

TELEGRAPH AGE

A Semi-Monthly Journal Devoted to Land Line Telegraphs, Submarine Cable Interests and Radio-Telegraphy

Office of Publication: 253 BROADWAY, NEW YORK

ESTABLISHED
1883

Single Copies 10 Cents } For Yearly Subscription Rates
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No. 23.

NEW YORK, DECEMBER 1, 1908.

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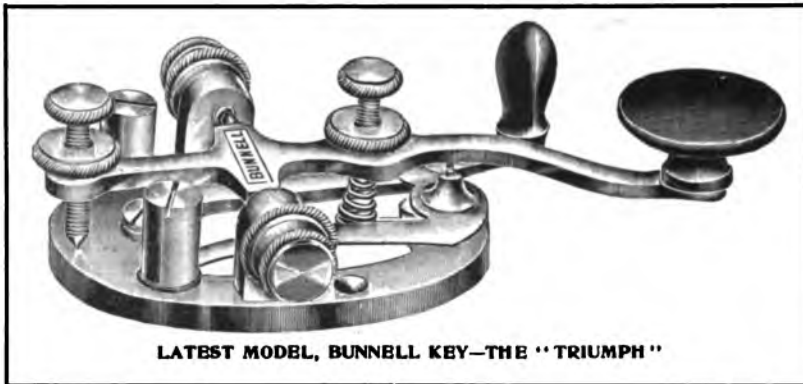
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- Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.
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- Old Time Telegraphers' and Historical Association, will meet at Pittsburg, Pa., at a date to be named later.
- Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.
- Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.
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Twenty-fifth Year.

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

Elementary Lessons Concerning the Operation of Repeaters.

(PART III.)

As the reader will have already learned from the description of various repeaters in the preceding installments of this article, the successful operation of each type depends upon a holding magnet, or, in some cases, a circuit shifter, in order to become automatic in action.

In addition to the dissimilar methods employed by Wood, Milliken and Horton in their repeaters, already described, there are yet several other ingenious arrangements which accomplish the same purpose, one of which is the well-known Weiny-Phillips repeater. Figure 1 shows just enough of the apparatus to illustrate the principle involved in the operation of the holding device without giving the actual wire connections. Both transmitters are purposely omitted and the two line wires are shown connected through the relay contact points instead of through the tongue of a transmitter, as is really the method in actual practice. This is merely to simplify the diagram.

It will be seen that in this repeater the extra magnet is placed just above the relay magnet and

on the same side of the lever as the latter. Also, that one lever suffices for both magnets. The little magnet is energized by a local battery and the relay magnet, of course, by the main line current. As a current of electricity normally flows through both magnets when both relays are closed,

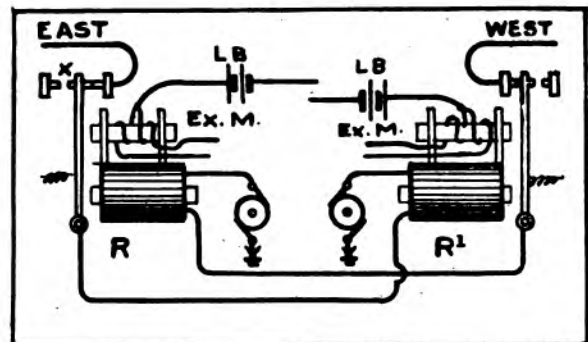


FIGURE 1.

it is necessary that the two iron cores of the respective magnets shall not both be magnetized at the same instant and thereby tend to actuate the common lever simultaneously instead of alternately, as may be required.

The manner in which the inventor gets around this difficulty is as follows: The little magnet is wound differentially, after the manner of a multiplex relay. When both relays are closed the

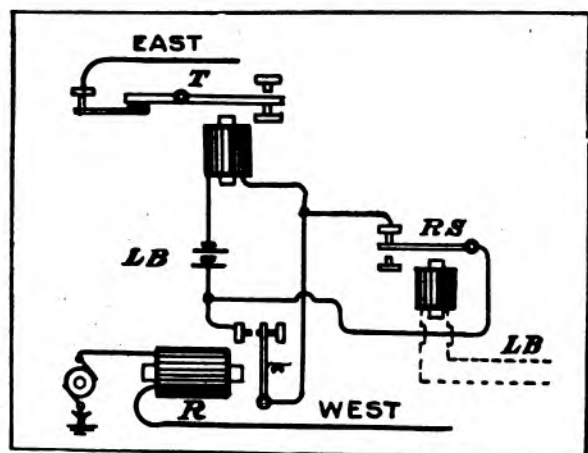


FIGURE 2.

local connections are such that the current divides equally between the two coils of the little magnet, but as the two volumes flow in opposite directions, there is, of course, no magnetic effect on the core of the little magnet.

If, however, one of the main line circuits should open, the consequent opening of the contact points

of the relay and the transmitter it controls, immediately opens one coil of the little magnet. The result is that the companion coil in the latter **now unopposed** by its mate instantly magnetizes the iron core and holds the lever closed until the core of the relay just below it again becomes energized and resumes duty.

If the reader will glance at the diagram he will readily see that in the event of relay R becoming demagnetized through the opening of the western circuit the eastern wire will not be opened at contact point X, and thereby open relay R'; also because the little magnet holds the lever fast during the critical moment.

In most repeaters the extra magnets cannot act until the levers which close their local circuits first cross the space between the front and back contact points. A break therefore is not quite instantaneous. In the Weiny repeater the holding magnet becomes effective the instant the lever starts to fall back and for this reason it is probably the quickest acting device employed in the capacity of a holding magnet.

In the Atkinson repeater, probably the most popular type used by the Western Union Telegraph Company, the method employed to keep the transmitter points through which the companion main line wire runs closed at the critical moment, is to utilize the tongue or lever of a repeating sounder to complete and substitute an extra path or shunt around the contact points of the relay when it opens, and thus prevent the local battery circuit containing the transmitter magnet from opening. The same apparatus and connections, of course, constitute the companion half of the repeater. (For complete diagrams of this and other repeaters described see Jones' Pocket Edition of Diagrams.)

Figure 2 shows the arrangement of the local battery circuit containing one transmitter, together with the tap connections therewith through the lever of the repeating sounder. The repeating sounder is controlled by one end of a companion transmitter in the other half of the repeater outfit, not shown in the diagram.

It is quite evident that if the contact points of the repeating sounder are set close together, or, in other words, the lever be given a minimum play, the action of the repeater should be very rapid; while the operation of adjusting such a repeater is the same as if when adjusting an ordinary Morse relay.

We have probably given a sufficient number of illustrations to afford the student a general idea of the operation of single line repeaters, yet there are a number of other arrangements which are equally as ingenious and efficient. In every case, however, if one wishes to learn the action of any particular pattern or make of repeater quickly, let him first direct his attention to the "holding magnet" and ascertain how it is controlled.

In the next installment of this article we shall show how repeaters that connect single-wire cir-

cuits with multiplex circuits are constructed and operated; also, how two multiplex circuits are repeated.

(To be continued.)

Recent Telegraph Patents.

A patent, No. 902,792, for a type-printing telegraph apparatus, has been granted to Gustav A. M. Agrell, of Stockholm, Sweden. A telegraph apparatus of the type having a movable type wheel provided with means for moving it to printing position and then to a certain starting position after the typing action.

A patent, No. 903,195, for a testing galvanometer, has been awarded to Harry T. Johnson, of New York, and Charles E. Avery, of Jersey City, N. J. A flat magnet core is disposed in a horizontal central position relatively to the needle and has a greater width at its center than at its ends.

The following patents have expired:

A patent, No. 462,901, for duplex and quadruplex telegraphy, held by F. W. Jones, New York.

Patent No. 463,428, for a telegraph sounder, held by J. Maret, of Mount Vernon, Ky.

Personal.

Mr. W. P. Cline, of Wilmington, N. C., superintendent of telegraph of the Atlantic Coast Line, accompanied by his wife, spent several days in New York last week.

Mr. Theodore N. Vail, president of the American Telephone and Telegraph Company, New York, sailed for Europe a few days ago to spend a vacation abroad and probably will be absent for two months.

The Study of Telegraph Engineering.

Mr. W. N. Fashbaugh, electrician of the eastern division of the Western Union Telegraph Company, New York, makes this contribution to the series of letters, the publication of which was begun in the issue of November 1, written by men who have attained promotion to high position in the service, and who are competent to give the advice which they do:

For the young operator wishing to fit himself for advancement in the electrical department of the telegraph I would suggest a thorough study of the fundamental laws of electricity and magnetism, the reading of publications explaining the various applications of electricity for commercial purposes, an electrical course in a correspondence school and if residing in New York or vicinity, the attendance at the free lectures on electrical subjects which are given in the public schools.

This should give him a theoretical knowledge of great assistance in an understanding of the practical working details, construction, principles of operation and maintenance of telegraphic systems and apparatus which he is called upon to handle from day to day.

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Radio-Telegraphy.

The covering by wireless telegraphy by press messages of the wide ocean span between San Francisco and Hawaii, an interval of 2,100 miles, marks a gratifying advance in the successful working of that system over long distances. This has been made possible in this instance by the new and powerful wireless station recently erected at San Francisco. By its means communication was also established at numerous remote points on the Pacific Coast and even with vessels, it is said, in the Behring Sea.

The signal service wireless stations in Alaska have made another record, removing all doubt as to the feasibility of sending wireless messages overland. Fort Gibbon, several hundred miles inland, is receiving messages from Nome and St. Michael, five hundred miles distant, with many ranges of hills between the two stations. A message sent by the steamer Northwestern 1,100 miles west of Cape Flattery to the United Wireless station at Cordova was copied. The message traveled about 1,200 miles in an air line over two ranges of mountains, capped with snow.

The Navy Department will shortly issue invitations for bids for the construction of a powerful long-distance wireless telegraph station. A mast is to be constructed in or near Washington three hundred and fifty to four hundred feet high, and it is expected to be able to get into touch with vessels three thousand miles distant. In the same advertisement bids will also be asked for two wireless ship equipments that will have a radius of one thousand miles. The new station will also be used for thoroughly testing the long-distance systems. If successful, the new high-power station may eventually supersede many of the stations now along the Atlantic Coast.

Mr. John Hesketh, chief electrician to the Commonwealth Government, Australia, in giving evidence before the Postal Commission in Melbourne, on September 30, stated that in his opinion wireless telegraphy was not justifiable for commercial use in that commonwealth; tenders for wireless stations had been invited, in order to ascertain their cost, and the Defence Department and the Postmaster-General's department recommended installations at Fremantle, Sydney, Cape York, Thursday Island, Port Moresby, Melbourne and Cape Borda. The traffic between Victoria and Tasmania was sufficient to keep two cables working on the duplex system, and was beyond the capacity of wireless telegraphy.

A cablegram from Paris, under date of November 23, states that Bellini and Tosi, two Italian scientists, who have been experimenting in wireless telegraphy for eighteen months on the Normandy coast, announce that they have solved the problem of independent wireless communication. This result, they say, has been secured by means of two rectangular aerials fixed at right angles and so attached to the apparatus for receiving and

transmitting as to permit the transmission of unequal currents. By a simple law of mechanics those two electromagnetic forces unite and produce an electro-magnetic field and the Hertzian waves are projected in a single vertical plane which can be alternated instantly by means of the Bobine device. The inventors have picked up messages at will from every English wireless station and from ships at sea and have transmitted messages from Pourville to Havre and other points without the waves being perceptible at stations just off the line of transmission. Among the advantages that their discovery will add to wireless telegraphy they mention the determining by triangulation of the exact position of a ship in distress, the position and speed of a hostile squadron and the reading of secret exchanges between friendly fleets and armies.

The Cable.

The new German Cable Company formed to lay cables between Germany and Brazil via Teneriffe, will announce its adhesion to the International Telegraph Convention during the summer of 1909.

Cable communication is interrupted November 28 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Macao	Aug. 29, 1908
Hayti	Nov. 23, 1908

Messages can be mailed from Hongkong.
Private messages for the interior not accepted.

Foreign Telegraph Statistics.

The report of the postmaster-general of Southern Rhodesia, Africa, on the telegraphs in that colony for 1907, shows that of telegraph lines there were 3,647 kilometers of line and 6,696 of wire, while in the Bechuanaland Protectorate there were 947 kilometers of line and 2,983 of wire. The government constructed a line of 39 kilometers in length on iron poles between In-siza station and Myati, and was also erecting a line between Blinkwater and Felixburg, 38 kilometers in length.

The telegraph system in the Transvaal in 1906-7, increased by 282 kilometers of line and 49 kilometers of wire; 4,011 and 15,729 kilometers of line and wire were aerial, while 8 and 224 kilometers were subterranean. There were 254 offices open to the public—an increase of 12 over the previous year. Of the offices, 128 belonged to the railway service.

The telegraphic system of the Island of Ceylon grew in 1907 by 81 kilometers of line and 292 kilometers of wire to a total of 2,743 kilometers of line and 5,878 kilometers of wire.

Don't borrow your neighbor's paper; subscribe yourself for TELEGRAPH AGE. You can't afford to be without it.

The Barclay Printing Telegraph System.

BY WILLIAM FINN.

(Part XII.)

THE RECEIVING APPARATUS—CONTINUED. PRINCIPLE OF OPERATION.

Before entering into a more detailed description of the receiving apparatus and its *modus operandi*, it may be well to give the reader some general idea as to how it is possible by means of the signaling impulses to so control the operation of the printing magnets, that any combination of the fifty-eight different characters in use may be automatically impressed upon the regular blanks provided for the reception of messages.

It has already been stated that for each letter or character to be printed, six current impulses, alternately positive and negative, and varying in length, are employed. These positive and negative impulses, whether of "dot" or "dash" duration, are intended primarily to operate a polar relay, the armature of which, as it oscillates to and fro, controls an escape-wheel, to which a step by step movement is imparted.

In the course of its rotation, this wheel is made to successively close a gap in each of the local circuits of as many electro-magnets as there are line impulses, and in the specific order in which these impulses arrive over the line. Five of these electro-magnets—known as "distributing relays"—are utilized for the purpose of selecting, or setting up, certain "combinations," the character of which is such, that the circuit of every printer magnet, except the one to be energized, will stand "open" by the time the fifth pulse has reached its destination. At that identical moment, the circuit of the one printer magnet whose operation is desired will be "closed," so that when the sixth, or what might be termed the "printing pulse," arrives and completes its work, a character representing the particular combination of pulses contained in the signaling series will be duly impressed upon the message blank.

In order to effect these combinations, it is necessary that in every series of the six transmitted impulses, one or more of said pulses should have a period equal to that of "dash" duration. The short pulses (those of "dot" duration) do not affect any of the distributing relays, which, it may be remarked, are really brought into action through the medium of an interposed neutral, or "separator" relay, adapted to respond only to the long line impulses, and through whose contact points the local current for energizing either of the distributing relays is permitted to flow at the proper moment.

A better understanding of the principles involved may perhaps be obtained by reference to Fig. 37, where the printer relay (whose armature movements correspond with those of the main

line relay) is represented as controlling two branch circuits containing the separator relay, the escapement magnet, and a synchronizing magnet, each of which is provided with two separate and independent coils.

The separator relay is of the neutral or non-polarized variety, and its armature spring is adjusted so as to make the relay indifferent to the short current impulses, but responsive to those of longer duration, whether in a positive or negative direction.

The escapement magnet, being of the polarized type, is actuated by currents of either polarity, long or short, that are utilized to release an escape-wheel and unison wheel (which normally tend to rotate under the influence of an electric motor) and by imparting thereto a step by step movement successively close the contact points of the pivoted levers numbered from 1 to 6 in the accompanying diagram.

