Presi-

dent of the United States has the most secret code of all—that is, the code whose meaning is known to the fewest people.

Some of the Government codes are made up of words, letters, or combinations of letters, but Arabic figures are in most instances preferred, as they are more mystifying. Figures are more difficult for the telegraph operator to handle than are words, but on the other hand, if an error is made in the transmission of a cipher despatch made up of figures, the flaw can usually be detected and things set right at the receiving end much more quickly than in the case of a similar mistake in a code message made up of words.

Another objection to the use of words is that the real meaning of a word is liable to become confused with the hidden meaning, to the embarrassment of somebody concerned.

For instance, let us suppose that the Navy Department had a word code wherein the word “ammunition” meant “Send me a new flag.” Under such circumstances a naval officer at a port where trouble was threatened might send a message which, while in reality nothing more than a simple request for a new flag, would on the face of it sound decidedly suspicious to persons who were not aware that the message had a hidden meaning.

For this reason an effort is made where words are used for code purposes to select specially coined words such as “gabbazoo,” which have no real meaning outside their code significance. Sometimes in writing a message in code words an officer will sprinkle in at intervals a few words which have no hidden meaning, but are to be taken at their face value, as it were. This plan may be resorted to when an officer wishes to use some word or phrase for which there is no counterpart in the code, or it can be employed as a means of putting additional obstacles in the path of any unauthorized person who might seek to figure out the cloaked meaning of the message.

Since the writing of a code message or the interpretation of one is very much like translating from English into a foreign language or vice versa, it goes without saying that the one indispensable adjunct of the officer who wishes to send or receive code messages is the precious code book, which corresponds to the foreign-English dictionary of the American who is learning a European language.

These code books are guarded with the utmost care, since if one fell into unfriendly hands the possessor might be enabled to learn many of Uncle Sam's secrets. At the departments a careful record is kept of every code book issued, and the officer who receives it is held strictly accountable for its safe keeping. Should one of these treasured books be lost or stolen, it would probably be necessary to hastily arrange an entire new code to take the place of the one no longer inviolate.

Whereas a code despatch can be translated by any person who is in possession of a code book

and understands its use, there is another way to redouble the precautions for the preservation of secrecy in the transmission of messages, namely, by the use of cipher; and this is frequently resorted to in several of the departments, notably the War Department.

The use of cipher is an intricate and complicated operation, not readily comprehended by the uninitiated; but in a general way it may be stated that in cipher work instead of code work, which is transmitted standing for the expression appearing opposite it in the code book it typifies, through the employment of a key number and expression, a given number of words in advance of or beyond the word in the code book seemingly indicated. In cipher work, knowledge of the key number is the key to the situation, and this key number is frequently changed.

In a way, the most interesting of Uncle Sam's secret communicative system is the President's private code, which is known to only three men—President Roosevelt, Secretary to the President Loeb and Col. B. F. Montgomery, the President's "intelligence officer," who is in charge of the telegraph and cipher bureau of the Executive Mansion.

Prior to the Spanish-American War, the President of the United States had no personal code, but merely depended upon one or another of the regular department codes. When, however, the conflict with Spain made necessary the utmost secrecy in the transaction of Presidential business, Col. Montgomery suggested to the late President McKinley that a private code for the Chief Executive be prepared, and one was accordingly formulated.

The President's code is used only for communications passing between the White House and the President when the latter is absent from Washington, and the last question usually put to Secretary Loeb as he and the President leave the White House for a journey is, "Are you sure you have the private code book?"

The Navy Department has a code of which it is very proud. In speaking of it, Lieut. Belknap, the code officer of the Department, said: "Our code has been in use for a number of years, and we believe that it is absolutely indecipherable. The utmost precautions are taken to so guard it that no information regarding the code can become public." A branch of the Government which uses a code extensively—but solely to save expense and not to insure secrecy—is the United States Weather Bureau. The weather reports from all parts of the country are sent to the main office at Washington in code form, and inasmuch as a single word, such as "oblige" stands for a whole phrase, such as "weather cloudy; rain probable," it will readily be seen that the scheme saves Uncle Sam many pennies.

In the State Department, where there is much code work of a very important nature, the responsibility for making up and translating the code messages going to or received from our

ministers and ambassadors in all parts of the world falls upon Assistant Secretary Adee and Col. Michael, the chief clerk.

To be a good "code man" requires ability of no mean order. Thorough familiarity with the English language is necessary; a good memory and some knowledge of telegraphy. Even the most expert code workers sometimes have great difficulty in figuring out the exact meaning of a message.

At the time of the Boxer revolt in China, Col. Montgomery worked for six hours to obtain the correct interpretation of one mystifying word in the first message received from Minister Conger, who was a virtual prisoner in the legation at Peking. This was a trying time for all the code men in the Government service. The Chinese operators seemingly purposely jumbled up the code messages, and the receiving officials in Washington had not only to translate the words of the messages, but rearrange the words and phrases so that they would make sense.

The Alaska Telegraph Lines.

The next few months will see the completion of the cable line between Seattle and Alaska. It was hoped to lay the cable from Puget Sound to Juneau, the important mining and commercial town on the mainland northeast of Sitka, before the end of this year; but owing to the delayed arrival on the Pacific Coast of the steamship carrying the cable to San Francisco, the work will not be completed till next April.

The cable was authorized by Congress on March 3, last. The entire 1,300 miles of it was manufactured near this city, transported around Cape Horn and delivered at last at San Francisco after a voyage of 16,000 miles. The complicated machinery to handle the cable and the delicate instruments necessary to operate it were planned by the Signal Corps, made to order in Great Britain and delivered in San Francisco. The route from Seattle to Sitka was surveyed by Capt. J. F. Pratt, of the Coast and Geodetic Survey. All this work, done in seven months, from March to the end of September, is a great achievement.

The War Department has issued a map prepared under the direction of Brigadier General Greely, Chief Signal Officer, showing the cable lines in Alaskan waters that have been completed, those that are proposed and will be carried out next year, the telegraph lines completed in the territory and the British Columbia land line to Dawson and Eagle which connects through the Canadian Pacific Railroad station of Ashcroft with the United States. By means of the Canadian telegraph and the completed lines in various districts of Alaska we are already in electric communication with parts of the territory.