This combination of escape-wheel and magnet, unison wheel with contact levers, and synchronizing magnet, is generally known as the "sunflower;" a term, however, more properly applied to that portion only of the apparatus comprising the rotating mechanism with its group of circuit-closing levers.

The synchronizing magnet is also of the polar type, but differs from the regular class of polarized apparatus in that only the iron cores of this instrument acquire polarity from the inducing magnet, an arrangement commonly known as the "Hughes" form of electro-magnet.

The winding of this electro-magnet is such that a current traversing either of its coils in the proper direction, will increase the amount of magnetism already in the core, whereas a current in the opposite direction will diminish, or tend to neutralize its magnetic value. In the case of the synchronizing magnet, the induced magnetism is assisted by the kind of polarity developed from the regular spacing (positive) currents, and opposed by that developed as a result of the marking (negative) currents. As the synchronizing armature spring is normally adjusted to withstand the tendency to vibrate under the influence of the shorter pulsations, and inasmuch as the long marking pulses are not of the right polarity to magnetize the soft iron core, it will be evident that only the long spacing impulses are adapted to bring the synchronizer into service.

Now, a long spacing pulse invariably occurs at the end of each letter, and this is utilized to energize the synchronizing magnet, the particular function of which is to so act upon the unison, or correcting wheel, that in the event of the latter being out of step with the incoming pulses, it may be quickly restored to the unison or zero position, from which point a fresh start can be made with any new series of line impulses. The method of accomplishing this will be understood by reference to the figure where, as will be seen, the

escape-wheel is provided with forty-five teeth, and the unison, or correcting wheel with fifteen teeth; a ratio of three to one. As these two wheels are on the same driving shaft, and normally tend to rotate by the power derived from the electric motor, a step by step motion will be

one tooth (or rather the space between two of its teeth) in the case of the unison wheel. On the end of the synchronizing lever is a hook that is normally adjusted to rest in the spaces between the teeth of the unison wheel; hence the latter, in the course of rotation, would bring

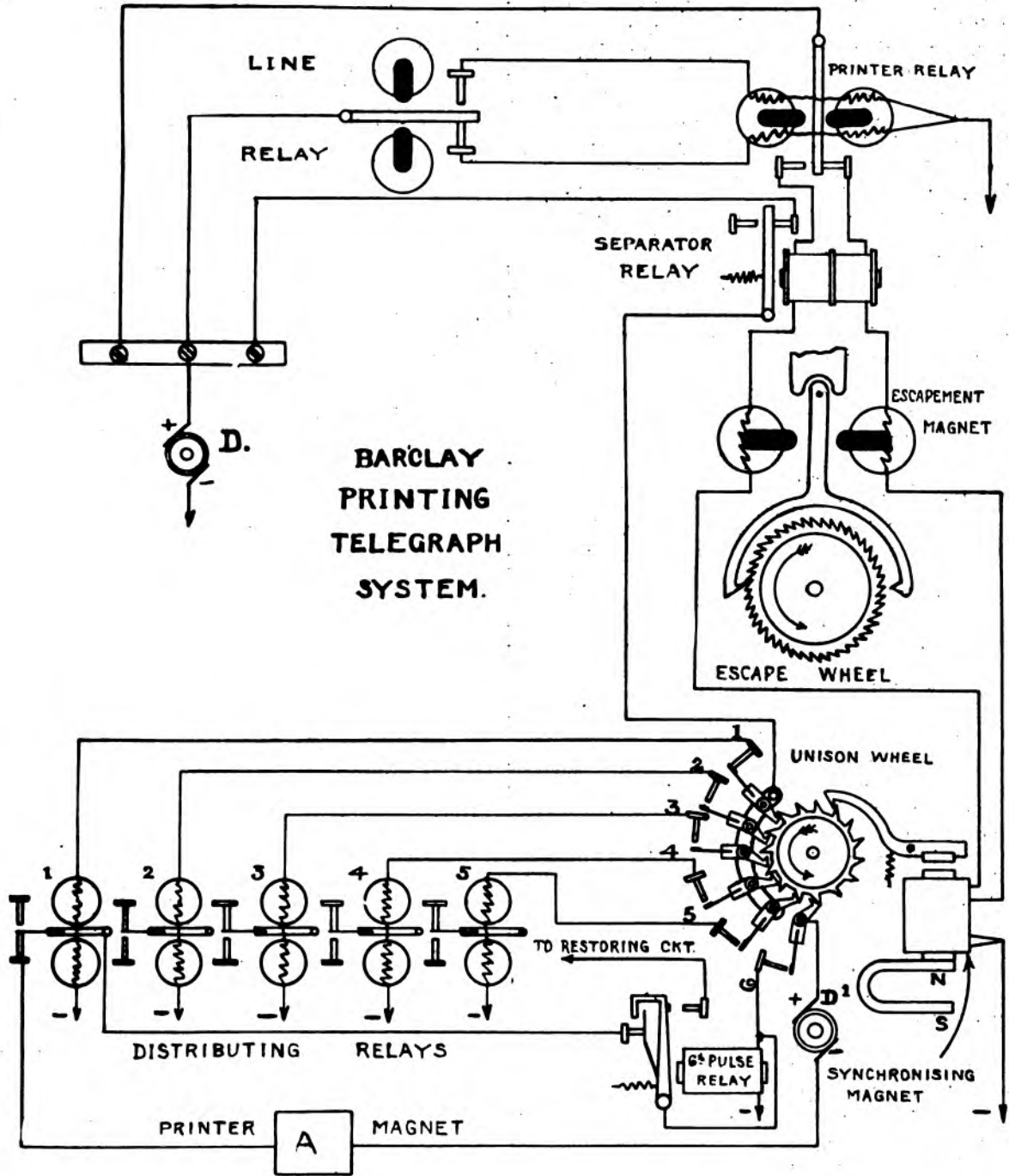


FIG. 37.—DIAGRAM ILLUSTRATING PRINCIPLE OF PRINTER SYSTEM.

communicated to both wheels by the action of the escapement magnet, and thus turn them through the same distance for any series of six line impulses, this distance being represented by three teeth in the case of the escape-wheel, and

some tooth or other into contact with the hook and thereby arrest the motion of the wheel, but for the fact that at the moment this would otherwise occur, the synchronizing armature is attracted by the long spacing pulse and the hook

thereby removed from the path of the tooth. So long, therefore, as the line impulses remain intact, this action on the part of the hook in getting out of the way of the teeth at the end of each series of pulsations, will permit both wheels to continue their rotary step by step motions in correspondence with the alternations of the incoming impulses. This unison, however, is destroyed by the loss of one or more of the current impulses, as, under such circumstances, the synchronizing magnet would not come into action at the proper moment; but a correction is automatically applied at the very first character combination that follows in which there is no long spacing pulse.

It will be observed that the teeth of the unison wheel, as the latter revolves, successively butt against the toes of the six pivoted levers (1, 2, 3, 4, 5, 6), through the flexible points of which electrical connection is established with the five distributing relays and the sixth pulse relay. The circuit of these relays, however, can only be fully completed when the armature lever of the separator relay is on its front contact—that is, whenever a long pulse of either polarity has developed enough magnetism in the core to attract the armature into the position shown.

We will now suppose that the letter "A" is to be printed. The combination of characters arbitrarily fixed for this letter consists of a dash and two dots (—.) in the formation of each of which, two currents of opposite polarity (negative at the beginning and positive at the end of each pulse) are required, or a series of six pulses in all. Since the first of these pulses is a prolonged one, the armature of the separator relay will be attracted at the very moment when, by the action of the escapement magnet, a tooth engages the toe of the pivoted lever No. 1, thereby closing the circuit of No. 1 distributing relay and permitting current from dynamo D to flow through that instrument via the contact points of the separator relay and those of the aforesaid lever. As a result thereof, the armature of No. 1 distributing relay will be attracted to one side, and remain in that position until the end of the cycle of pulses. As all the rest in the series of pulses we are now considering are short ones (with the exception of the last one, which as previously stated is always a long spacing pulse) the separator relay—now in its normal position—will not be actuated, but the escapement magnet will continue its work of turning the escape and unison wheels, and of consecutively closing the remainder of the sunflower points without, however, completing the circuits of their correspondingly numbered distributing relays. Hence, the only distributing relay affected by the combination of line impulses in this particular series is No. 1 relay, which, in this instance, has set up a simple circuit combination through its points that leads directly to the printer magnet representing the letter "A," the circuit of which is fully completed when, upon the arrival of the

sixth pulse, the corresponding, or sixth pulse relay is brought into action.

To select the printer magnet representing the letter "K," the character combination of which consists of three dashes (— — —), the first, third and fifth distributing relays would have to be energized in the manner already indicated, and a more complex circuit arrangement would then be set up and completed through the group of "multiple" contact points with which these relays are provided.

After the selection and printing of a letter, it is necessary that the relay, or series of relays which may have been engaged in that particular work, should be restored to a neutral position, so as to be in a condition of readiness for the next cycle of operations. With this end in view, each distributing relay is provided with an extra winding forming part of a "restoring circuit," through which a current flows from dynamo D' as soon as the armature of the sixth pulse relay reaches its front stop at the termination of each series of signaling impulses. This restoring circuit is, for the sake of clearness, omitted from the accompanying sketch, which, for the same reason, does not show the actual disposition and arrangement of the sunflower mechanism, that being reserved for a subsequent article.

(To be continued.)

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Charles C. Adams, second vice-president, spent a few days recently in Philadelphia, his old home, where formerly as manager and subsequently as superintendent of the company he was a resident.

F. G. Waterhouse, vice-president and general manager of the Southern Nevada Consolidated Telephones and Telegraph Company, with headquarters at Tonopah, Nev., was a recent visitor at these offices on business connected with the service.

Another executive office visitor was H. A. Tuttle, vice-president and general manager of the North American Telegraph Company, Minneapolis, Minn. Mr. Tuttle, who usually takes his vacation in the winter, will visit California before returning to his home.

Other visitors were:

Superintendents A. L. Edgecombe, of Boston; H. D. Reynolds, of Buffalo; L. Lemon, of Philadelphia, and Charles E. Bagley, of Pittsburg; C. A. Richardson, manager, accompanied by his wife, and P. J. Farrell, chief operator, of Boston; W. M. Pruyn, manager, and C. C. King, chief operator, of Albany, and T. C. Sydnor, of Richmond, Va.

Mr. F. E. d'Humy, assistant electrical engineer, has been to Chicago and Buffalo on company business.

RESIGNATIONS AND APPOINTMENTS.

Mr. Vail V. Stevenson, chief operator of the Los Angeles, Cal., office, has been promoted to

the managership, and Mr. J. H. Dorsey, formerly assistant chief operator, has been made chief operator.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

General Thomas J. Eckert, chairman of the board, who has been spending the past summer and fall seasons at his country home at West End, N. J., has returned to the city for the winter and is occupying his fine new residence at 38 West Eighty-sixth street. The many friends of the General will be glad to learn that, although over eighty-seven years of age, he comes back to town reinvigorated, alert and active, by his long vacation.

Recent office visitors from Chicago were Theodore P. Cook, general superintendent; W. J. Lloyd, assistant superintendent, who was accompanied by his wife, and Amos Young, general foreman of construction.

Other visitors were Jacob Levin, general superintendent at Atlanta, Ga., and Isaac McMichael, vice-president and general manager of the Great North Western Telegraph Company, Toronto, Ont.

Frank Jaynes, general superintendent, and I. N. Miller, Jr., assistant general superintendent of the Pacific division, with headquarters at San Francisco, Calif., have completed a tour of inspection in Oregon and Washington. As a result of their trip increased telegraph facilities will be made to the company's equipment in the Northwest. The Alaska-Yukon-Pacific exposition of next year will require additional wire facilities to take care of rapidly increasing business.

Mr. G. F. Swortfiger, assistant general superintendent of construction, together with superintendent of telegraph, W. C. Walstrum, of the Norfolk and Western Railroad, and L. J. Maxwell, superintendent of this company at Richmond, Va., have finished a general tour of inspection of telegraph property over the Norfolk and Western Railroad system.

Mr. A. R. Lingafelt, assistant superintendent at Chicago, has been transferred to Oklahoma City, Okla., where he will act in the same capacity, his jurisdiction extending over portions of three districts.

Mr. George M. Myers, one of the best-known business men of Kansas City, Mo., and a former telegrapher, at one time extensively engaged in telegraph line construction in the far west, and president and general manager of the old Pacific Mutual Telegraph Company, was a recent visitor in New York.

Commendatory of Telegraph Age Teachings.

George J. Frankel, superintendent of the Western Union Telegraph Company at St. Louis, is an appreciative reader of Telegraph Age, in whose columns he appears to find much to commend. In a recent letter, accompanied by an order for a large number of copies of the issue of November 16, he writes:

Your editorial on "Neatness, Order and Discipline in Telegraph Offices," is one that appeals to me, covering as it does, conditions with which we all have to cope, and I wish to distribute the article in question as widely as possible among the managers in my district. Your paper contains so many pertinent articles that it is difficult to say which is the most helpful, but this particular one seems to me to meet a long-felt want.

Municipal Electricians.

Mr. Vernon H. Wetherell has been appointed superintendent of the fire-alarm telegraph system of Danielson, Conn.

The Common Battery Duplex.

BY CHARLES E. HAY.

(In the Post Office Electrical Engineers' Journal, London.)

Before entering into a description of the common battery duplex recently adopted by the British Post Office, it will be as well to review the system formerly in use in order to fully comprehend the difficulty presented by the problem of working duplex from a battery or batteries placed at one end only of a telegraph line, and to indicate the progress which has been made in this branch of common battery working since its introduction some few years ago.

In the original system, a positive and a negative battery were required at the central station for the purpose of sending to line reversals of current which operated the receiving apparatus at the out station, but were not of sufficient magnitude to operate the non-polarized relay at the central station, the armature of the relay being biased against the currents by means of a helical spring. An increase of current effected by means of the key at the out station shunting the high resistance sounder with a resistance of 1,500 ohms, created a magnetic force in the relay at the central station sufficient to overcome the force exerted by the spring, and therefore operated it. The current in the out station receiving apparatus was not sensibly affected when the shunt was applied, and in consequence the signals were satisfactory in both positions of the key at that station. At the central station, however, when its relay armature was in a "marking" position, a reversal of the current allowed the tongue of the relay to "kick" off the marking stop, causing the current in the local circuit to cease for a short interval of time, and consequently breaking the signals on the local sounder. Obviously this defect was extremely serious, and presented a problem not easy of solution. The manner in which the defect was covered up—it has never been remedied—affords a remarkably interesting example of the value of a knowledge of the laws governing transient currents of electricity. The local sounder is joined up in series with a resistance of 300 ohms, both being shunted with a condenser of eight microfarads capacity. The condenser is charged when the tongue of the relay comes in contact with the marking

stop, and remains charged as long as they are in contact, but when the tongue "kicks" the condenser is allowed to discharge, and sends a current through the resistance of 300 ohms and the sounder, thereby maintaining the continuity of the signal. The current in the local sounder varies with time from the instant the tongue leaves the marking stop. It will be noted that the current flows through the sounder for 45×10^{-3} seconds after the tongue leaves the marking stop, and is of considerable strength for half that period of time. If, therefore, the time which elapses between the tongue leaving the stop and returning to it does not exceed about 30×10^{-3} seconds the continuity of the signal is not broken, and satisfactory working results. In practice, when the key at the central station is closely adjusted so as to make the time as short as possible in changing from a voltage of one sign to that of another and when the rate of sending is normal, no difficulty is experienced. Owing, however, to the objection of manipulating a closely adjusted key and the impossibility of obtaining a constant rate of sending, this system of common battery duplex was found imperfect, and it was recognized that some other principle of working must be discovered.

The following system devised by the present writer is free from the defect just described, and it has now almost entirely displaced the older system. It differs in every respect from the system it has superseded. One battery only is required, and it is joined up permanently when the circuit is in use. Tumbler switches are provided for cutting off the power when the circuits are shut down.

Normally, owing to the bridge arms being equal, and the resistance of the line together with the resistance of the apparatus at the out station being greater than the 1250 ohms resistance at the central station, a current flows through the receiving apparatus at the latter; and the wiring is so arranged that this current is in a "spacing" direction. When the key at the out station is depressed 1000 ohms is cut out of circuit—one coil of the polarized sounder and the 500 ohm resistance coil—consequently the resistance of the line plus the remaining resistance of the apparatus is now less than the 1250 ohms resistance at the central station, hence the direction of the current through the receiving apparatus at that station is reversed, and, as will be shown presently, its magnitude remains approximately unchanged. The depression of the key at the out station causes the potentials at the terminals of the polarized sounder to change, but it is arranged that their difference remains constant. The receiving apparatus at the central station is therefore operated by reversing the direction of the current in it, while the receiving apparatus at the out station is unaffected. That there is no change in the difference of potential across the polarized sounder at the out station in

all positions of the key there, is only absolutely true when the key at the central station is depressed. There is a slight change in the difference when the key at the central station is not depressed, but it is of no material consequence, as the out station apparatus is not then recording a signal.

The depression of the key at the central station joins the battery direct to the split of the polarized relay; the current in the line is therefore increased, and it is this increase which operates the receiving apparatus at the out station. The direction of the resultant magnetic induction in the relay, due to the current splitting differentially through its coils, is not affected, as its components, which are proportional to the currents in the coils, depend entirely on the relation between the resistances on each side of the bridge arms, and, as already shown, this relation is controlled by the operator at the out station. In order to render it unnecessary to bias the polarized sounder at the out station against the permanent current which flows through its windings, it is joined up in such a manner that the magnetic induction in its cores due to the polarizing magnetic force is in opposition to the induction due to the almost equal magnetic force created by the permanent current.

Having described the working of the system, perhaps it would now be of interest to indicate the reason for the selection of the different resistances which are used.

The line is banked up to a resistance of 350 ohms so that all lines within a radius of sixteen miles of the central station may be accommodated (22 ohms per mile being taken as the maximum resistance of wires running into large centers from places which would be worked from a common battery). If the resistance per mile is less than this amount greater distances can, of course, be covered, as the system can stand considerable line leakage and capacity.

The influx of new men in the telegraph service has created an increasing demand for that standard work on the telegraph, "Pocket Edition of Diagrams and Complete Information for Telegraph Students," by W. H. Jones, conductor of the department in this journal bearing the title "Some Points on Electricity." Doubtless, this book is required to "brighten up" telegraphic knowledge, especially of those who are returning to the key after absence therefrom. As the volume was written by a telegrapher, yet in the harness, practically familiar with all the "ins and outs" of an operator's work, it conveys just the kind of information most desired. In fact, a careful reading of the book, which contains 334 pages, and a thorough study of its 160 diagrams, will teach the average operator more about telegraphy in its application to his daily work than he can possibly derive from any other source. The price of this book is \$1.50, which includes the cost of carrying charges to any point in the United States. Orders should be sent direct to this office, or to any of our agents who may be found with both the Western Union and Postal telegraph companies in nearly every large center in the United States.

TELEGRAPH AGE will furnish operators with just the kind of practical information they require.

Mr. Stevenson Postal Manager at Los Angeles.

Vail V. Stevenson, the new manager of the Postal Telegraph-Cable Company at Los Angeles, Calif., furnishes another representative of the type of the progressive young man in the telegraph service. Mr. Stevenson was born near Kansas City, Mo., March 30, 1881. He entered the service as a Western Union messenger boy in 1895. By 1899 he had become an operator for the same company at Los Angeles. Subsequently he entered the employ of the Southern Pacific railroad, later returning to the Western Union as an operator at Phoenix, Ariz., from which he went to Tucson as repeater chief. In these several changes he had shown aptitude as an operator, was careful, diligent, observant and at all times a student. In 1905 Mr. Stevenson was appointed assistant chief operator of the Postal, and in the year following received promotion to the managership of the repeater station at Ashfork, Ariz. From this point he was transferred



VAIL V. STEVENSON.
Manager Postal Telegraph-Cable Company,
Los Angeles, Cal.

to Los Angeles as chief operator. His elevation on November 1 to the head of the office advances a young man who has earned his way by the exercise of those qualities that mark the conscientious aspirant.

An American Switchboard for the Paris Telephone Exchange.

The Telephone Exchange of Paris was destroyed by fire on September 20, a disaster that resulted in the loss of property valued at \$6,000,000, and completely paralyzing the telephone service of the French capital. An order for a new switchboard, 180 feet in length, to take the place of the one burned, was placed with the Western Electric Company on September 29, the proviso of the contract being that the new board, together with all other apparatus necessary to its equipment, should be delivered in Paris within

sixty days, heavy penalties to be exacted in case of failure. The completed switchboard, together with all fixtures, was shipped by rail from the company's Hawthorne works in Chicago. A train of six cars and two days' time was required to convey the material to New York. Transshipment was then made to a French line steamer which sailed on October 29. Thus it will be seen that in less than a month from the date of its receipt, the order had been executed and the manufactured product was on its way across the ocean to its point of destination. Two weeks later the new switchboard was in position. The transaction afforded an instructive object lesson of American resources in general, and of the capacity of the supplying company in particular. Incidentally it may be remarked that the back of this switchboard contained about a million soldered connections and three thousand miles of wire. Approximately 40,000 feet of lumber was used in packing the switchboard, and 10,000 square feet of paraffined paper was used in waterproofing the cabling boxes.

Giant Telegraph Poles.

An instance of setting massive telegraph poles was witnessed on October 15, when M. B. Wyrick, superintendent of construction and equipment of the Postal Telegraph-Cable Company of Texas, successfully placed two poles of unusual dimensions. The trees from which these giant poles were the outcome were cut near Marysville. At Beaumont, to which point they were shipped, they were treated with creosote, twenty-four pounds to the cubic foot. The poles after treatment weighed between eight thousand and ten thousand pounds apiece. One pole measured one hundred feet in length, twenty-two inches at the butt, and ten inches at the top; the other was one hundred and two feet long, with a twenty-four-inch butt and eleven-inch top. These poles are intended for a river crossing and carry five Postal wires, one wire of the Texas Oil Company and fourteen of the Southwestern Telephone Company.

Carnegie's Business Maxims.

To secure promotion, a young man must do something unusual, and especially must this be beyond the strict boundary of his duties.

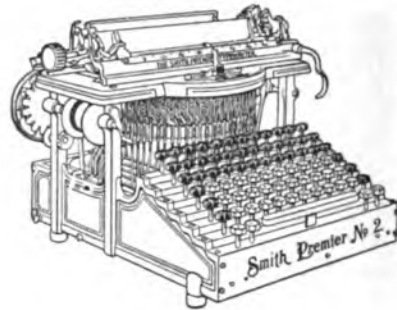
Aim high. I would not give a fig for a young man who does not already see himself partner or head of an important firm.

Begin early to save. No matter how little it may be possible to save, save that little.

Look out for the boy who has to plunge into work direct from the common school, and who begins by sweeping out the office or store.

Business is a large word and covers the whole range of man's efforts. The same principles of thrift, energy, concentration and brains win success in any branch of business.

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POSTAL OFFICIAL DIAGRAM.

The diagrams appearing in "Official Diagrams of the Postal Telegraph-Cable Company's Apparatus and Rules Governing the Construction and Repair of Lines" were made from the company's blueprints and are absolutely correct. This volume, which is published by TELEGRAPH AGE, under official sanction and supervision, is of especial value to operators and linemen. It will be sent to anyone, post-paid, on receipt of fifty cents. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

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Telegraph Age.

Entered as second-class matter at the New York, N. Y., Post Office.

Published on the 1st and 16th of every month.

TERMS OF SUBSCRIPTION.

One Copy, One Year, in the United States, Mexico,
Cuba, Porto Rico and the Philippine Islands . \$2.00
Canada 2.50
Other Foreign Countries 3.00

ADDRESS ALL COMMUNICATIONS TO

J. B. TALTAVALL, - Editor and Publisher,
263 BROADWAY, NEW YORK.
E. H. BOWEN, Associate Editor.

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CABLE ADDRESS: "Telegraph," New York.

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DECEMBER 1, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

Relay Points and Chief Operators.

The position of chief operator in a telegraph office is one attendant with much responsibility. The successful discharge of the duties pertaining thereto call properly for the possession of qualities of mind and the exercise of executive abilities, distinguishing traits in the man of capacity. Hence it is that one holding that office should owe his promotion thereto because of acceptable training and of proved capability.

Relay offices, in telegraph systems, are crucial points, so to speak, for at such places it is that delay or expedition in the transmission of messages is largely controlled. The alert chief operator with a clear conception of the needs of the service, will keep business moving. He will not permit messages to accumulate in his office, but will see to it that their distribution to points of destination will follow promptly their receipt.

If this were not done the manager of the smaller office would frequently be placed in a false position for which he would in no way be responsible, although blame would inevitably and naturally fall on his shoulders. For the minor office man solicits business with the guarantee of its prompt transmission. If this fails because of dereliction at the point of relay he is likely to be called to account by an irate customer. So the importance of early attention to the relaying of messages becomes at once apparent.

Now, there are chief operators and chief operators. In contradistinction to those who conscientiously expedite all relay matter coming to their offices, there are those who carelessly allow messages to accumulate on the hooks for periods anywhere from five to thirty minutes' duration, frequently longer. This is a great mistake and should not be tolerated under normal conditions. It is an act of injustice alike to the sender of the message, the office in which the message originated, and the company which is responsible for its transmission, for which, as a rule, no valid excuse can be given. It should be possible under ordinary circumstances to send a telegram a distance of from 1,000 to 4,000 miles anywhere in this country, and receive an answer to the same within one or two hours' time. If, however, the message be delayed variously from five to thirty minutes at each repeating point, as the case may be, the sending customer may consider himself fortunate indeed if he receives a reply to his telegram the same day. To delay messages as is sometimes done, at repeating stations, simply because the chief is of a temperament to procrastinate, an act which of itself is to encourage like negligent habits in others, is all wrong, and tends to bring opprobrium upon the telegraph company, really undeserved, but for which it is held accountable.

Henniker Heaton and His Two-cent Cable Rate.

Mr. Henniker Heaton, M.P., is at it again, and has succeeded in attracting considerable personal attention to himself as an exponent of cheap telegraphy as exemplified in a lowering of cable tolls. His fad now is a two-cent cable rate to all parts of the British Empire, as well as Government ownership of the cables. His recommendations, however, have a broader scope for their ultimate attainment, for he would include the world in their application. Like prototypes who periodically appear on this side of the Atlantic to criticise and take a whack at the telegraphs, the problems of which involved in management and technicalities in working, perplexing in themselves to trained executives and men of profound scientific attainment, they know absolutely nothing, so Mr. Heaton assumes to speak with authority regarding great systems of ocean telegraphy regarding which his utterances betray lamentable ignorance. His assertions, thrown out with the vague lightness of "I tell you so," are

marked by superficiality of thought, of erroneous statement and meaningless platitudes, unsupported by evidence, by facts or by figures. In the vernacular of the day, "He makes us tired!" A mind so omniscient as his must seemingly soon develop into omnipotence.

While here in the United States the question of Government ownership does not appeal to the popular judgment, it is different abroad, for State ownership of the land line telegraphs has gained ascendancy almost the world over. Despite this fact, it does not anywhere yet appear that the British Postmaster General and the telegraph authorities generally in Great Britain are favorably lending a listening ear to Mr. Heaton's startling proposition. The magnitude of the transaction and the enormous cost involved in acquiring the various lines of British cables, may well cause the Government to stand aghast at the very suggestion.

Mr. Heaton fails to realize that if the Government assumed control of the cables the purchasing cost of the lines, gigantic as that would be, would pale into insignificance when compared with the annual deficit that would result from Government management and the absurdly low rate of two cents a word.

Emphasis may be placed upon the conservative estimate that during the current year over \$3,000,000 has been expended on repairs and the maintenance of cable repair steamers. Another fact of importance to be kept well in view is that off the west coast of Ireland over \$500,000 is the sum paid for repairing broken cables during the past summer alone. Do such heavy figures of actual cash expenditures warrant the marking down of rates? Such as these and all other burdens of maintenance, under Government control, would fall upon the taxpayer who seldom or never uses the cable, as is also the case with the land line systems, for it is not the public at large who support the telegraph, but the demands of the press and of business men. It is true that important social and death messages find occasional transmission, but comparatively speaking these are but few in number. Over ninety per cent. of the telegrams sent and received in almost every telegraph office in the world relate to business transactions.

Neither Henniker Heaton, nor, indeed, any statesman or advocate has yet been able by conclusive argument to prove the justice of imposing upon the people at large a burdensome tax to meet telegraphic deficit. It makes no difference how low telegraph tolls may be, experience demonstrates that the public generally will not use the telegraph unless the occasion demands speedy action. It is no doubt true that a lowering of cable rates would increase to a certain, yet probably limited, extent the volume of business, but the expense of working would not be decreased, and with enlarged traffic would come additional expense. It was tried once. A reduction was made in the Atlantic

rate. The results showed an increase in traffic of about ten per cent. and a falling off in receipts of over forty per cent., not an attractive conclusion surely. It is hardly necessary to say that the rates went up again.

Neither the land line telegraphs or the submarine cables will ever, in our judgment, rob the post office, as we understand its uses, of its legitimate functions.

Mr. Heaton is not happy in his allusions to the working of fast sending instruments by which as he alleges practically unnumbered words may be transmitted over the cables within short periods of time. Here again is the evidence of the catch-penny argument advanced in behalf of lower rates, of which we are not without illustration at home. Messages cannot be transmitted in unlimited volume in unlimited time, for reasons that every well-informed telegraph engineer knows, and if they could, business does not exist that would supply such voluminous sending.

Mr. Heaton alludes to the laying of the Government-owned cable connecting Canada and Australia, as a shining example of such ownership. The enormous annual deficit occasioned by this line, a cause of hearty grumbling to the several colonies that it is supposed to aid, when the hand of the taxpayer in each has to go deep down in the pocket to meet losses incessant in their appeal, cannot be regarded as a flattering exhibit of business acumen to the average man of capital. If a reduction of tolls were now to follow on this unfortunate line, well might hands be thrown up in despair.

Our Canadian neighbors cannot exactly be congratulated over the fact that their Postmaster General, Sir Rudolf Lemieux, who was present when Mr. Heaton read his paper, speaking in reply practically endorsed the visionary scheme to which he had been a listener. The Canadians as a people, like ourselves, are on record as being antagonistic to this idea of abnormally low telegraph rates. They would make their lines of telegraph paying undertakings rather than to be bolstered up by calls upon the Government exchequer.

An Appreciative and Aspirant Telegrapher.

The following letter speaks eloquently for itself. It is commended for its manly earnestness, its evident sincerity, and appears to be an expression coming direct from the heart. It rings true, its note is at concert pitch, and we hope that the communication may receive a wide reading. The writer has revealed his character, unconsciously, perhaps, and we counsel him to continue as he has evidently begun—to study, to be observant, to work hard, to be patient, to be steadfast to his birthright, to the honor and to the manhood that is within him:

I have been prompted to write to Telegraph Age because of what I read in its November 1 issue. Pardon me if I speak too freely of myself. I do not wish to appear unseemly, but there is something in the tone of your paper that encourages me to recip-

rocate the friendly feeling that marks its attitude toward the operating fraternity. I have heard your friendliness disputed, but I take no stock in such adverse criticism. I feel that it is not warranted.