TELEGRAPH AGE should go regularly to every one interested in the telegraph. Write for a sample copy.

Flow of Electricity in the Earth.

[So much has been said and written concerning the flow of electricity in the earth, by members of the profession in this country as well as those abroad, particularly in Australia, and as the subject is one of absorbing interest, we herewith print what Prof. John Trowbridge, an eminent authority of Harvard University, has to say on the subject, in his book entitled "What is Electricity?"—Editor.]

In the following chapter let us examine the passage of electricity through the earth; for it is well known that it was discovered in the early days of telegraphy that a return wire between Boston and New York, for instance, could be dispensed with, and that the earth could be used instead of the return wire, thus halving the injurious resistance of the circuit; for it was found that the earth did not oppose any appreciable resistance compared with the total length of the telegraphic circuit.

We can find no analogy between the flow of steam, gas, or water and the case of the return circuit through the earth. In the case of steam, gas, and water, and of all fluids forced through pipes from a power house, nothing returns to the power house if we should connect the pipes to the ground; for the steam would be condensed, the air pressure lost, and the water would soak into the ground. In the case of electricity, however, nothing is lost by connecting the wires leading from the power house or battery to the ground. Indeed, in certain cases a great deal is saved, for the energy of the current is not dissipated into heat along a return wire. We have said that a magnet or compass needle instantly points to a wire through which an electrical current is passing. It is like the finger of a mute person pointing out a secret. It points to the wire if it is moved along the wire from one earth plate to which the wire may be attached to the power house or battery, and from the power house or battery to the earth plate at the other end of the wire circuit. If placed on the earth between these earth plates and sufficiently far from the overhead wire—on the ground, for instance, beneath an ordinary telegraph wire strung on poles—the compass or magnet is quiescent and performs its normal task of pointing to the poles of the earth. It gives no evidence of an electric current in the ground; the electricity, so to speak, seems to have leaked away like water. Yet instruments show that the current apparently flows to the ground and returns from the ground to the power house.

If we should take a miniature earth—a globe of metal, for instance, several feet in diameter, and run an electric current to what may be called the north pole of such globe and lead it away from the south pole, we shall find that the current apparently spreads out from the north pole and converges, so to speak, to the south pole. If the globe were 20 feet in diameter very little indication of a current would be obtained around the equator of such globe. Let us now build up a

globe made of steam or water pipes all connected to one main pipe at the north pole and again at the south pole. We can suppose the pipes to represent the divisions of an orange. When steam or water leaves the main pipe and is divided in its flow equally among the pipes, placed similarly to the divisions of the orange; the amount of flow through any one pipe can be made very small, although the flow through the main pipe leading to the globe is very large. If we should connect any two neighboring pipes along the equator so that water or steam could flow from one to the other, we should find that there would be no flow, for the pressure at the two ends of such a connecting pipe is the same; there is no difference of pressure to force the steam or water from one pipe to the other. If, however, we should connect one pipe at a point on the equator—in Africa, for instances—with another pipe at a point corresponding on the globe to New York, there would be a flow in the connecting pipe, for there would be a difference of pressure. In the case of electricity, a telephone will determine whether there is a flow from one portion of the earth's surface to another when we lead an electric current into the earth and out of it. Let us use the telephone at first merely as a detector of an electrical flow, just as we used in the above illustration a pipe connecting two pipes in order to determine whether there is any possibility of a flow of water between them. That it can be so used we can easily ascertain, for we hear a click in the telephone whenever we touch the two wires leading to it to the two poles of an ordinary battery such as is used on bell wires or for medical purposes. If we should hold a telephone to the ear and connect one of its leading wires to the rail of an ordinary electric road and the other to the iron posts which run beside the track, we should hear a click at the moment of making the contact with the iron pole if there is a leakage of electricity from the overhead wire, which is supported by the iron pole and its connections, into the ground. In other words, a difference of electrical level would be shown between the iron post where it enters the ground and the rail. If now we should make a globe of a number of copper wires, insulated from each other and forming the meridians of such a globe, and connect all these great circles of copper wire together to one wire at the north pole and to another wire at the south pole, and lead a current of electricity into the collection of meridian wires at the north pole and out of the collection at the south pole, we should find that very little current would go through any one wire; and if we should connect our telephone wires with two neighboring wires anywhere along the equator we should hear no click; there is no flow of electricity between points of the same pressure. If, however, we connect one wire of the telephone at one point on the equator and the other wire at a point on the wire globe corresponding to New York, we should hear a click, for there would be a flow between these points.

From such experiments we see that what we call the electric current flows out in all directions from the point where it enters the earth, and appears to converge again to the point where it leaves the ground to enter the wire and to return to the power house or battery. Perhaps the best illustration of the manner in which the electric current spreads out in the earth is afforded by a method of telegraphing without wires, which I described in the Proceedings of the American Academy of Arts and Sciences, and which has lately been repeated by Prof. Rubens in Berlin, and by Mr. Preece of the London telegraphic system.* In my paper I remarked: "The theoretical possibility of telegraphing across large bodies of water is evident from this survey which I have undertaken. It is possible to telegraph across the Atlantic Ocean without a cable. Powerful dynamo-electric machines could be placed at some point in Nova Scotia, having one end of their circuit grounded in Florida, with an overhead wire between these points of great conductivity and carefully insulated from the earth except at the two grounds. By exploring the coast of France two points not at the same potential could be found, and by means of a telephone of low resistance the Morse signals sent from Nova Scotia to Florida could be heard in France."