I am a young operator trying to do my best. Sometimes, I am free to confess, I grow rather despondent when I consider my condition, look upon my environment, and think of the uncertainties of the future. Such moods are foolish, I know. Maybe it is because we are human that they come to one. Then I reason with myself not to be a fool, and pluck up courage, fling myself into my work, and resolve to succeed. But the question is, Shall I? I have many responsibilities to meet, for there has been a shadow in my life; I think of my school days when I was strong with resolve. Thank God, I obtained a fairly good education. I am glad I was studious when opportunity afforded. I hoped for college but that was denied me. The choice of the telegraph business was accidental, but I like it, and shall try to "work out my salvation" in its service, thankful for the helpfulness of Telegraph Age, which I read religiously. Somehow its counsel seems to stir the best there is in me.

But I started in to speak of the excellent letters printed in the last number, written by well-known members in the telegraph service, who urge the necessity of work, work, work and study on the part of operators anxious for promotion. You may smile when I tell you that I have looked up the personal history of these writers in Telegraphers of To-Day, and from other authorities, and that I have found abundant record of who and what they are—in the beginning operators like myself, perhaps working under discouragement. Of course this was not necessary, for the advice they give will stand by itself, but all the same I was interested in doing so, and then the reading was instructive. I notice so much of indifference about me that I sometimes wonder if I, too, shall fall into such habits of common thought and careless methods that shall make me apathetic as to my future. Perhaps such forebodings are due to moments of weariness. But let me tell you, the perusal of the letters has aroused afresh earnest reflection. I for one have been stimulated by them. I notice that each writer followed the same general line of thought, the argument in each case being substantially alike. That is an evidence of the fundamental truth conveyed. What is said shows beyond all controversy that the road to future success is open only to those who will devote time and energies to doing things to the best of their ability, and to keep on doing so. No doubt we must earn what we receive, as you so frequently remind us; there seems to be no getting around that. I thank the authors for their letters and Telegraph Age for publishing them.

The Proceedings of Reunion of the Military Telegraphers.

The proceedings of the twenty-seventh annual reunion of the Society of the United States Military Telegraph Corps, held at Niagara Falls, N. Y., September 16, 17, 18, 1908, has made its appearance. It a handsome brochure of thirty pages, well printed on exceptionally fine paper, and is a fitting supplement to the meeting itself, the doings of which it affords a verbatim report. The output is a credit to its compiler, David Homer Bates, the secretary of the society.

Topics of the Telegraph.

A peculiar form of recreation among the small boys of Connecticut is that of "firing" stones. Whether this kind of sport originated primarily because of the stony nature of the soil of the Nutmeg State, thus in a measure directing this

form of childish amusement, is not known, although this custom has prevailed since the early days. Possibly it is a heritage of puritanical times, an era which frequently developed a hard and flinty way of doing things. Be that as it may, it must be admitted that the practice is a most reprehensible one, regarded by sensible people from whatever point of view; especially, it may be remarked with emphasis, when stone throwing is directed against telegraph insulators as the objective point, and particularly so when dexterity of aim and high momentive force have abundantly developed by practice. Naturally the telegraph people have objected, seriously so, and with rising choler, to thus having the fragile portion of their pole line property made a target of, and it is not to be wondered at that they have viewed with dismay, if not with alarm, the wanton and destructive bombardment as it has proceeded. The determination is to mete out punishment to the aforesaid small boy. The difficulty has been to locate him, for his actions have been guerilla-like and elusive. The hand is ready to smite, but the urchin of the environment wears the smile of innocence. Accordingly the telegraph company has caused printed notices of the offence described to be distributed, in which a reward is offered for the apprehension of the culprits. Verily the tribulations of the telegraph are many!

Who of us does not remember the "piece" of school-day declamation, told in humorous verse, in which a French traveler objected to the payment of a bill for his night's lodging when presented by the landlord in the morning, protesting that it was exorbitant and complaining of the presence of rats and mice which raced up and down across his room all night, and which kept sleep wholly from his eyelids. The landlord in reply "confounds" the rats, and expressing a desire that he might get rid of the rodents, the witty guest suggests a remedy which he claims would be effective, namely, to present the vermin with the bill. Now, it appears, that a Postal messenger boy of Freeport, Ill., has invented an "electric" mouse trap, a new type, something evidently owing its existence to ideas gathered by its inventor from the telegraph, designed to meet and overcome just such experiences as caused the Frenchman's discomfort. Doubtless landlords are plagued by the presence of rats and mice as of yore, and if this modern trap for which extraordinary virtues are claimed, especially fitting it for use in "hotels and other large establishments," as the announcement reads, the guarantee being that it is a "sure thing," the traveler of the future ought to be able to obtain repose in peace and comfort in an overnight lodgment at any caravansary, go on his way rejoicing, first having paid his reckoning without demur. On the theory that a rule is a poor one that won't work both ways, this trap evidently is to meet a "long felt want."

It is said, "Of the making of books there is no

end." So it appears to be in the bringing of suits against the telegraph companies—there is no end. A fresh experience is involved in the following: A day laborer was at work on a sky scraper structure, in Illinois, at a point distant from his home. In reply to a letter received from his wife, making inquiries regarding his health (he had previously been ill) he telegraphed: "Got your letter. Feel O. K. now." It is claimed that the message on its delivery to the solicitous wife, read: "Got your letter. Fell O. K. now." The wife, we are told, immediately jumped to the conclusion, but whether unadvised or not in the quick mental process, is not stated, that her husband had had a fall. This prompt judgment, so decisive in its findings, left the woman no alternative but to immediately go into a state of decline, because of the mental anguish, as it is called, she had suffered, permanent injury to her health following, thus impairing her powers of money earning. Not only this, but the doctors who were called in to alleviate her distress, have further contributed to her woe by charging \$200 for their services. Now, it appears the only balm that will ameliorate her condition, soothe her wounded mind and body, is the sum of \$15,000, which she demands from the telegraph company and for which she has brought suit. May not the surmise be correct that modern Dodson and Fogg are taking cases for damages on "spec?"

A case of misplaced confidence has occurred at Oswego, New York. It seems that the bees in that lake city are of an especially industrious variety, and their manufacture of honey reaches unusual proportions. Casting about for a suitable place for storage for an excess of this delicious product, a cap box, located on a forty-foot telegraph pole, appeared to offer superior advantages for the purpose, seemingly secure, on account of its height above the street level, from discovery and consequent intrusion and theft, human propensities that exist where honey is concerned, even in Oswego as at other points. Alas, however, for the trusting confidence of these insects! It could hardly be expected of mere bees to know that the stowing away of honey in the receptacle chosen, no matter how innocent the intent, was in violation, if not exactly of the rules of the telegraph company owning the pole, yet at least of the unwritten law, which would hardly permit the placing of honey or other sweets or food stuff in its cap boxes, because of the liability of such presence to interfere with the proper working of the wires. Indeed, it is to this fact that the bees owed their undoing. A fireman of the company, an excellent employe, yet altogether matter-of-fact, a nature without estheticism, who made the discovery a year ago of a similar storage of honey in the same box, suspecting that wire troubles this season originated from the same cause, and examination proving his surmise to be true, ruthlessly despoiled the patient toilers of the result of their hard-earned summer work. A buzz of protest is heard in Oswego.

Of Interest to Ambitious Students of the Telegraph.

It frequently happens that a subscriber to Telegraph Age would like to secure specific information respecting some particular problem in telegraph engineering; or enlightenment perhaps on a given subject, which, however, would be satisfactory to the recipient if the matter were treated more generically. In order to afford all such seekers in the telegraph field for technical knowledge of a character to be of practical aid to them in pursuing the study of their avocation, this journal will welcome all proper inquiries, to which published reply will be made.

"Some Points on Electricity" has long been a familiar standing title on the first reading page of Telegraph Age; it has indicated a department of this paper that in its wide range of subjects discussed, covering every phase of the telegraph and of its practice, has for years exerted an influence highly educational in character. Written testimony as to the value of the information it has supplied to many a struggling and ambitious student of the telegraph, this journal has in abundance. The wish now is to widen this sphere of usefulness so that the advantages offered may be enjoyed by a greater number; to bring the department and for what it stands in closer touch with those who are seeking to achieve success in their chosen occupation. Telegraph Age wants to help all such, to extend a befriending hand in encouragement of studious and thoughtful natures, to the end that the personnel, and resultantly the service itself, may be benefited. For the telegraph has need, and urgently so, of men with technical understanding.

If operators—telegraphers generally, will avail themselves of this proposition of Telegraph Age, so freely tendered, and thus secure the benefits offered, it is believed that the department of "Some Points on Electricity" will develop even a greater degree of interest and helpfulness than has characterized it in the past, because of the added human element that will be injected into it, always a cause of intensifying and giving force to any purpose or principle.

All inquiries will be replied to either in the form of question and answer, or the matter regarding which information is solicited, if its importance warrants, will be made the subject of a general article.

Communications should be addressed to the Electrical Department, Telegraph Age.

Traveling Man—"My good man, what time does this train leave Swamp Centre?"

Agent—"My friend, I'm only the agent. I'm not a fortune teller."

Orders, if sent to Telegraph Age, Book Department, for any book required on telegraphy, wireless telegraphy, telephony, electrical subjects, or for any cable code books, will be filled on the day of receipt.

Annual Meeting of the Telegraphers' Mutual Benefit Association.

The forty-second annual meeting of the Telegraphers' Mutual Benefit Association was held in the Western Union Building, 195 Broadway, New York, on November 18, Belvidere Brooks, president, in the chair.

Frank E. Coyle, of New York, was elected secretary of the meeting. After the committee on proxies had reported Mr. Brooks directed that the secretary read the president's report. This was as follows:

The annual reports of the secretary and the treasurer, about to be presented to you, will show in detail the general condition and continued prosperity of your association. The business depression and the unrest which prevailed during the early part of the past year are reflected in the secretary's report by the large number of lapses which for the first time equaled the number of new entrants. The lapses and deaths being in excess of the entrants resulted in a slight loss of membership.

It is gratifying to state, however, that the assets of the association, which show a substantial increase year by year, now amount to \$307,059.56, exceeding six per cent. of the total contingent liabilities, and from examination of reports of various state insurance departments I find that this amount is larger in proportion to liabilities than is held by many similar organizations, and, in my opinion, insures the perpetuity of the Telegraphers' Mutual Benefit Association.

In January last the association was examined by the New York State Insurance Department and the net amount of the assets in excess of all liabilities was shown on the examiner's report as filed with the superintendent at Albany, N. Y., to be \$247,994.67, notwithstanding that the securities were valued at the very low market prices then prevailing, the report not including the amounts due from members for assessments, while every death claim reported was included in the liabilities, together with the amount of \$5,521.73 set aside under the law as a reserve fund. The examination also included an appraisal by the department of the value of every piece of property on which a mortgage is held; the total market value amounting to \$188,450, against which the association held mortgages aggregating \$78,050.

The report of the examination should be highly satisfactory, as it shows that even under the extraordinary conditions prevailing at the time it was made, and the severe test to which the fund was subjected, the reserve fund has been carefully and conservatively invested and the association found to be in sound financial condition.

We were also called upon during the year to furnish a large volume of statistics for use of the Department of Commerce at Washington, D. C., which included a list of every claim paid since the association was founded.

As a striking instance of the interest in the beneficent work by many of our old friends and members, I am pleased to state that under date of October 9, last, we were advised by the executors of the estate of Emma A. Tillotson, deceased, widow of the late Luther G. Tillotson, formerly superintendent of telegraph of the Erie Railroad, and later head of the large electrical supply house of L. G. Tillotson and Company, Dey street, New York City, a gentleman widely known and esteemed in telegraph circles, that the association was a legatee under her will for the amount of five thousand dollars. This amount, for which the association is grateful, will, in due course, be added to the reserve fund.

That the merits and advantages of membership in a society like ours, when earnestly presented, are attractive to those who love home and family, may best be evidenced by the fact that under conditions as at

present existing our Omaha agent recently forwarded twenty-eight applications for membership. Several other agents have also effectively though not so largely contributed, and I sincerely trust that the remaining agents, as well as every member, will be stimulated by these examples to do their full duty and invite every known eligible person to membership in this association, whose sole purpose is the protection of the families of telegraph and telephone employes by the best and safest and most economical plan of life insurance. I congratulate the members on the excellent condition of the association, and I thank the officers and executive committee, the agents and all who have aided me in the work of 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 4,598 in the full grade, and 709 in the half grade.

The sum of \$20,000 was carried to the reserve fund, which now amounts to \$295,246.43, to which will be added, when received, \$5,000 lately bequeathed to the association by Mrs. Emma A. Tillotson. The assets of the association were shown to be of an amount equivalent to a reserve of six per cent. on the total amount of insurance carried by the association.

The amount received for interest during the past year on investments of the reserve fund and current deposits amount to \$14,888.88. The income derived from interest is nearly treble the amount of the annual expenses, and is equivalent to nearly three assessments on the entire membership.

The following were elected officers for the ensuing year: President, Belvidere Brooks, of New York; first vice-president, Charles P. Bruch, New York; second vice-president, S. S. Garwood, Philadelphia; secretary, M. J. O'Leary, New York; treasurer, A. R. Brewer, New York. The members of the executive committee consist of President Brooks, W. C. Humstone, A. R. Brewer, James Merrilow, Charles P. Bruch, T. A. McCammon, G. H. Fearons, E. J. Nally and M. J. O'Leary, all of New York; W. J. Lloyd, of Chicago; auditing committee, H. D. Reynolds, chairman, Buffalo; W. J. Dealy, and Thomas E. Fleming, New York.

Charles P. Bruch spoke in eulogy of the late William H. Young, of Washington, who held the office of vice-president continuously for twenty years. Remarks of a similar nature were also made by W. L. Ives. Resolutions paying tribute to the sterling worth of Mr. Young as a man and as an officer of the association were ordered spread on the minutes of the meeting and a copy transmitted to his family.

Among those in attendance at the meeting were: Colonel R. C. Clowry, E. J. Nally, E. M. Mulford, E. B. Pillsbury, C. P. Bruch, W. J. Dealy, Belvidere Brooks, J. B. Van Every, M. M. Davis, M. W. Hamblin, C. E. Rafford, L. Dresdner, Frank O'Ryan, J. W. English, I. F. Nathan, H. T. Marks, W. L. Ives, C. H. Murphy, R. G. Page, W. H. Jackson, H. W. Drake, H. C. Lock-

wood, W. J. Austin, C. M. Holmes, H. V. Shelley, G. W. Logan, R. J. Murphy, F. J. Scherrer, A. M. Guest, J. B. Taltavall, T. E. Fleming, J. Costelloe, M. J. O'Leary, Frank E. Coyle, all of New York; C. E. Bagley, Pittsburg; S. S. Garwood, Philadelphia; H. D. Reynolds, Buffalo; P. J. Farrell, Boston; S. B. Curtis, Hartford, Conn.; N. R. Young, Washington; W. J. Lloyd and Frank Richardson, Chicago; Ashby Watkins and C. T. Sydnor, Richmond, Va.; W. P. Cline, Wilmington, N. C.; E. J. Kerwin, Albany, N. Y.; W. W. Prescott, Milford, Del.; F. C. Hackett, Toledo, O.; A. M. Smith, Paterson, N. J.; C. F. H. Johnson, Jersey City, N. J.

Dinner of the Magnetic Club.