What we have said in regard to the spreading out of the electric effect or current in the earth is entirely applicable to the case of the human body. If one pole of a battery or other source of electricity is applied to the middle of the back and the other pole to the middle of the breast, the electric current which is thus led into the body spreads out like a stream of water through an infinite number of fine holes in a rose jet; it permeates every muscle in a greater or less degree between the back and the breast. Its flow can not be detected in the body by a telephone, but a delicate galvanometer, which is the electrician's microscope, will show its spreading. Not only can the spreading of the current be detected by galvanometers, but this action can also be studied by chemical analysis, as we shall see when we study the passage of electricity through fluids. Before going further in the subject of the earth circuit we can already perceive that the use of the earth for a return is not always desirable, for in the neighborhood of a great city the earth becomes filled, so to speak, with the electrical flow from the common use of the earth by the telegraph companies. At one time, as I have shown in the article already referred to, it was possible to adjust one's watch by connecting a telephone to the water pipes and gas pipes in almost any part of Boston and Cambridge, for one could hear the clicks of the observatory clock from which

*My original researches were made between the observatory at Cambridge, and the city of Boston, which were connected by a time signal wire. The current upon this wire was broken by a clock at regular intervals. I found that I could hear the clock-beats a mile away from the wire by connecting a telephone to a wire and by grounding the ends of the wire 500 or 600 feet apart and parallel with the time circuit.

time signals were sent. The telephone companies no longer, however, use the earth for a return circuit on their long-distance lines, and employ an entire metallic circuit of copper wire. This circuit obviates the earth disturbances due to the spreading out of electric circuits; it has also other advantages, which we will study later. It is interesting to observe here that what was once considered a notable practical advantage in telegraphy is fast losing its importance as we refine upon our methods of transmitting intelligence by electricity. We shall also see that the earth is no longer used by the electric light and power companies. We shall see further that what we call the steady current is being replaced by the unsteady current, or the to-and-fro current for the electrical transmission of power over great distances; and, still stranger, we shall perceive that there are reasons for believing that there is no electric current or flow of electric energy on the wires which are conveying telegraphic messages or propelling electric cars; and that for very rapid alternating currents copper is really a poor conductor, and glass an excellent one.

There are several terms now in common use in electrical science which serve as measures of value, and I shall endeavor to give a popular explanation of them. The term ampere is used to denote the strength of the electric current; the word volt, to denote the unite of electro-motive force or electrical pressure on the circuit. The current may be said to flow under a head, which is termed the voltage. This head is analogous to a head of water which forces a current of water through a pipe. The quantity of water which flows through the pipe in a unit of time—say a second—is a measure of the flow of water; the quantity of electricity which flows in a second of time is a measure of the electrical flow, and is called an ampere. This flow meets with a certain electrical resistance which is termed an ohm. The flow of water, also, through a pipe meets with a resistance in the friction with the pipe. These terms—ampere, volt and ohm—have passed into daily use. They perpetuate the names of a great Frenchman, a great Italian, and a great German. There are two other terms, not so readily comprehended by fluid analogies: The farad, named for Faraday, the unit of electrical capacity, the unit of electrical quantity we can store up; and the henry, named for the great American Joseph Henry, the unit of inductance or electrical inertia—an inertia which manifests itself when a current suddenly rises or falls. These two terms—farad and henry—have immense importance in the subject of alternating currents of electricity.

The Western Union Telegraph Company has recently purchased the Ohio River telegraph lines which run from Benwood to Kenova, Clarksburg to New Martinsville, in West Virginia, and from Spencer, Ohio, to Ravenswood, W. Va., a total of 309 miles.

Sketches of Some of the Champions of the Philadelphia Tournament.

RICHARD CLEMENT BARTLEY.

Richard Clement Bartley, of Philadelphia, winner of the first prize in the recent telegraph tournament held in that city, is the assistant chief operator in the Pennsylvania Railroad telegraph office, Broad Street Station. Mr. Bartley was born at Dillerville, Pa., October 3, 1874. To use his own phrase he "picked up" telegraphy, and obtained a position as operator on the Philadelphia division of the Pennsylvania Railroad, on June 25, 1889. There he worked as an extra operator in the block towers between Harrisburg and Philadelphia. On September 1, 1890, he went to Pittsburg where he found employment still with the Pennsylvania road. Returning to Philadelphia he entered the service of the Western Union Telegraph Company on January 15, 1891, but because of a reduction in the force his commercial



RICHARD C. BARTLEY, OF PHILADELPHIA.

term soon ended, and in November of that year he went back to the Pennsylvania road, being stationed as an operator at Altoona, Pa., working in the yard and in the general superintendent's office, remaining there until October 18, 1893. Once again going to Philadelphia he worked in various positions, still for the same road, until June 1, 1900, when he was transferred to the general offices, and where on September 1, 1903, he was promoted to be assistant chief operator, in which position he has full charge of the wires and handling of the telegraph business of the office from 11.30 P. M. until 7.30 A. M.

JOSEPH P. GALLAGHER, OF NEW YORK.

Joseph P. Gallagher, of New York, a winner in the Philadelphia telegraphic tournament, where he secured the first prize in the Yetman Transmitter class, receiving; and the first prize in receiving commercial messages on a typewriter in the thirty minute trial, was probably the

youngest man who entered that memorable contest. He was born at Hartford, Conn., September 9, 1883, and consequently only recently passed his



JOSEPH P. GALLAGHER, OF NEW YORK.

twentieth birthday. He obtained a rudimentary knowledge of telegraphy in his native place, but his entry into the service was deferred until March, 1898, when he entered the Western Union employ in New York. He held main and branch office positions with the Western Union and Postal telegraph companies; has had newspaper assignments, and for a time was employed in a special capacity by Mr. Charles E. Yetman, of the Yetman Transmitter. Mr. Gallagher is now employed as an operator at the main office of the Postal Telegraph-Cable Company, New York.

CHARLES P. WEST, OF NEW YORK.

Charles P. West, of New York, a member of the force of the Postal Telegraph-Cable Com-



CHARLES P. WEST, OF NEW YORK.

pany, and the winner at the telegraphic tournament at Philadelphia, of the first prize in the Yet-

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FOR TWENTY-ONE YEARS *Telegraph Age* has represented the great telegraphic interests of this country. During this long period, so eventful in the history and development of telegraphy, this paper has endeavored faithfully to advance the welfare of every individual connected with the telegraph. How well this has been appreciated is attested by the fact that thousands of names are still on its books of those who, having drifted into other callings, never have forgotten their former telegraphic experience, or ceased to cherish the friendships and associations then formed. For telegraphers are clannish, loyal to each other and, we are pleased to say, eminently so to their single representative paper, and which let it be said, has ever sought to be loyal to them.

THE DEPARTMENT OF CORRESPONDENCE, so long finding expression in the familiar and chatty pages by which members of the fraternity in all parts of the country are kept constantly and pleasantly informed of all changes and transfers, business and social events, marriages and deaths, occurring within their ranks, has proved to be of abiding interest to thousands everywhere.

THE TECHNICAL ARTICLES, highly instructive in character and conveying practical and much-needed information on every phase of modern telegraphy, have won high commendation because of their intelligence and the broad scope of the subjects brought under discussion. They have been invaluable to the active operator as a practical aid in his daily employment. The series of articles now being contributed by Willis H. Jones, to which attention is especially requested, are alone worth many times the subscription price of the paper. Mr. Jones is a prominent New York wire chief operator. His articles explain, in simple and easily understood language, the duplex, quadruplex (how to install and balance them), batteries, dynamo machinery, the condenser, galvanometer and electrical testing, switchboard testing, repeaters of all kinds, etc. All sorts of possible combinations that the telegrapher is asked to solve are given painstaking and careful attention.

THE GENERAL SUBJECT OF TELEGRAPHY in its many aspects, its progress and development, in this and other countries, has been so treated as to present a vast fund of information. The bound volumes of *Telegraph Age* have come to be regarded as works of reference. They will increase in value as time goes by. The very full and comprehensive cross index published each year, is a most useful supplement to the paper.

THE PROGRESSIVE CHARACTER of the paper itself is generally recognized, and its influence and high standing in all telegraphic and allied electrical circles is freely acknowledged.

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man Transmitter special sending event, consisting of \$50 in cash and a Yetman transmitting instrument, is a native of Virginia, where he was born at Howardsville, January 25, 1876. His first telegraphic work was as a relief operator, where he was also agent, for the Chesapeake and Ohio Railway Company on the James River Division, in Virginia. His railroad work took him to different points on the system until 1896, when he was transferred to the general offices at Richmond, Va. In 1898 he resigned in order to accept a position with the Postal at the Virginia capital. In 1900 he came to New York where he has since remained in the employ of the Postal Telegraph-Cable Company at its main office, 253 Broadway.

English Post Office Telegraph Promotions.

On the subject of the technical qualifications required by candidates for promotion to the rank of superintendent or assistant superintendent of the English Post Office telegraphs, says the London Electrician, notification is made that from June 1, 1904, the subjects of examination will be revised. Before promotion to either of the above ranks officers must pass a qualifying test as follows:

1. Crossing and looping wires with facility and certainty.
2. Tracing and localizing faults in instruments.
3. Tracing and localizing permanent and intermittent earth, contact and disconnection faults on wires.
4. Methods of testing the E. M. F. and resistance of batteries and a general knowledge of the essential features of the various descriptions of batteries.
5. System of morning testing, both as regards sending and receiving currents, with the necessary calculations in connection with the same.
6. Making up special circuits in cases of emergency.
7. Joining up and adjusting single-needle, single-current and double-current Morse, both simplex and duplex, and Wheatstone apparatus.
8. Fitting a Wheatstone transmitter to an ordinary key-worked circuit.
9. Measuring resistances by the Wheatstone bridge.
10. A general knowledge of telephone switchboards and of trunk line working.

Officers who have attained the rank of assistant superintendent or superintendent without passing this examination will be required to do so before promotion to higher superintendentships. It is, therefore, to the advantage of the staff to take timely steps to qualify in technical knowledge, as vacancies cannot be kept open merely to enable candidates to gain knowledge they should have already acquired. Officers who fail to pass will not be eligible to be re-examined, at their own request, until one year has elapsed. Officers

whose technical certificates are more than two years old at the date of their promotion are liable to be required to undergo re-examination. Possession of the technical certificate only proves the holder to be qualified for promotion so far as technical knowledge is concerned, and does not commit the department to select him for promotion at any time.

On Arc Lamp Rays.

The system of transmitting telephone messages by means of the rays of an arc lamp, which was developed by Ernst Ruhmer, has been extended to the transmission of telegraph messages, in which work it is thought that it will compete with the heliograph. In the telephone system devised by Ruhmer the sound waves of the voice are changed into electrical waves by means of the microphone, and these waves are used to vary the intensity of the current passing through an electric arc. Variation of the current caused a corresponding variation in the intensity in a ray of light which was projected to the receiving station, where it was received upon a suitable reflector and thrown upon a selenium cell. The variations in the light received changed the resistance of the selenium cell correspondingly, and thus were made to reproduce the original sounds in a telephone receiver. In the present system the action is practically the same, except that the variations in current are caused by means of a telegraph key, instead of a telephone transmitter. In this way the Morse signals are sent out and are received in practically the same way as in the telephone systems. It is thought that this system will be particularly useful for military purposes, where secrecy is desired, as the variations in light cannot be followed by the eye or with a telescope, but can only be detected with a proper telephone receiver.

Another Printing Telegraph System.

Wilhelm von Siemens, of the Siemens-Halske Company, exhibited on November 24, at Berlin, Germany, before an audience of postal and telegraph experts a new telegraphic apparatus on which he and Dr. Franke, Dr. Thomas and Dr. Ehrhardt have been working for several years.

Perforated paper ribbon is used in the apparatus and the experiments show that the instrument sends 2,000 words per minute for long distances.

The message is received on a strip of sensitized paper which emerges with the letters fully developed. The German post office authorities also have made experiments with Poulsen's telegraphone, which combines the use of the ordinary telephone with the telegraph instrument.

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The current information of any office will, if carefully chronicled, furnish a welcome digest of news that will be read with pleasure and satisfaction by thousands, and this limit should constitute the legitimate contents of all letters. And we wish that our correspondents would avoid the too frequent habit, at all times a bad one, of abbreviating words in writing. This is a peculiarity among telegraphers, we know, but what may be plain to the writer, and for local interpretation, is usually a mystery to the editor, and is apt to lead to error in the printed statement.]

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D. A. Mahoney, Special Representative, Western Union Telegraph Company, Philadelphia.

WESTERN UNION.

E. W. H. Cogley, a well known old timer, has been appointed manager at Lewistown, Pa., vice Miss Deasey, transferred to Philadelphia.

Miss McDaniel, has been transferred from Bordentown, N. J., to Burlington, N. J., as manager.

Joseph Dolphin is confined to his home with a severe case of grippe.