There have been many noted dinners held by the Magnetic Club in the twenty years of its existence, of which the event of Wednesday evening, November 18, at the Hotel St. Denis, celebrated that anniversary, but of them all the peculiarly delightful social atmosphere that characterized the last meeting has never been excelled. Somehow it seemed a kind of homecoming, and all who met on the occasion appeared to do so because they belonged to the family and accepted their places that were theirs of right. But it was a big family that got together, for one hundred and twenty-five of its members were present. And it was a notable gathering, too, that one observed seated about the tables. Familiar faces were there, representative men of the telegraph, commercial and railroad, the latter in the person of the railway telegraph superintendents. Then commercial telegraph executives of both companies were there, meeting fraternally with those still at the key, for the Magnetic is democratic in spirit, placing all on a social level. The literati of the telegraph, writers and authors on the subject, were on hand, sufficiently so to impart a certain scholarly air to the environment. Out of town delegates to the annual meeting of the Telegraphers' Mutual Benefit Association were also present in considerable numbers as guests of the club; and these, together with a sprinkling of telephone men and representatives of allied manufacturing interests, altogether made up as congenial and pleasant a company as has assembled at a Magnetic Club dinner in late years.

Dinner was announced at half-past six o'clock. When at length the well-ordered menu had been exhausted, coffee served, and cigars lighted, men settled back in their chairs with that comfortable and hard to be defined satisfied feeling that follows a good dinner partaken of under particularly agreeable conditions, waiting expectantly for a further continuation of the programme, referred to as the "flow of soul." Marsden R. Cockey, first vice-president, who presided in place of President George H. Usher, now a resident of Atlanta, Ga., and unavoidably absent, rapped for order, and requested Charles P. Bruch to serve as chairman during the remainder of the evening.

He said that as Mr. Bruch was the first president of the club twenty years before, it was eminently fitting that on this anniversary occasion he should again occupy the chair. Mr. Bruch was warmly welcomed as he accepted the courtesy tendered. In a speech largely reminiscent in character, he said in part:

I thank you for the compliment that you have paid me in asking me to preside to-night. It gives me very great pleasure to again preside over a meeting of this club after a lapse of nearly eighteen years.

Our meeting here to-night is for two purposes—one is to celebrate the twentieth anniversary of the Magnetic Club, the other to extend hospitality to the officers and delegates of the Telegraphers' Mutual Benefit Association, and to honor that organization as a whole.

It may not be inappropriate on this occasion to recall the circumstances under which the Magnetic Club was born. In the winter of 1887-1888 the executive committee of the Telegraphers' Aid Society decided to have a reunion of members and a dinner in connection with the annual meeting of that society, and a committee, of which I was a member, was appointed to make the necessary arrangements. The date selected, as I remember it, was about March 15, 1888, but the big blizzard of March 12 of that year made it impossible either for the members of the Aid Society to attend the dinner or for the restaurant to supply it, and the dinner was, therefore, called off.

At a subsequent meeting of the committee of arrangements, however, somebody suggested that the committee at least might have a dinner by themselves, and that each member of the committee should invite one or two friends. A room was engaged for the evening of April 4, 1888, at the Knickerbocker Cottage, at Sixth avenue and Twenty-eighth street. The result was a party of about thirty. I do not recall the names of all who were present, but I remember that among the number were T. C. Martin, Minor M. Davis, Gardner Irving, Wm. H. Baker, J. B. Taltavall, J. M. Moffatt, E. T. Barberie, Alonzo Beatty, R. G. Stephenson, Tom O'Reilly, Charles L. Chase, J. H. Montgomery, D. W. McAncey, D. B. Mitchell, W. L. Ives, T. A. Brooks, John Brant, E. F. Howell, Hugh A. Moody, Lant S. Jones, Geo. W. Walcott, W. G. Magowan, and myself.

For some reason that I did not know then and do not now know, I was elected to preside over the dinner. No programme of entertainment had been arranged. Everything was left to the chairman. In order that there might be no partiality, every man present was called upon either to make a speech, tell a story or sing a song, and every man did one of those things—some of them did all three. Just before it was time to break up, some one suggested that it would be a good idea to have such dinners periodically, and pursuant to this, a committee was appointed to draft a constitution and by-laws and call for a meeting for organization. The meeting for organization was held on April 19, 1888, and the duties of temporary chairman were again imposed upon me, Mr. George F. Fagan being appointed to act as temporary secretary. The constitution and by-laws were adopted and fifty-one names were signed to the list of charter members. At an adjourned meeting, held a week later, on April 26, officers and members of a governing committee were elected; William J. Dealy, Gardner Irving, William L. Ives and Lant S. Jones were elected vice-presidents; George F. Fagan, secretary, and John Brant, treasurer. The governing committee was: J. B. Taltavall, D. W. McAncey, J. M. Moffatt and Wm. H. Baker, to serve for two years; E. F. Howell, E. F. Cummings, Conrad Meyer and T. A. Brooks, to serve for one year, and I was elected president. Among the charter members, in addition to the officers and members of the governing committee, were:

F. W. Baldwin, Geo. W. Logan, M. J. O'Leary, W. B. Waycott, S. A. Coleman, T. B. Fullon, J. L. Edwards, F. D. Murphy, T. J. Smith, W. H. Jackson, T. P. Scully, W. J. Johnston, T. M. Brennan and Harry A. Du Souchet.

Time does not permit me to go into a detailed history of the club. From the beginning it was remarkably suc-

cessful. Its constitution declares that "Its purpose shall be to cultivate social intercourse among its members." This is all that the club has ever attempted to do. I think no one will question the fact that it always has and is now accomplishing its purpose. It has never been ambitious. Its dinners have been simple and sometimes even frugal. It has not tried to educate its members or to discuss social problems or to make a business of distinguishing itself by entertaining distinguished people, though it has incidentally had as its guests of honor a good many men who may fairly be put in that class; but it has always held steadfastly to its original purpose, and I think it is just for that reason that it has been so successful and has endeared itself to all who have participated in its meetings.

Like some of its members, it is growing old—twenty years is old age for a club like this—but it doesn't feel old; it retains the spirit of youth, and I venture to hope that it may go on for another twenty years in its good work of promoting friendships and maintaining good cheer.

After referring at length to the Telegraphers' Mutual Benefit Association, which had its origin in 1867, briefly sketching its history, touching upon its growth, its development, and alluding to those who were instrumental in effecting its organization, the men who have successfully guided its affairs, Mr. Bruch concluded as follows:

The Magnetic Club honors itself in honoring the Telegraphers' Mutual Benefit Association. Indeed, in doing this, it is simply obeying the fifth commandment: "Honor thy father and thy mother that thy days may be long upon the land which the Lord thy God giveth thee," because the Magnetic Club, like all organizations in the telegraph service, is the off-spring of the Telegraphers' Mutual Benefit Association. On behalf of the Magnetic Club I express the hope and expectation that the Telegraphers' Mutual Benefit Association may live as long as the telegraph itself shall survive, steadily and rapidly increasing its power for good.

Mr. Belvidere Brooks, president of the Telegraphers' Mutual Benefit Association, in responding therefor, expressed thanks on its and his own behalf, for the fine tribute paid the association by the chairman in his remarks. Mr. Brooks dwelt upon the amount of good the organization had accomplished, stating that no one, unacquainted with the detail, could realize the splendid work, quickly undertaken, that had been performed under its auspices. The organization was, he said, the leading one of the kind in the United States.

Mr. Brooks was followed by William J. Dealy, who spoke in response to the toast of the "Past Presidents of the Magnetic Club." He said:

The Magnetic Club with what may be called its horse-shoe emblem for good luck, and its "73" for good will, celebrates to-night its twentieth anniversary. Its members and friends are congratulating one another, and well they may. In the review of its history, some recall one feature, and some another, and yet, in a way, we all drift over the entire field of the magnetic force, and influence. It has been assigned to me to respond for the "Past Presidents." Nobly, as the record shows, has each of them responded for himself. Could anyone other than Charles P. Bruch, the dean, have more beautifully pictured or described the first meeting, with all that it was to bring to us. He did not, however, tell us of his incessant interest in the welfare of the club during all these twenty years, nor that to him more than to any other one member, is due the magnificent success manifested by the brilliancy of this assemblage.

Following such a leader, the present speaker found a smooth and pleasant pathway, wherein there came together the telegraph messenger and the telegraph president, and ere he yielded the gavel, the club had changed the date

of the fall meeting to November. Later, and in due course, although not in consecutive order, two others occupied the chair. They shared with us the cheer and the glow of their own bright genial souls. They also gave boundless fame to the club. Their spirit is still with us, and as in silence we pay a tribute to the memory of Past Presidents Edward C. Cockey and Richard J. Hutchinson, let us arise; there were none better. Then at other times the emblems were entrusted to William H. Baker—but who would attempt to tell even half of what he did for them! Edward H. Johnson, electrified and trolleyized them; Francis W. Jones, duplexed, quadruplexed and multiplexed them; Colonel Albert B. Chandler, with the perfect poise of his "Magnetic" power, added to them the best that was within him, and gave to each of us individually, a goodly share of that which flows from the fullness of his heart.

No one in a short after-dinner talk, can dwell as he should upon what any of the "Past Presidents" have done, nor perhaps should any of them be given too much credit, for they all had at times, the full support and the hearty co-operation of the entire membership; but they left nothing undone for the good of the club, and they brought to these meetings guests whom nations have been proud to honor; guests foremost in science, in art, in invention; guests of prominence and achievement in the world's enterprises; and we in being privileged to meet those guests, and to hear them in their after-dinner speeches, have been favored and delighted and instructed, and in every way by means of the club, we have been made better, and broader, and brighter, and happier, so that realizing what has been done, and knowing what can be done, there is no doubt of the continued success which we all wish for our own twenty-year-old Magnetic Club.

A telegram of regret at his absence was read from George H. Usher, Atlanta, Ga., the president of the club. On motion, Theodore L. Cuyler, Jr., was instructed to send a message in reply on behalf of the club expressive of the respect and affection entertained for Mr. Usher by the members, and of the disappointment felt because of his inability to be present.

Letters of regret were read from W. H. Baker, F. W. Jones, W. C. Humstone and James Merrihew, of New York, and from W. J. Lloyd, of Chicago.

Mr. S. S. Garwood, of Philadelphia, was the next speaker of the evening, responding to the toast "Our Visitors," in which category he himself being included, he handled his subject with becoming interest and pathos.

The speech-making was brought to a close with a brief address by Colonel A. B. Chandler, after which the guests listened to a programme of music and song.

Each person present wore a decoration of a pale blue pasteboard tag bearing on one side the inscription "20th Anniversary, Magnetic Club; November 18, 1908," while on the reverse appeared the legend, "73, I'm glad I came; Shake."

Among those present were:

Albany, N. Y.—E. J. Kerwin, C. C. King and W. M. Pruyn.

Baltimore, Md.—E. W. Day and Charles Selden.

Boston, Mass.—P. J. Farrell, F. M. Ferrin, A. L. Edgecombe, T. D. Lockwood and C. A. Richardson.

Buffalo, N. Y.—H. D. Reynolds.

New York,—C. C. Adams, S. F. Austin, W. J.

Austin, J. B. Bertholf, B. Brooks, C. P. Bruch, E. B. Bruch, W. C. Burton, E. S. Butterfield, J. J. Cardona, Col. A. B. Chandler, J. F. Cleverdon, J. J. Cochrane, M. R. Cockey, J. Costelloe, Theodore L. Cuyler, Jr., M. M. Davis, J. A. Davidson, W. J. Dealy, T. L. Donovan, John Doran, B. M. Downs, A. P. Eckert, J. W. English, G. W. Fleming, T. E. Fleming, J. H. Flood, L. B. Foley, W. D. Francis, J. J. Ghegan, E. G. Greaves, S. B. Haig, W. S. Hallett, J. L. Halley, Dr. L. R. Hallock, G. A. Hamilton, T. F. Harvey, Wallace M. Hassell, T. E. Heffen, G. W. Hickey, P. A. Hickey, F. J. Howlett, J. W. Howorth, A. S. Hunter, Chas. Jacobson, E. H. Johnson, G. Johnson, A. D. Jones, James Kempster, F. G. Kernan, F. J. Kernan, E. Kimmey, G. H. Kitt, C. A. Lane, C. F. Leonard, F. E. McKiernan, A. McNeill, J. F. McNeill, D. F. Mallen, H. T. Marks, R. J. Marrin, Wm. Marshall, W. H. Mathews, C. B. Mears, M. de Mendousa, A. L. Miller, Col. Wm. A. Murray, Benjamin Nachmann, E. J. Nally, J. T. Needham, W. F. Newell, F. F. Norton, M. J. O'Leary, R. F. Parkinson, E. B. Pillsbury, R. W. Pope, G. F. Porter, A. E. Price, M. W. Rayens, E. Reynolds, John Riley, W. Scarborough, H. Scrivens, H. L. Shippy, Charles Shirley, J. F. Shugrue, T. G. Singleton, J. F. Skirrow, S. T. Skirrow, J. Smith, F. L. Sommer, T. J. Sullivan, J. B. Taltavall, Col. B. B. Thurston, E. P. Tully, J. B. Van Every, W. B. Vansize, Hugo Weise, Chas. Wessells, J. J. Whalen and Henry Zweifel.

Philadelphia.—S. S. Garwood and L. Lemon.

Pittsburg.—C. E. Bagley.

Portland, Ore.—J. F. Shorey.

Richmond, Va.—C. T. Sydnor and A. Watkins.

Toledo, O.—F. C. Hackett.

Tonopah, Nev.—M. L. McDonnell and F. G. Waterhouse.

Wilmington, N. C.—W. P. Cline.

Energizing of the Inventive Spirit.

Whatever delay there may be in public recognition and adoption of a patented idea of obvious utility, it were better that its promulgation should be made in advance of the times, rather than to be behind thereof. A laggard person, or event or declaration is always to be deplored.

We frequently hear of the inventor whose admittedly useful device, having for its object the welfare of mankind, referred to depreciatingly as being "fifty years ahead of his time," as the saying goes. If the genius who devises were more often of practical mind, could be brought to understand, and to act upon that understanding, that, as a rule, educatory influences must follow in order to make his concentered ideas commercially valuable, success in his endeavor might the more readily be attained.

The building of the Canadian Pacific Railroad across the open prairie, through dense woods and over mountain tops, was in advance of the times. Wise heads with keen vision while hoping for

success, discerning that the road would furnish the means of carrying population into the wilderness, which in turn would create abundant and paying business for the undertaking, worked diligently to accomplish that purpose. Yet there were Canadians a-plenty who criticized that great construction, declaring that the road was many years in advance of all requirements. Was it? The price of its stock to-day is eloquent in the answer it makes.

It was declared by the skeptical, the non-progressive element, whose conservative spirit, like poverty, we have always with us, that the electric telegraph invented by Professor Morse, and the telephone, given to the world by Alexander Graham Bell, were but toys, ill-defined fancies of possible somethings that at best were years ahead of their time. The inventors, however, were men of fine mould, who had abundant faith in what they had produced and lost no time in pressing their patented convictions before the world. No one needs to be told that the methods involved therein of transmitting intelligence and speech have revolutionized older systems previously maintained. The inventors were not in advance of the times. The time was ripe for the launching of their projects.

And so it is with most all meritorious inventions. They have been thought out and given to the world in obedience to the spirit of development and progress that marks the evolution and growth of human enlightenment, of higher intelligence and consequently of civilization. The belief must be accepted that they came at the proper time and in proper sequence. Satisfied with and having confidence in what they had produced, inventors who stand out distinctively as world benefactors, have been those who have realized and accepted all confronting difficulties, whether physical or of public opinion, who have overcome objection and ultimately achieved success; the indomitable pioneer spirit, shown conquering even as the valiant frontiersman successfully removes obstacles and prepares the way for future empire.