David White, a well known branch office manager, died recently after a short illness.

D. J. Burns was sent to Mt. Holly, N. J. to handle press matter during the recent murder trial at that place.

Anticipation and expectation run high regarding our new office. A great and pleasant surprise awaits us judging from present reports and indications.

Charles Beckworth, has been transferred to the money order window, and Harry Cosgrove to the position of time clerk. Both young men are proving themselves worthy of their advancement.

POSTAL.

Our messenger boys are at their best, everybody sees them; their activity is obvious—Christmas is nigh.

Among the operators, prospects of a trip home hold out pleasant inducements to many, which we earnestly wish to see realized.

Business has taken the annual slump, extra, consequently, is at a premium.

We learn with regret of the illness of Mr. Ed. Hibbs, of the Dock Street Market office.

Mr. R. C. Makin has resigned. Miss Hannah Bronnahan, a former employee, was a welcome visitor.

The Messrs. Robt. Robinson, of Lancaster, Pa., accompanied by Mr. F. K. Holtzinger, of this city, were called to New York recently on a business trip.

The staff of operators at the office of the Philadelphia Press are availing themselves of the convenience of a Yetman machine.

Due to the severe felon on a finger Mr. Roscoe Smith was obliged to relinquish his place on the first New York bonus wire. Mr. Albert Weiss, a former incumbent, has been re-assigned to this circuit.

ST. LOUIS, MO., WESTERN UNION.

The annual ball given by the telegraph operators of the Western Union, in this city, under the management of Mr. Joseph Barry and Mr. Ray Alger, Friday evening, December 4, at Louisiana Hall, was a great success, almost every operator employed by the Postal and Western Union companies and by private firms were present. The hall was decorated with flags and illuminated with electric lights, while telegraph instruments attached to wires at every corner of the hall gave out the dots and dashes. The feature of the evening was a grand march lead by Mr. and Mrs. H. V. Crain under the direction of Miss May Michaels

Mr. George Bagot sang "In the City of Sighs and Tears" which was well rendered. The programme was a fine one and refreshments were served. The leading ladies present were Miss Kaut, Miss D. Barry, Miss May Michaels, Mrs. H. V. Crain and Miss Parmlee.

THE ASSOCIATED PRESS.

Since The Associated Press made the announcement last June that it would allow each operator in its employ an annual vacation there have been few if any resignations. The natural inference is that the position of operator was made additionally valuable to the employees which accounts for the few changes that have occurred in the force during the past six months.

WESTERN UNION.

Mr. John Brant of the operating force and secretary of the Old Timer Telegraphers' Association, while able to get around and visit his friends is still unable to resume duty at the office. Mr. Brant does not expect to return to his desk for some time to come. He states that he is now putting the finishing touches on the proceedings of the Old Timers meeting at Milwaukee, and the

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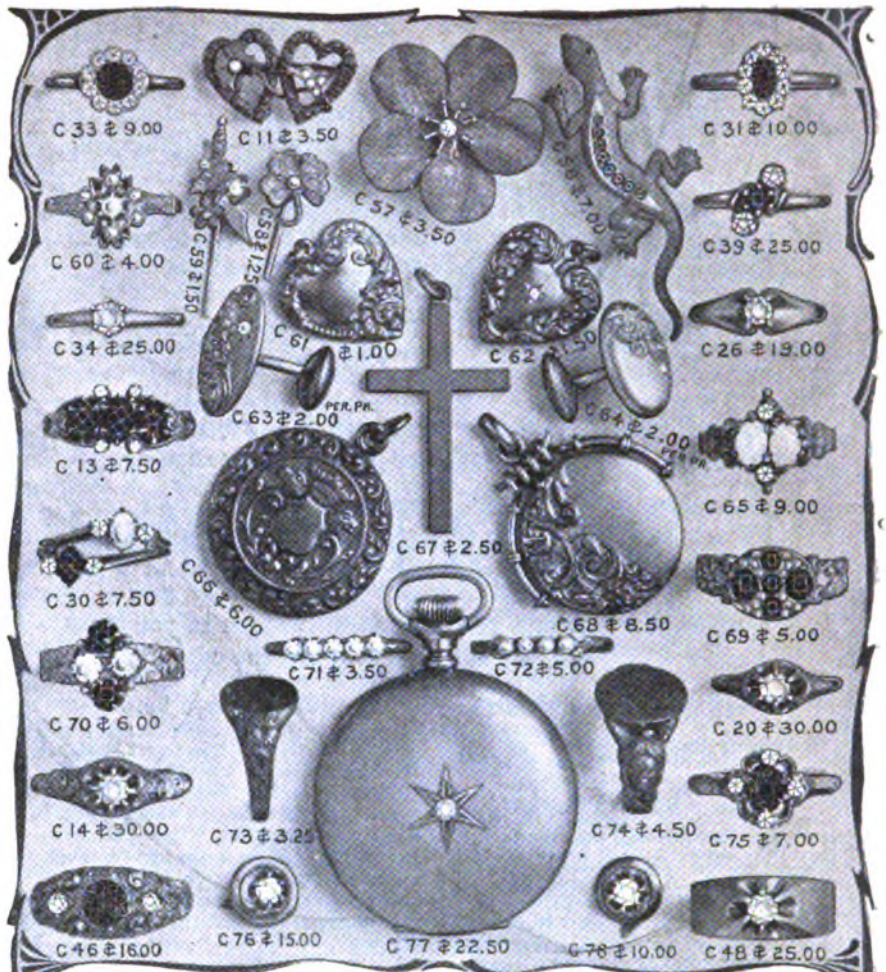
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are cured and I never hear from them.

But of 600,000 sick ones—seriously sick,
mind you—who asked for my guarantee, 39
out of 40 have paid.

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but one time in 40 in diseases deep-seated
and chronic, isn't it certain I can cure the
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send me his name. That's but a trifle—a
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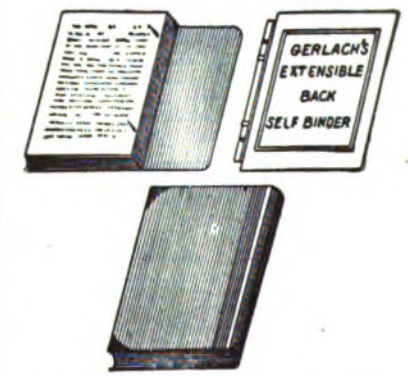
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book describing that interesting event will be distributed among the members during the Holiday season.