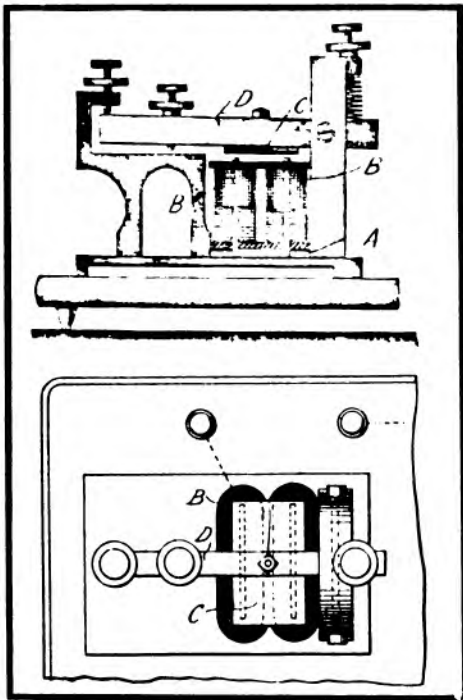
The Postal Deficit.

The annual report of Postmaster-General Meyer, of the Post Office Department, for the fiscal year, ended June 30, shows a deficit of \$16,010,270. The postal receipts were \$191,478,663, and the expenditures \$208,351,886. While the receipts exceeded those of 1907 by \$7,893,658, the annual rate of increase fell from nine per cent., where it has been for the last few years, to 4.29 per cent. This falling off, the Postmaster-General attributes to the financial disturbances of last fall.

It is said he began life as a "poor" telegraph operator; now he is the general manager of the company and is worth a million dollars. The question is, How much would he be worth if he began life as a "good" telegraph operator?

An Improved Telegraph Sounder.

A recent invention illustrated herewith shows an improved form of electro-magnet and armature, particularly adapted for use in telegraph sounders, to increase the sound produced by the apparatus. The sounder is mounted on a metal base supported only at the ends, so that it will act in the capacity of a sounding board. The core of the magnet consists of a flat plate bent to U-shape. Mounted on the two legs of this core are flat spools B, as indicated in the sketch. The armature lever D is provided with a broad armature plate C, adapted to be operated by the electro-magnets in the usual way. By using flat coils instead of the usual round coils, the poles of the magnet can be brought much closer together than usual, providing a much shorter path for the magnetic lines of force through the armature C. In this way a louder sound is produced with the same battery, or if desired, the battery power can



AN IMPROVED TELEGRAPH SOUNDER.

be cut down, for the sounder will make loud and sharp clicks with considerably reduced current. This type of magnet, while particularly designed for use in a sounder, should also be found useful in relays, electric bells, and various other forms of apparatus in which a magnet is employed. The inventor of this magnet is Mr. Lee Kiblinger, of Jackson, La. In writing to *Telegraph Age* respecting his device, he says in a recent letter that the main object of the invention is to save zinc and copper sulphate either by using one cell of battery on a five-ohm winding, or, by using two cells and have the sounder magnet wound to eight ohms. This, as he says, will be a great saving in battery, even in a few months' use, and would warrant replacing an old sounder by this new one.

The Effect of High-Tension Transmission Lines on Telegraph Working.

The Oregon Electric Railway Company, of Portland, Ore., was recently confronted with the necessity of overcoming the effects of induction from a 33,000-volt transmission line on the operation of an earthed telegraph wire strung on the same pole line, the transmission not being transposed. The Oregon Electric Railway Company handles its trains by telegraph almost exclusively, the only exception being that a telephone circuit is used as an auxiliary. Telephones are fixed in shelter shed stations and in each freight caboose, the latter being equipped with a light pole with terminals, which are hooked over the telephone circuit when it is desired to reach the dispatcher from points between stations. The telegraph circuit is fifty miles long, and is supplied with main battery at Portland from one side of a three-wire grounded neutral lighting system in the general office building and thirty gravity cells at Salem. At intervals of about every ten miles a two-microfarad condenser is connected, one side to the line and the other to the ground. According to the superintendent of the Oregon Electric Railway Company, these condensers effectually prevent the induction, and it is possible to work the telegraph through a heavy leak which would put the telephone out of commission entirely.

The life of Lord Kelvin is full of inspiration to the telegrapher, whether of land or cable. The latest volume giving an account of his scientific life, recently off the press, written by Andrew Gray, professor of natural history in the University of Glasgow, Scotland, a former pupil of and assistant to Lord Kelvin, and therefore well equipped for his task, affords a most attractive gift for a Christmas remembrance. For it presents a point of view of that noted scientist, concentrated within the limits stated, of a nature such as to render it valuable to the many who were accustomed to look up to Lord Kelvin as a great leader in the world of science. The activities of Lord Kelvin, even up to the time immediately prior to his death, which occurred on December 16, 1907, were prodigious, and the unfolding and development of his life and character along the lines of scientific thought, study and experiment, leading to discovery unceasingly pursued; the reaching of profound attainments in electrical and other research, including the telegraph, more especially in its application expressed in submarine working, in which connection he invented the mirror galvanometer and the siphon recorder—all may be traced in this delightful volume with pleasure and profit. This book, which is well printed on good paper, contains 316 pages, several illustrations, a number of explanatory drawings, and is fully indexed. It will be sent to any address, carrying charges prepaid, on receipt of price, \$1.25, by J. B. Taltavall, *Telegraph Age*, 253 Broadway, New York.

Mr. Tinker Furnishes a War Reminiscence.

Mr. Charles A. Tinker in his after-dinner speech on the occasion of the banquet at the reunion of the old-time and military telegraphers at Niagara Falls, recently, referred to his entry into the military telegraph service at the breaking out of the Civil War, and to a letter he had subsequently written to his father while on board the steamboat "Commodore" on the trip from Washington to Fortress Monroe, and thence to the James River, Believing this letter to be of interest, inasmuch as it was a record of events now of historic value, Mr. Tinker has sent a copy of the same to Telegraph Age for publication. By way of preface he says: "I will explain that on March 20, 1862, our Superintendent, Major Thomas T. Eckert, selected a force of eight operators, three from General McClellan's headquarters in Washington; three from the office at Fairfax Seminary; one from Upton's Hill (closed), and still another, eight in all. They were A. Harper Caldwell, Jesse H. Bunnell, John H. Emerick, Charles W. Jaques, Brainard H. Lathrop, Henry L. Smith, Charles Snyder and myself. Owing to various delays the steamer did not sail until April 1.

"The letter referred to is one of the many I wrote home during my service in the United States Military Telegraph Corps, nearly every one of which was carefully preserved by my father and returned to me shortly before his death many years after. They form a most interesting and detailed record of my experiences, and to me now are of priceless value.

"The envelope in which the letter was enclosed has a print in colors of "Old Glory" flying over a mounted cannon, and under it the words: 'The Old Flag—We will protect it and avenge its insults.' The picture occupied so much space that I had to write the address diagonally, and in explanation added: 'The old flag is in my way, but I would not pluck a star to remove it.'"

"On board Steamer 'Commodore.'

"Off Mattawaman Creek,

"Potomac River, April 1, 1862.

"9 o'clock P. M.

"At last the head of the long talked of (in these parts, for I think it has been kept too secret to be heralded north) expedition is on its way down the Potomac. Being one of its component parts, and knowing that you at home will look anxiously for a line from me by first mail, consistent with delays in transportation from the seat of war, I have secured a convenient place at a side table amidst the hubbub of social enjoyments in the cabin, among officers of all grades and 'stripes,' from generals down to corporals of the guard, and will drop you a few lines of my evening's recollections of the past twelve or fifteen hours, hoping you will excuse a pencil sketch, for without it you would get nothing at all, as ink is among the absent conveniences found on board this steamer.

"I telegraphed you at noon yesterday that 'I sail to-day.' So I did. At three o'clock I took a hack

from the War Department, which brought another operator and myself, with a cook. (By the way, Mr. Eckert has taken to himself 'Beverly,' the cook, who served me so faithfully at Upton Hill all winter, and he is now with us and will be our servant and cook during the summer's campaign.) As I was saying, the hack took us, bag and baggage, to the Seventh Street wharf, where we changed to the ferry for Alexandria, arriving there at six P. M. Came on board the 'Commodore' expecting to start at once for Fortress Monroe, but soon learned that 9 A. M. to-day was the hour appointed for sailing. Deposited our luggage in a comfortable stateroom. The telegraph office! You will laugh at the idea of a telegraph office on board a steamboat. Nevertheless there has been one on this boat for the last two weeks, where General McClellan has had his headquarters. I was shown to a berth, where I deposited myself for the night and enjoyed a good night's rest. Got up to breakfast at 6 o'clock this morning. It was a soldier's fare, bread and coffee and a little meat. At 9 o'clock steam was up and everything in a stir and bustle, indicating an early start, but General McClellan was not yet on board and everyone looked anxiously for his coming, knowing that until he came we must linger in expectation.

"Here I will tell you of our steamer. She is the large Sound steamer built for, and formerly running on, the Fall River Line between New York and Fall River. She is splendidly finished and considered a sea-going and staunch craft. There are on board three or four hundred officers, clerks, guards, etc., in government service, with a hundred or more servants. The boat is loaded with all sorts of war materials; horses, wagons, baggage of all kinds, and innumerable articles which no one could describe. General McClellan and staff are the most prominent of the military dignitaries. Now sitting where I can cast my eye around and see them all as they are enjoying themselves at cards, dominos, backgammon, chess and checkers, and chatting and smoking are Generals McClellan, Barnard, Williams, Barry; Colonels Hardie, Ingalls, William B. Astor, Duke De Paris, Count De Chartres, Prince De Joinville and many others I might name, less noted officers of the great Union army. Our party comprises Mr. Eckert, the superintendent, and eight operators, including myself and Beverly, the cook. We are bound for Fortress Monroe, there to accompany General McClellan's army through its southern campaign to conquer the enemy. We have laid in a stock and supplies to keep up comfortable for the next six months. I hope before that time has passed we may be released from our chosen bondage, to return to and enjoy the society of our friends left so far behind.

"Returning to my narrative: We passed the hours from 9 to 11 A. M. in discussing the prospects and expectations of our contemplated life and experiences with the army in the South, etc. At 11 A. M. President Lincoln and Secretary Seward visited the steamer and inspected her 'from stem

to stern,' and I am sure if their pleasing countenances were telltale pictures of their feelings they had not a fault to find with her appearance, nor a hope lost in her worthiness to undertake the task of conveying the head of the army and its headquarters also from Washington to Fortress Monroe. At 12, noon, we dined. At 3.15 P. M. McClellan arrived from Washington and came on board. Of course, he was welcomed by many cheers and joyful demonstrations. At 3.15 P. M. the telegraph wires were cut away, the bow and stern lines drawn in and we floated out into the stream with the steamer's bow pointed for 'Dixie.'

"The sail down the river was most delightful. For a long time Washington, the Capitol, Alexandria and Georgetown were in full view and their domes glistened in the bright rays of the southern sun. We passed Fort Washington shortly before sundown. Bands were playing and soldiers cheering and waving their caps and flags, wishing us 'Godspeed' on our journey of deliverance to those in bondage, friend or foe. A half hour later we passed Mount Vernon, the most sacred spot of earth on the American continent, where are entombed the remains of our good old father Washington, 'first in war, first in peace and first in the hearts of his countrymen!' Had he lived in 'sixty-one' I would never have sailed on a mission of war which now carries me almost beneath the shade of the weeping willow which marks the sacred ground in which he lies. 'Tis a solemn moment which finds the traveler nearing this enchanted spot, for the common and binding rule among steamboat men on the river is to stop the engine, to toll the bell and dip the ensign, as they float by. A few miles below we came to the first rebel battery (no vacated) which has been such a terror to shipping on the Potomac. Two miles below it we came to anchor where we now are, still and peaceful as at home. General McClellan has gone (out on a gunboat which came alongside) for a reconnoissance up the creek, and we are to lay here until morning. As soon as he returns we will be up and moving once again. We all like the idea of lying still to-night and getting a good night's sleep and to-morrow have a daylight view of the rest of the river and of Chesapeake Bay, which we pass through on our way down.

"I will finish and mail this letter at Fortress Monroe.

"April 3, noon. Off Fortress Monroe.

"We started at daylight from Mattawaman Creek yesterday and came leisurely down the river, entering Chesapeake Bay about 10 A. M. A gentle breeze was blowing, giving a slight ripple to the water, just enough to sway our great craft to and fro as she plowed her way through the 'briny deep.' We came in sight of the vast fleet of ships, in the midst of which we are now anchored, about 4 P. M., and then our speed slackened and we steamed down till dark, when we came to anchor where we now lie, midway between the Fortress and Sewall's Point, where the rebels

have a battery of nine guns. The morning is warm and bright, not a breath of air stirring. I would call it midsummer weather. I have stolen away into the captain's office, the key of which I have been the possessor since we started, as it contains all our valuables, instruments, stationery and other telegraphic supplies, of which I have charge, until they are distributed for use. I find no pens or ink or writing paper here, so I have 'confiscated' a few blanks (as my own paper is exhausted) and will finish this letter, now fearing I may not have another opportunity.

"I wish you could get one look of the beautiful prospect presented to view from the deck of this steamer. 'Tis magnificent, and I cannot disguise a degree of pride and satisfaction which charms me as I think of the many advantages I have for witnessing with my own eyes the wonders of the age, about which all christendom is at this moment aroused. Ships (perhaps three or four hundred) of all nations and climes are now within view. The 'Rinaldo,' famed for its part in the Mason-Slidell affair, is just to our stern, with her English ensign flying and all sails set as if in defiance. Two French men-of-war lay but a short distance to the leeward with their tri-colors flapping and steam up, as ready to take a hand in any game that may chance to invite them. The little Monitor, that pride of American chivalry and monument to Yankee genius, lies hardly a stone's throw on our larboard bow. You would laugh could you see her. The rebels call her a 'cheese-box,' but they found the 'mites' she contributed to their mess all they could digest. She is being visited by many a skiff load of officers from our steamer. We are all looking anxiously for the 'Merrimac,' which is expected out from Norfolk hourly, and we hope to witness another great fight and glorious defeat of the rebel ingenuity. The 'Monitor,' the 'Minnesota' and the 'Vanderbilt' and many smaller gunboats are ready to receive her when she shall appear. We are going right to work with our telegraph lines and hurry them along where most needed. We have brought five miles of cable to put a splice in the one now laid between here and Cape Charles, and if successful we hope to be in communication with Washington direct next week.

"The tug has come alongside to take us ashore, bag and baggage. We go right into camp between Hampton and Newport News.

"I must finish now."

Apropos of the sporadic borrowing of Telegraph Age by non-subscribers, noted in so many offices, a friend of this paper writing to us on the subject of subscriptions, rather sententiously remarks: "Operators, as you doubtless know, are frequently a difficult 'bunch' to handle, but it surprises me when managers, chief operators and others do not take the paper. I should like to make a quiet little bet that those self same people take a surreptitious peep at Telegraph Age just about twice a month."

The Storage Battery and Its Rapid Development in Railroad Service.

The principle of the storage battery was discovered in 1801 by Gautherot, who experimented with platinum electrodes immersed in a salt solution, according to the statement made in the committee report of the Railway Signal Association. Practically nothing was done to develop the principle until 1860, when Gaston Plante, a Frenchman, experimented with a cell consisting of lead strips immersed in dilute sulphuric acid. He discovered that each time the cell was charged and discharged, the amount of current given out on discharge was greater; and further still, that by charging the cell in reverse direction each alternate time, the capacity was rapidly increased. He amplified this process and was able to construct plates having sufficient capacity to make them a commercial possibility. Most of the changes and improvements of the storage battery since this time have been along these lines. Hence Plante is justly considered the inventor of the storage battery.