Mr. Marion H. Kerner will deliver a lecture on the "Historical Progress of the Telegraph" on Wednesday evening, December 16, under the auspices of the Board of Education Free Lecture Bureau, at the hall of the Y. M. H. A. 92d street and Lexington avenue. All telegraphers are invited to attend.

Mr. J. L. Edwards one of the old timers, and for many years in charge of one of the Phelps printers, is absent from the office owing to illness.

Mr. B. H. Reynolds who was reported in a previous issue as the successor to Mr. J. Simmonds, who was assistant to manager M. W. Hamblin, was chief clerk of the Stock Exchange and Central Cable office for a number of years and is well qualified to fill the position.

The usual falling off in business at this time of the year has set in. The dull season usually lasts until January 10, when it is expected that the telegraph business will then become lively and continue so until after the election in the fall.

The bonus system is not only being extended to cover circuits in this office but is also being introduced in all large telegraph centers where the system can be worked to advantage both to the employer and employee.

Mr. B. Brooks, general superintendent; W. M. Fashbaugh, electrician of the eastern division, and G. Brooks, of the general superintendent's office, recently made a business trip to Boston.

The annual entertainment for the benefit of the relief fund, of The New York Telegraphers' Aid Society will take place Thursday evening, January 7, 1904, at the Lexington Avenue Opera House and Terrace arden, 58 street and 3rd avenue. The entertainment will consist of high class vaudeville, followed by dancing.

The object of the relief fund is to provide immediate relief to worthy and distressed telegraphers, who by reason of disability or from any other cause, are debarred from membership in the society.

The relief fund is maintained solely by the net proceeds of these annual entertainments. This fund has been severely taxed the past year. In order that its good work may not be lessened, and if possible increased, the co-operation of every one is invited to make this entertainment surpass all previous efforts. **NEW YORK POSTAL.**

The typewriter used by Mr. Wm. M. Gibson, of this office, when he received the twenty-five messages and won the Carnegie medal and the all around championship of America, at the recent Philadelphia tournament, was a No. 2 Remington over twelve years of age, and which had not been cleaned in over two years. The judges commented favorably upon the neat appearance of Mr. Gibson's work. Mr. Gibson has not yet got over smiling about the matter. Many other contestants used brand new typewriters, but the result of the contest goes to prove that it was not altogether the typewriter, however good a

machine, as this one in fact proved to be, but the man in front of it to whom credit is due. In Mr. Gibson's case it was the coolness of the operator who never once lost his presence of mind and never for an instant permitted the sender to "rush" him.

William H. Murphy, died suddenly December 7, of heart trouble at his home, 653 East 152 street, this city, aged fifty-three years.

Mr. Murphy started as a messenger boy for the Western Union Telegraph Company in 1865. He soon became an operator working in various branch offices of that company, and thereafter was with the American Rapid Telegraph Company, and the Bankers and Merchants Telegraph Company. For the last fifteen years he has been employed by this company where he remained until a few days before his death. He was away on a leave of absence. He was a faithful and conscientious operator of a genial disposition and well liked by his associates. The burial took place from his late residence, on December 10. A handsome floral tribute was sent by his associates in this office.

Many operators will remember Al. Slowey who was employed by the Western Union Telegraph Company at Newark, N. J., about seventeen years ago. At the time of the advent of the Baltimore and Ohio Telegraph Company he came to the front and proved to be one of the fastest operators in that company's employ. He then went with the Bankers and Merchants Telegraph Company at 187 Broadway, which was afterwards absorbed by the Postal, and for a time he was assistant chief operator for the latter company. Later he became connected with The United Press and rose to the position of night chief operator in the New York office. About eighteen months ago his health broke down and he went to Denver, Colo. where he worked for a broker, and also the Postal Company. His health continued to fail and he returned to his home in Newark, N. J., where he died December 8. His death will be deeply regretted by all those that knew him.

E. C. Le Suer has returned after an illness of five months.

Resigned: Miss Rosina De Silva, C. A. Cuneo, J. F. Cronin and Mrs. H. Mitchell.

Misses Florence Enright and Beatrice Crawford have been assigned to city lines; Dr. J. B. Weighart to the extra list.

M. Jurist, night chief check has been appointed to the day force as operator; S. Blaisdell from the service department to night chief check.

Mr. C. J. O'Connor is the happy father of a daughter, born December 2.

Among the Postal representatives who attended Hope Lodge on the evening of December 9, to see John F. Skirrow, electrician of the eastern division take his third degree, were Theo. L. Cuyler, Jr., W. D. Francis, W. H. McCullum, J. E. Begg, S. F. Jones, E. S. Butterfield and F. E. d'Humy, of Boston.

Mr. H. A. Yoell, an expert telegrapher and a member of the newspaper force, has gone on a

visit to his mother in San Francisco, stopping en route at Chicago, Milwaukee, and in Colorado. His many friends in the East wish him a pleasant sojourn on the Pacific Coast.

Burglars Hold Up Railroad Telegraphers.

Burglarizing watch towers and slaughtering the lone telegraphers seem to have become a fad with tramping burglars. The Glenmore, Pa., railroad tower was besieged on November 29, by three men, but the answer to a call by the operator for help came so quickly that the robbers were frightened away by the approach of a special train bearing assistance, but not before they had secured the watch and one hundred dollars belonging to William De Haven, the telegraph operator. Now railroad companies furnish the operators of their block systems with assistants, and arm them to the teeth.

The fact that a telegraph operator alone in a high tower, or in a railroad station, in this country, and in the most thickly settled part of it, is in danger of being assassinated, is startling.

On November 30, there was another robbery on the Pennsylvania, in the Schuylkill valley, where the robbers blew open the safe at Phoenixville and obtained \$300.