Plante's method of charge and discharge in reverse direction caused an increased deposit of active material on the plates due to peroxidizing of the raw lead, thus resulting in an increase in capacity. This method of forming active material from the raw lead was slow and difficult and led to the experiments of Camille A. Faure, who, in 1881, patented a process of making storage batteries by covering the lead surface with lead oxide paste instead of forming the lead electrochemically as in the Plante process. One charge only was then required to put the plates in condition to produce their final capacity. In the United States, Charles F. Brush developed simultaneously with Faure the same process, so that in this country Brush is considered the inventor and his patents here controlled the process.

All lead storage batteries are to-day produced by one or both of these processes, so that they are of the Plante type, the Faure, or a combination of both types, in which case one plate, usually the positive, is Plante, and the other Faure. Storage battery practice of to-day has therefore evolved through continuous mechanical and chemical improvements from the plates originally made by Plante and Faure.

The commercial use of storage batteries in this country on a large scale began about the year 1893. From this time on, storage batteries came into greater use, the most noticeable applications at first being in connection with isolated electric plants, Edison lighting systems and electric street railways.

In 1896 the Edison Electric Illuminating Company, of Boston, installed a battery of 8,000 amperes. This was the first big step in the use of storage batteries on an extremely large scale. Since then most of the larger Edison plants throughout the country have installed enormous batteries so that, at the present date, there are one hundred and sixty-five such plants operating,

aggregating 215,000 kilowatt hours. The use of large batteries in isolated plants and street railway plants has developed simultaneously, so that there are now in operation 1,100, aggregating 316,000 kilowatt hours.

The most prominent installation of batteries to date is that of the New York Central and Hudson River Railroad, which is now operating or installing 2,692 cells in nine batteries, aggregating 60,000 horsepower hours at the regulating rate in connection with the electrification of the steam road in New York City and vicinity.

The extensive use of storage batteries in connection with signal work on steam roads is practically confined to the past ten years. In 1898 storage cells were installed on the Pennsylvania west of Pittsburg, these cells charging from gravity cells and discharging upon the signal circuits. It is a matter of interest to note that many of these original cells are still in service.

In 1902 the Pennsylvania installed at Paoli a complete storage battery system and charging plant. The cells were located in the semaphore bases and charged from a circuit running from a centrally located plant over a wire running to each end of the division. The installation probably represents the first large installation of this character.

Both of these systems involve the use of batteries permanently located at operating points—the current for charging being brought to the batteries. This method seems to be almost universal on the eastern roads. In the west, however, not only is this method operated, but also portable storage batteries are used on a large scale, the batteries being removed at fixed intervals, to the central charging plant, recharged and returned to the operating points.

In 1900 the Southern Pacific used storage batteries of the portable type in connection with automatics. At this time a Plante type portable battery was used. This battery was of considerable weight, but was the standard at that time. There are now in service about 60,000 cells of portable batteries for signal work, used principally on western railroads.

The use of storage batteries for signal work gained very little importance for several years after their initial use. It was in 1903 that they came into general use, and since that time have increased at the rate of approximately one hundred per cent. per year, up to 1907, when little increase was made.

In 1899 storage batteries of 3,000 watt hours were installed; in 1900, 60,000 watt hours. Following this the years are as follows: 1901, 90,000 watt hours; 1902, 150,000 watt hours; 1903, 625,000 watt hours; 1904, 1,150,000 watt hours; 1905, 2,300,000 watt hours; 1906, 4,700,000 watt hours; 1907, 5,000,000 watt hours.

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The Railroad.

The twenty-fifth anniversary of the adoption of standard time by the railroads in this country, was reached on November 18.

The Lackawanna Railroad has just completed its new station at Scranton, Pa., which is one of the finest and best arranged in this country. The telegraph office is conveniently situated and is equipped with modern telegraph machinery, everything in the office being of the most approved pattern.

Recent tests on the Freeport division of the Illinois Central Railroad of telephone train despatching have been successful. Eight offices of the division were recently equipped as a result of the satisfactory operation of the system, and it is believed that, within a few months, a complete telephone system will be installed.

At the fall meeting of the American Railway Association, held at Chicago on November 18, the joint committee on interlocking and block signaling recommended, and the association adopted, a resolution that "In the opinion of the American Railway Association the substitution of the telephone for the telegraph in blocking and despatching trains can be made safely; and the use of the telephone for such purposes is recognized and recommended as a standard operating instrumentality."

J. O. Fagan, a towerman on the Boston and Maine Railroad, read a paper on "Neglect of Employes to Observe Signals and Obey Rules," at the annual meeting of the New York and New England Association of Railway Surgeons, in New York, on November 17. Mr. Fagan deprecated the theory often set forth that overwork of railroad employes was responsible for accidents, remarking: "After practical investigation I am obliged to arrive at the conclusion that, taking everything into consideration, the railroad man working at high and long pressure actually makes fewer mistakes than the man who works at normal and long pressure or on a loaf. From my point of view the engineer, brakeman or telegraph operator who is busy all the time is as a general rule more reliable than the man who is busy intermittently."

The Eastern Committee of the Association of Railway Telegraph Superintendents met in New York on November 19. Charles Selden, of Baltimore, chairman. While a number of matters were handled in executive session pertaining to questions of detail upon the various roads, the subject of train despatching by telephone was evidently the one thought that dominated the meeting. A number of reports were read from the various railroads, giving the results of their experience with train movement by telephone; also covering the use of the telephone for local railroad message business from the roads that had already supplied themselves with such circuits and with phantom circuits between large points. The results shown were so remarkably

good that the following resolution was adopted:

Resolved, That in the judgment of this association, the use of the telephone in the despatching and blocking of trains is just as safe, if not safer, than the telegraph, and in addition thereto has many advantages. Therefore, we unanimously recommend its use and its further adoption for such purposes.

The committee adjourned and met in the afternoon at the laboratory of Mr. Thomas A. Edison, at West Orange, N. J., where Mr. Edison explained to them the principle of the telephone apparatus to be used on railroads, which will largely augment the sound of conversation and give remarkably clear articulation.

The following persons represented the railroads named: N. E. Smith, New York, New Haven and Hartford; J. B. Fisher, Pennsylvania; S. A. D. Forristall, Boston and Maine; L. B. Foley, Delaware, Lackawanna and Western; E. P. Griffith, Erie; W. P. Cline, Atlantic Coast Line; W. F. Williams, Seaboard Air Line; J. S. Stevens, Chesapeake and Ohio; C. P. Adams, Southern; Charles Selden and E. W. Day, Baltimore and Ohio.

The Western Union Telegraph Company was represented at the meeting by Belvidere Brooks, general eastern superintendent, and E. M. Mulford, district superintendent, of New York, and E. B. Saylor, superintendent, of Pittsburg.

The President and the Sweeper.

When a conductor of a Lackawanna train, says *World's Work*, walked in from the Hoboken trainshed to make his report at the office, he was stopped by a tall, iron-gray man, who held out his hand with a greeting.

"Good morning, Parsons. How's the rheumatism?"

"Better, sir," said the conductor; "but I guess it will get me again in December. It always does. How are you?"

"Pretty well—and we're keeping the railroad running all right. Glad to see you are cutting down the 'lates' since the signals are working better. Keep it up. And don't forget to take care of yourself—good bye."

As he went on to the ferry, he stopped four times in fifty yards to speak to different men—a starter, a station-sweeper, another conductor, and a man in plain clothes. What he said probably did not amount to much, but it seemed to mean something to the men.

This was W. H. Truesdale, the president of the Lackawanna road. The men to whom he talked were men of the railroad staff, upon whose aggregate performances rests the reputation of the road. How much of its success is due to just this spirit shown by his greetings to his men, no one can say accurately. But it is pleasant to record that a busy president finds time enough in crossing the ferries to exchange the time o'day with station-sweepers, engine wipers, and men of the road.

The "73" Dinner to Mr. Carnegie.

On Wednesday, November 25, Andrew Carnegie was seventy-three years of age. On the evening of Friday, November 27, at the Hotel Manhattan, New York, he was entertained at a dinner in celebration of the event tendered by telegraphers, those in the service and graduates therefrom. In the note of invitation the affair was referred to as the "Telegraphers' '73' dinner in honor of their comrade, Mr. Andrew Carnegie." The occasion was a notable one inasmuch as it was a spontaneous expression of the respect and genuine affection for the distinguished guest which pervades all ranks of the telegraph. More especially, perhaps, is this noticed among military telegraphers who were contemporary with Mr. Carnegie, and in whom and between whom the true spirit of comradeship abounds, because of the fact that at the opening of the Civil War so many began their army service under him, for he was founder of the military telegraphs. Hence the title by which he is affectionately known, "Father of the United States Military Telegraph Corps."

Dinner was served at seven o'clock, the handsome apartment in which the guests were assembled being brilliantly lighted and tastefully decorated with flags, flowers, etc. Over the head table, which was placed crosswise at one end of the room, blazed the electrically lighted symbol "73." Seated at this table was Colonel Robert C. Clowry, who presided and who acted as toastmaster. At his right sat Mr. Carnegie, while at his left was Thomas A. Edison. Others at the table beyond Mr. Carnegie were: W. C. Brown, George B. Harvey, U. N. Bethell, George G. Ward, Charles C. Adams and William S. Hawk; in the line beyond Mr. Edison were: William R. Plum, Edward J. Nally, John B. Van Every, E. W. McKenna, C. H. Ackert, George W. E. Atkins and Thomas N. Miller.

Placed about the room were circular tables, each affording accommodation for eight persons. At the first table at the left front of the guests' table were seated the members of the committee of arrangements, each wearing white rosettes, to whose indefatigable efforts the success of the affair was due. These were: David Homer Bates, chairman; William J. Dealy, secretary; Belvidere Brooks, Charles P. Bruch, Colonel Albert B. Chandler, Charles A. Tinker, William Bender Wilson and James Merrihew.

The remaining tables held each its quota of guests, the assemblage altogether presenting a highly representative telegraphic gathering, included among them being numerous railroad officials of high executive position. Each military telegrapher present wore pinned to the lapel of his coat a neat little decoration in the form of a tie made up from two tiny American flags. Placed beside each plate were printed lists of the names of all those present, and to each guest was presented as a souvenir of the occasion, a minia-

ture telegraph sounder bearing the legend engraved on a metal plate fastened to the under side: "Telegraphers' Dinner, in honor of Andrew Carnegie, Hotel Manhattan, New York, November 27, 1908."

The menu pages, eight in number, and which contained the order of exercises, together with appropriate reference to the occasion and to the telegraph, bore on the front page an engraving showing the birthplace of Andrew Carnegie at Dunfermline, Scotland. Other engravings showed a portrait of Benjamin Franklin, and of Professor Morse, the inventor of the telegraph; a view of the first telegraph machine; the workshop of Morse and Vail, at Speedwell, N. J., where their early experiments were carried on in 1837, etc.

After the entry of the guests to the banquetting room, and while standing about the tables prior to being seated, the entire company united in singing "America," immediately following which a flashlight picture of the scene was taken.

The musical feature of the evening was the singing of Miss Leila Livingston Morse, a granddaughter of Professor S. F. B. Morse. She has a fine mezzo-soprano voice which was heard to great advantage, the sweetness and purity of her tones and excellence of execution arousing much enthusiasm. She has a charming presence and was the object of much social attention, as it was natural under the circumstances that she should receive.

At the conclusion of the dinner Colonel Clowry, the toastmaster, rising in his place, said:

We are here to-night to welcome a distinguished guest and comrade, Mr. Andrew Carnegie, on his seventy-third birthday, and the appropriate emblem of the occasion is our fraternal greeting "73," which means kind wishes and regards.

Mr. Carnegie began his business career in a telegraph office, and he could not have chosen a better school. The young telegraph operator has constant practice in the primary elements of education; such as reading, writing and arithmetic, and through his routine work is brought in close touch with the thoughts and methods of men of large experience in business affairs. It is estimated that seventy-five per cent. of the leading railroad managers in the United States graduated from telegraph offices, and I know of many men distinguished in other lines of business who handled the telegraph key in their youth. But whether a telegraphic education leads to high business positions or not it certainly leads to higher intelligence and knowledge of human affairs.

These meetings are conducive to good fellowship and recreation, and I always consider it a privilege to attend them and to meet so many old friends. To Mr. Carnegie, our guest of honor, and to every other person here to-night, I say most heartily "73," or, God be with you.

The first speaker of the evening to be introduced was Colonel William R. Plum, who delivered a lengthy and scholarly address. He referred to the wonderful accomplishment of this age of electricity and steam, of a higher and broader advancing civilization, in the later promotion of which Mr. Carnegie, the guest of the evening, had been so forceful, so generous and so manly heroic an agent, paying fine tribute to his character, and

the intelligent and magnificent use he had made and was making of his vast wealth—"one of Morse's messenger boys rising from the healthful glow of enobling poverty." In concluding Colonel Plum said in part:

Comrade telegraphers, graduate and undergraduate, as our civilization is heavily charged with redeeming energies, so the electric tongue, speaking all languages and ignoring distance, is conveying the thoughts of mankind in all directions by telegraph and cable, telephone and wireless throughout the United States at the rate of 13,431,100,000 communications per annum, of which at least 389,000,000 are telegrams or other long-distance messages or conversations, and the cry is more.

Over six billions of pieces of first-class mail matter, of which seventy-seven millions were foreign, and four and three-quarter billions of printed matter passed through our post offices last year, and the cry is more, more.

About eighteen million miles of wire are in use by telegraph and telephone companies in the United States alone, and over 231,000 miles of cables, largely ocean, contract the world, but the cry is more, more, more. Approximately the same local conditions prevail in other countries. Even China is waking up and has 75,000 miles of telegraph wires. Steamships are multiplying and the wireless locates them as they move in their orbits about the globe.

Half a million miles of railroad furnish land transit for the world's passengers and freight, of which 224,363 are in the United States carrying over 800,000,000 passengers and the cry is more, more, more, more.

Ten billion, three hundred and twenty-five million, one hundred and forty-three thousand, one hundred and eighty-eight newspapers were published in the United States in 1905, of which over seven billion were dailies replete with telegraphic advices, but the demand increases. Other countries vie with us in their own marvelous facilities for interchange of thought and merchandise as well as passenger traffic.

"Time and space," wrote Mr. Carnegie, "are already annihilated by electricity, and steam is rapidly making the world one vast neighborhood." "Day unto day uttereth speech, and night unto night showeth knowledge."

With such a spread of intelligence, the subject is fast becoming a citizen, the citizen a king. Where the people do not now, they will rule. Figure-heads may occupy thrones for a time, dedicate public works and preside over the activities of a nearly useless social aristocracy, but the handwriting is on the wall. Intelligence, and one vast brotherhood of man follow in the wake of electricity and steam. Encouraged by the gospel of wealth, triumphant democracy, made possible by electricity and steam, disseminators of knowledge and the decrees of peace universal, four in hand, will go round the world in the chariot of Morse and Watt, led by Aurora, and spread with garlanded hands the light of the Sermon on the Mount, the fatherhood of God and the brotherhood of man.

Forty-seven years ago, he whom we especially honor to-night, took the initial steps toward the formation of the United States Military Telegraph Corps, which during our Civil War constructed and operated fifteen thousand miles of telegraphs, one thousand of which were field lines, transmitted six million telegrams, many in cipher, and recorded the history of the war as that of none other had ever been done. History affords no parallel of so powerful a foe operating along so great a front being finally overcome.