Another attempt at robbery occurred at Thacker, W. Va., on the Norfolk and Western line, on the night of December 5, when Miss Kate Roughbrough, a young girl less than twenty years of age, was surprised by a desperado when engaged in taking a train order from the wires. Effecting her release from her assailants grasp she struck him with a hatchet, afterwards shooting him twice, from the effects of which he died. The young operator gave herself up to the authorities, but the magistrate refused to hold her, congratulating her upon her brave deed and releasing her upon her own recognizance.

At Morristown, N. J., on the same date, on the Delaware, Lackawanna and Western road, three daring robbers took possession of the ticket office during the noon hour, robbed the same of over two hundred dollars, and made good their escape.

A stranger, supposed to be a tramp, made persistent efforts on December 6 to force his way into the Pennsylvania Railroad tower at Farrandville, Pa., which is only a few miles from Brown's Tower, where W. F. Clendenen, the operator there was murdered, as recorded in our previous issue. The fellow only took his departure after McCloskey, the operator, had fired four shots from a revolver through the door. The man came first about 10 o'clock and demanded admission. McCloskey fired once through the door without effect, but an approaching train frightened the man away. Before going, however, he said that he would return when the train had passed. He came back, as he had said, and attempted to break down the door. Then McCloskey fired three bullets through the door. This was apparently enough for the visitor, who decamped. Whether any of the bullets hit him is not known.

Single handed and with no chance to summon aid, J. R. Largonot, the telegraph operator in the Pittsburg and Lake Erie Railroad telegraph tower at Alliquippa Park, Pa., a mile from any habitation, battled with three negroes at an early hour on the morning of December 8. He was beaten into insensibility and robbed of about \$50. His assailants left him bound in a chair.

Largonot had just received orders for the Cleveland express and was awaiting its arrival. A knock came at the door and when he opened it three negroes forced their way into the little office. Largonot drove his assailants back several times with a heavy club, but eventually he was knocked down and beaten until he became unconscious. When he revived the negroes had gone, the office had been thoroughly ransacked and \$50 of Largonot's money stolen.

At the Morton Grove station, Ill., on the Chicago, Milwaukee and St. Paul Railroad, two masked men on December 8, held up the night operator Rankin, binding his hands and feet and twisting a gag in his mouth until the cords cut into the flesh, and then threw the helpless man into an empty freight car and locked the doors with padlocks. The robbers secured less than \$50, after breaking into the cash drawer with a hatchet. Bound and gagged in the freight car, Operator Rankin knew that a number of fast trains were due, and feared that his failure to be at his post might mean loss of life and property should new orders come in over the wire. By a great effort he succeeded in working the gag from his mouth by moving his lips and jaws. His cries attracted the attention of the crew of a switch engine which had stopped near the station, held up by the signals. The freight car was broken into and Rankin released.

The Pennsylvania Railroad towerman at Rusling Station, on the Camden and Amboy Division, four miles from Trenton, N. J., was held up late Saturday night, December 12. Three men entered the tower and at the point of a revolver secured from James Kinsey, of Bordentown, the telegraph operator, the contents of his pockets, consisting of only small change. The robbers then made their escape, and Kinsey sent word to Trenton. While a squad of police were going toward the tower they saw three men who on the approach of the officers took flight. One of them, Robert Mitchell, who gave Trenton as his address, was captured and held on a charge of trespassing on the railroad.

Printing Telegraph Exhibition.

The Steltje Printing Telegraph system has been on exhibition in practical operation at the Hotel Imperial, New York city, for the past two weeks. Many interested in telegraphy were invited to inspect the system and in response to the invitations a number of gentlemen availed themselves of the opportunity to investigate the device. The exhibition was in charge of Mr. E. Liebman, general manager of The Typewriter Telegraph Corporation, Limited, of London, England.

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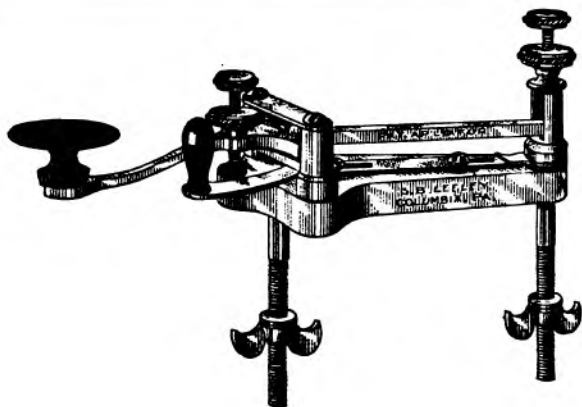
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The contact plate on end of lever which insures a firmer contact than if two small points were used.

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"The Telegraph in America," by the late James D. Reid. A complete history of the telegraph, including the organization of the various telegraph and cable companies; full Russia binding, 846 pages, illustrated. Regular price \$7, special holiday price \$3.50, good until January 15; express charges prepaid to any address in the world.

"Tales of the Sierras," by J. W. Hayes; 136 pages, embracing twenty-three capitably written and highly interesting telegraph stories, quaint and smacking of wild frontier life in the mountains. Regular price \$1, special holiday price 50 cents, good until January 15; express charges prepaid to any address in the world.

Those desiring a full set of the above named books, which would cost through the regular agencies \$14.50, will be supplied with the same on receipt of \$7, which includes the prepayment of express charges. This offer is good until January 15, 1904. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

A Valuable Book on the Telegraph.

The Twentieth Century Manual of Railway and Commercial Telegraphy by Fred L. Meyer, is especially adapted to those young men who are now holding mediocre positions as operators and are seeking advancement on merit. It gives an insight hardly to be found elsewhere and contains full instructions of the most practical kind regarding all kinds of common abbreviations, simple and compound punctuations, technical messages, train orders, telegraphic reports, service messages, grain, provision and livestock C. N. D'S, extra word, forwarded, other line and combination messages. The material has been so systematically arranged that one is guided along the various branches of railway and expert commercial business not known to the average operator, who has not had an opportunity

to work in a large city office or on more than one or two roads. It gives an operator the opportunity of pursuing at his own station branches of telegraphy not handled on his wires. It's methods are thorough, fully abreast of the times, helpful and practical.

The price is one dollar which covers prepayment of express charges. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York City.

The Value of a Technical Education.

If any more evidence were needed to prove that the value of technical education is now well recognized, the address delivered before the American Society of Mechanical Engineers, by President James M. Dodge, would probably be conclusive. However, the growing demand for technical men, and the crowded courses at the technical schools, are alone sufficient to prove the case. It is true that there has been a great deal of discussion and even criticism of our technical courses as now laid out, but these criticisms merely indicate that there is a growing demand for men with a broader training and a wider view than that given by our present somewhat narrow engineering courses. The rapid growth of the electrical industries created a great demand for men with a special training, and it was to meet this demand that these courses were laid out. Now the employers have tested technical graduates, and they appreciate their value; but there is a new demand for men whose training has been carried further than that which can be given a college student in four years. To meet this new demand, several technical institutions are now offering graduate courses in engineering subjects.

Mr. Dodge in his address takes up only the money value of technical training. He compares the earnings of young men of four classes—labor, shop-trained or apprentices, trade school and the technical school—from the time they are sixteen until they have reached the age of thirty-two. Comparison is made by capitalizing at five per cent. the young man's earnings for fifty weeks, the figure thus obtained being designated as his potential value. A chart thus constructed shows that the laborer starts with \$3 a week when he is sixteen, and rises to \$10.20 by the time he is twenty-one; but he rises no higher. His potential value at that wage is \$10,200. The apprentice or shop-trained worker starts with the same wages as the laborer at sixteen, but rises more rapidly, and is earning by the time he is twenty-four years old, \$15.80. His potential value at that time is \$15,800, but he makes no further rise. The trade school graduate, starting at the same point, rises still more rapidly, and is earning when he is twenty-five years of age \$22 per week. From this point his at that time being \$22,000. From this point his wages rise less rapidly, reaching possibly \$25 a week at the age of thirty-two, and representing a potential value of \$25,000.

The graduate of the technical school starts at the same point at a weekly salary of \$3, and is earning \$4 when he enters college at eighteen. Upon graduating from college, at the age of twenty-two, he

can draw a salary of \$13 per week. He has then already passed the laborer, but is still a little below the shop-trained apprentice. He passes the latter, however, during his first year of employment, but is still below his trade school graduate, whom he does not overtake until his twenty-fifth year. From this point on he rapidly leaves behind the other three workers and at the age of thirty-two is drawing \$43 a week, his potential value being \$43,000; and the curve indicates that his value is still rising, although at a slower rate. Thus, four years' training at a technical school makes a man, by the time he is thirty-two, four times as valuable as the shop-trained apprentice, and seventy-two per cent. more valuable than the trade school graduate. Surely a good return for four years in preparation.

Mr. Dodge's method of analysis should carry conviction to certain classes of employers. On the other hand, it does not take into consideration other phases of this problem which doubtless influences many ambitious young men. It is certainly some satisfaction to such a man to occupy a more important position than his brother workers, and to feel that he is an important factor in the development of his profession, and in the advancement of the world.—*Electrical Review.*

Death of James Hookey, Until Recently The Head of the English Telegraph.

James Hookey, who succeeded Sir Wm. H. Preece as chief engineer of the English telegraph system, and who himself was retired on account of ill health in March, 1892, died on November 20, from the effect of a stroke of paralysis.

Born at Bristol, England, in 1839, Mr. Hookey was educated at Bath, and entered the service of the Electric Telegraph Company in 1855. Six years later he was appointed engineering inspector and assistant superintendent of the company's West Midland section, and in 1862 he was transferred to London to work as chief officer under the late Cromwell F. Varley and his successor, Richard S. Culley. Then came the transference of the telegraphs to State control, and, although Mr. Hookey was offered the position of superintendent of the telegraph system of a great railway, he decided to enter his country's service as principal technical officer under the late Mr. Graves and Sir William (then Mr.) Preece. On the death of Mr. Graves in 1892, the two positions of engineer-in-chief and electrician were filled by Sir William Preece, and Mr. Hookey became chief assistant. He continued in this position until 1899, when he was appointed to the post of chief engineer, rendered vacant by the retirement of Sir William Preece.

Mr. Hookey not only had an extensive knowledge of engineering matters, but his business and administrative capacities were very remarkable, and his untiring energy, both as chief assistant engineer and as engineer-in-chief, have materially assisted in raising the department to its present state of high efficiency.

Mr. Hookey had many friends in the United States, and when he last visited this country, about five years ago, he was warmly received and hospitably entertained.

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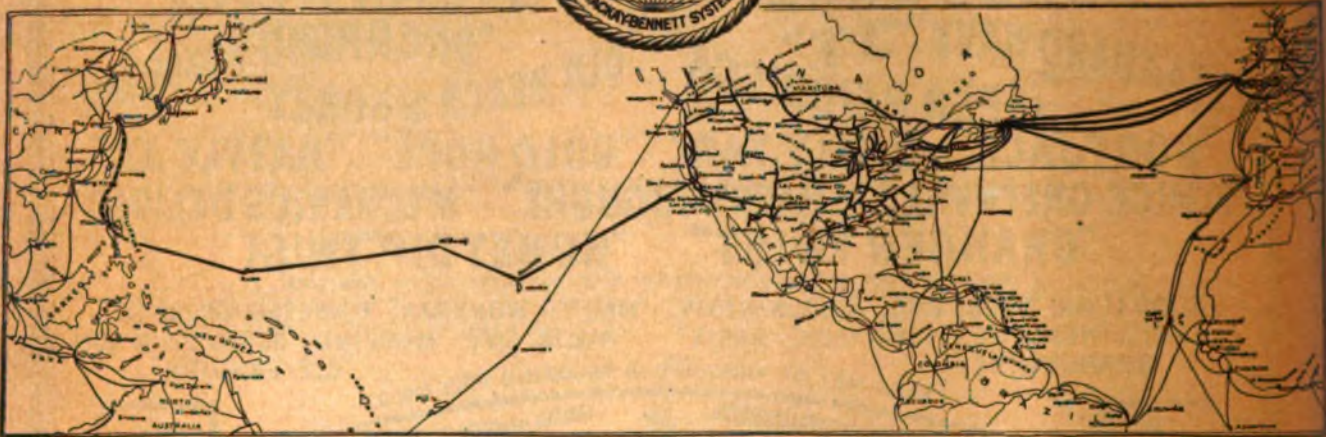
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