Surrounded by the deadly waters of the Peninsula and Yazoo, amid the whistling bullets and shrieking shells, in lonesome and unguarded places, with cavalry deep in the enemy's country, with infantry in the rifle pits and advanced parallels, yea even in the front of actual battle and at all important headquarters, the brave operator, faithful as the electric current itself, served

his country uncomplainingly. The student of military history will find cause to doubt the possibility of Union success unaided by the telegraph corps. I do not hesitate to affirm that without such a courier successful co-operation would have been impossible. No other arm of the service was ever so confided in and none other ever dismissed by a civilized government with such lack of manifest gratitude. Even now the richest government on earth leaves it to the "Father of the Corps" to pension his needy children in their old age.

Glory and honor and long life to the great soul that was not appalled even in assuming the obligation of eighty-odd million of people.

Remarks of David Homer Bates:

In all probability I am the only person present this evening who learned the art of telegraphy in the superintendent's office at old Outer Depot, Pittsburg, which was burned by the rioters in 1877 in our country's first great railroad strike. Mr. Carnegie had just been appointed superintendent of the Pittsburg division of the Pennsylvania Railroad. This was in 1859, only ten years after his entry into the telegraphic service as a messenger. My friends, there are very few links in the chain of telegraphic history. Let me mention three of them: First, Benjamin Franklin was born two hundred years ago in the little town in Massachusetts named after King Charles. Always of an inquiring turn of mind, in 1752 he flew his kite into the empyrean to prove that heaven's mighty lightning flash and man's puny electric spark were one; second, Joseph Henry in 1832, at Albany, demonstrated that the earth's natural magnetism was identical with that produced by the passage of an electric current through a wire around an iron helix; third, in 1790, one year after Franklin's death, Samuel F. B. Morse was born in Charlestown, within a stone's throw of Franklin's birthplace. In 1837 Morse joined the two links which Franklin and Henry had forged to a third link in the marvelous chain. At that time our honored guest was an infant in his mother's arms. Morse and Vail carried on their experiments in the humble workshop in Speedwell, New Jersey, which is pictured on the back of our menu card.

Out of these conceptions grew the mighty giant of the telegraph whose Briarean arms now encircle the globe. The name—Speedwell—carries with it a prophecy of fulfillment of Puck's promise to Oberon: "I'll put a girdle round about the earth in forty minutes."

In our telegraphic code the signal "13" means, "Do you understand?" When Andrew Carnegie was thirteen years of age, he, like Franklin before him, wanted to understand all about things electric, and so he became a telegraph messenger and was soon afterwards an operator. That, my friends, as he recently told me, was the turning point in his career, for his duties in the telegraph office brought him into close and frequent contact with Thomas A. Scott, that prince of railroad men, with whom he was thereafter associated for twenty years, during which formative period Carnegie laid the firm foundation of his future wealth. Surely there was a tide in his affairs which, taken at the flood, led on to fortune.

One supplemental link in the telegraph chain may be mentioned, namely, the Military Telegraph Corps, of which Mr. Carnegie was one of the founders, his message from Washington in April, 1861, calling for operators for the army having been answered by nine young men from his line, four of whom are long since dead, namely, David Strouse, our first superintendent; Samuel M. Brown, Albert C. Snyder and William E. Tinney. The other five are expected to answer to their names this evening, namely, Colonel William Bender Wilson, Colonel James Ross Gilmore, Richard O'Brien, Jesse W. Crouse and your speaker. This was the nucleus of the corps. Other operators followed from various sections of the country, until at the maximum our corps numbered 1,500, our average age being under twenty. All have passed away

but about two hundred, many of whom have reached or gone beyond the psalmist's limit of three score and ten. Out of this small remnant there are with us to-night a few members who, with some of our sons and grandsons, may be distinguished by the red, white and blue colors of "Old Glory," worn with pride upon our breasts.

Although we helped to save our country in the Civil War, which ended over forty-three years ago, we have not yet been given a pensionable status in the United States Army, of which in fact we formed a component part. We asked Congress for bread and received a piece of paper, having been awarded a certificate of honorable service in 1897, thirty-two years after the Civil War's close. One of these certificates stands in the name of Andrew Carnegie, who, no doubt, prizes it as highly as, perhaps more highly than, any of the finely engrossed encomiums from the innumerable recipients of his world wide bounty.

Until Congress shall recognize the justice of our claims and pass the measure so long slumbering in the House committee room, Andrew Carnegie has taken the place of the government and, commencing January 1, 1908, he has consented to send a private soldier's pension check—\$144 per year—to each one of his needy comrades whose application has received the approval of the executive committee of our corps. Up to date the committee has approved sixty-nine applications. The names of these comrades are held sacred in our files and are unknown to each other or even to Mr. Carnegie, except perhaps incidentally.

No one can ever know, it is not possible even to imagine, the vast amount of comfort already secured to these needy and worthy beneficiaries and their dependent families.

All honor to our first Chief, our Benefactor and always our Comrade and Friend!

Colonel William Bender Wilson spoke as follows:

There is a charm to me in looking back upon the days of my telegraphic career and calling to memory the comradeship of those who manipulated the key. The telegraph operator of the fifties and sixties was a force in the community. He was proud of himself, proud of his profession and, in the language of our late comrade, Lew Somers: "There was an esprit de corps which held him up to a high standard, lest he bring dishonor on the good name of the profession, and upon his compeers whose good opinion he valued. There was a bond of brotherhood which required no vows to make it strong. The mystic chord which bound them so closely together in good fellowship perhaps had its birth in the mystic fluid which brings those afar off into close personal touch. Its subtle charm is felt now as it was then, and will ever hold in closest friendship the true brotherhood of telegraphers."

In the year 1852, under appointment of James Douglas Reid, I entered the service of the Atlantic and Ohio Telegraph Company at Harrisburg, Pennsylvania, as messenger. I was proud of the position, as it seemed to be the opportunity I longed for of connecting myself with the thought of the great world which pulsed over the iron threads. In that office I learned to telegraph and soon became an operator, and three years later I was sent by David Brooks to open an office at Wilmore, on the western slope of the declining spur of the Allegheny Mountains. On that Pennsylvania Railroad line there were but four other offices, Altoona, Gallitzin, Johnstown and Outer Depot, Pittsburg. Robert Pitcairn presided at the first and Andrew Carnegie at the last-named office. In addition to being the telegraph operator each was secretary to his superintendent, and both developed as by intuition a mastery of rail transportation. It is but justice to say of those Scotch boys that they were influential factors in preparing the foundations for, and building thereon, that splendid system of transportation which lifts with ease the traffic of a

continent over a mountain whose summit is 2,200 feet above the level of the sea. The first message I sent from Wilmore was from Colonel Bopp, the agent, to Superintendent Scott, at Outer Depot, and I yet hear the clear Morse of the acknowledgement signals, i. e. o. k.—A. C. That was my first contact with Mr. Carnegie, whom I soon learned to love for his sterling character and manly worth, and to-day, as the shades of three score years and ten are enveloping me, I still love, honor and respect him for those qualities, the intervening years having only strengthened my original feelings toward him.

In retrospective view of my life at Wilmore there looms into prominence two figures, Thomas A. Scott, the superintendent of the western division of the Pennsylvania Railroad, and Andrew Carnegie, his right-hand man. The former was then thirty-one years old and the latter twenty. Mr. Scott, who became the most brilliant railroad manager of his day—a man I loved in life and whose memory I revere—was then but fairly entering upon his famous career, and was most fortunate in having Mr. Carnegie for his confidential aide. They seemed to possess many characteristics in common, both possessed untiring energy, boundless resources, quick decision and strong nerve; both were ever ready to assume great responsibilities and carry them to a successful issue. It was a splendid and unmatched combination, each being necessary to the other to complete the successful whole in the production of positive results. Mr. Carnegie's subsequent career is well known, as is the fact that his success in life is due to his native ability and forceful character. It is to those qualities that the credit is due for the great work he has done toward the advancement of man. His desire, to see a universal brotherhood of man, living in peace together, is not an emotion of yesterday nor to-day; it was inborn in him of a parentage to be proud of and if he had not a dollar in the world he would strain every faculty to gratify that desire. The man in him would have proclaimed itself under any and all circumstances, and had he never seen a steel mill, his star would shine with the same if not greater brilliancy as the most notable philosopher and the greatest apostle of peace and good will in the world to-day.

We are here to-night to celebrate the seventy-third anniversary of his birth, and to commemorate the fact that in early life he was a telegraph operator. With that in view, I desire to say to him: (Here Colonel Wilson addressed Mr. Carnegie.)

Emperors, kings and savants of the world have greeted you; captains of industry, trade and finance have bowed before you; statesmen and scholars have consulted you, and the poor have called you blessed, but nowhere have you been so thoroughly understood and highly appreciated as in the family of the telegraph, and as I say I love you wholly and solely because you are Andrew Carnegie, I but breathe the sentiment that animates the hearts of all the fellows of your early craft, who surround this board. As we lay this loving tribute on your heart we utter the wish that you may have many more years of a useful and happy life.

William J. Dealy said:

It may be that there is nothing new under the sun. Thales, 2,500 years ago, found that friction applied to amber, for which the Greek word is "Elektron," developed both an attractive and a repellent force. But through all the years since, up to within about "seventy-three," nothing in electricity or in anything else, compares with the progress made in the lifetime of those whom we affectionately class as the "Forty-niners" of the telegraph, and of whom, several are with us here to-night. Well do we all remember the light of other days, and contrasting it with the incandescence, or the arc of to-day, there instantly comes to our minds a picture, telling that everything is new when viewed from the standards and methods, and

means, and appliances of the long ago. Not only in the light do we see the change, but in the power, and in the energy; and in the inventions and in the activities that cover every field, and that supply every need and that extend, that expand, and that create varied and colossal industries, uniting all mankind as brothers, and making them as partners in interest, in the world's enterprises.

There was very little of what we now understand as commerce prior to the pulsations of the telegraph through the forests, and over the hills, and across the mountains, and under the seas, pulsations that cleared the way to the resources and hidden treasures of every land. No force has ever given such stimulus to development and transportation as that of the wires; no other could make possible the commerce of today, nor could guide and control and lead it, as the telegraph does. But, achievements are "not attained by sudden flight," and so, our "Forty-niners," except perhaps our honored guest, were not in the beginning expert in manipulating the key; its mechanism was somewhat heavy for rapid work, the early conditions generally were not favorable for speed. The paper tape upon which was embossed the long dots, and the longer dashes, leisurely and with a sometimes exasperating regularity rolled from the register, gracefully though often uncomfortably winding itself around them, but with a persistency in study and labor, they forced improvement, and when the tape was abandoned they were charmed with the sound of a fascinating song. Then one by one, the conversational signals which those "Forty-niners" had previously used became unnecessary. But there was one which they retained, and which they and we regard as the fraternal sign of the craft, harmonizing and vibrating with every friendly tradition and chord of the wires.

There are in our language words that are sublime in their meaning, words that are as euphonious as chimes from silvery bells; words that seem to fall as velvet on the cheek; words that flow in ecstasy and delight from the poet's pen; words that picture the happiest scenes of our lives; words glowing with sympathy, comfort, contentment and joy; words that are radiating, responsive and echoing with all that is affectionate and endearing, as well as with all that is inspiring to courage, and hope, and strength. But to a telegrapher they are all combined in the simple numerals, the magic signal, "73." There are no words to fully define it, we can only say of it, that it is expressive of all that impels us in the direction of the brotherhood of man, and although emblazoned on the escutcheons of many, it is only in the deeds of the few, entwined, but pre-eminently and in all its splendor, it is woven in the years of Mr. Andrew Carnegie.

Richard O'Brien, of Scranton, Pa., who was next introduced, said he had never been much given to speech after a very early experience with Mr. Carnegie. That was when Mr. Carnegie was assistant to Mr. Scott, and Mr. O'Brien a night operator along the line of the Pennsylvania Railroad. There was an accident and somebody got the blame—the wrong man Mr. O'Brien thought. So he butted in in defense of the accused and found that he was all wrong. To him Mr. Carnegie had said:

"Richard, if you want to succeed in this business you'll have to keep your mouth shut, and always remember that a close mouth is a sign of a wise head."

Mr. O'Brien then went on to state how Mr. Carnegie called the boys on to Washington who formed the basis of the famous corps and how he had himself been the chief operator at Fort Monroe and in charge of the Union lines in Vir-

ginia and North Carolina during a great part of the struggle between the North and the South.

Charles P. Bruch was introduced as the son of Samuel Bruch, who had charge of all the Union telegraph lines in Tennessee and Kentucky. Mr. Bruch spoke on "The Telegraph; Pioneer in Modern Progress." After a graceful reference to the guest of the evening, he said in part:

This is a birthday celebration and it is permissible on such occasions to look backward—to count successes and perhaps to mourn failures. I think, however, that the telegraph has no failures to mourn, notwithstanding what the gentlemen who file claims for errors may have to say.

The telegraph is only sixty-four years old. There are many still living and active who were men grown when Morse gave his invention to the world. Perhaps some of them are present here to-night. The first student of telegraphy on the first telegraph line ever erected, who later was the builder of the first telegraph line into New York City, is still living at ninety-one years of age, and has his home only a few minutes' ride from this spot. I refer to Orrin S. Wood.

The telegraph service is a university. It gives a liberal education. Its pupils gain practical knowledge and training in loyalty, self-reliance, courage and all qualities that make for usefulness, and go out to take their places as efficient workers in every field of endeavor. Hundreds of men who regard the telegraph as their alma mater are foremost in business, science, the learned professions and in public service.

Colonel Albert B. Chandler, who was introduced as the pioneer of the Postal Telegraph-Cable Company, spoke briefly, paying a warm tribute to the manhood qualities, the life and example of Mr. Carnegie.

Mr. Carnegie when introduced and in rising to speak, was greeted with prolonged applause. He said in part:

This is the greatest public honor that has ever been conferred upon me. I don't value so much the tributes of officials who have to say something pleasant by reason of their position. But I can find a note of sincerity in the kind words I have heard to-night, which thrills me when I think that there is no triumph so real as to receive in your mature years, in your old age, the testimonial of those who were the friends of your boyhood—there is no such testimonial as that to be found anywhere in the world. I'd rather take your certificates for my warmheartedness, my sincerity, my earnestness, and my honesty than all the signatures of all the prominent men I can think of. And when it comes time for me to cross the border I'd rather take as my passport your certificate, as my boyhood friends, who have known me from the start, than the certificates of all the priests and bishops I could find by searching from one end of the world to the other. I must say with Hamlet, "I think myself in nothing else so happy as thinking of my dear friends."

Mr. Carnegie told, among other things, how he came to be admitted to membership in the Authors' Club. It was shortly after his first book came out, and when his name was proposed a representative of a publishing house objected on the ground that millionaires couldn't write books, and had secretaries for that purpose. At the next meeting a man from the publishing concern which brought out the volume produced some of the original manuscript in Mr. Carnegie's handwriting. Whereupon a fresh objection was made that

the Authors' Club was an organization of authors, not millionaires. "Then," said Mr. Carnegie, "some one commented that while I might be a very rich man, I was a mighty poor author, and I was elected."

Mr. Carnegie paid a tribute to Thomas A. Edison, whom he said sits by himself among inventors. He also referred in pleasant vein to Colonel Robert C. Clowry, W. C. Brown, C. H. Ackert, E. W. McKenna, as well as calling the names of a number of former Pennsylvania Railroad and telegraph employes, who had been kind to him as a boy.

Before breaking up the following verses, transposed from Auld Lang Syne by Marion H. Kerner and dedicated to Andrew Carnegie on his seventy-third birthday, were sung:

Should auld acquaintance be forget
And never brought to mind,
Should auld acquaintance be forgot
And the days of Auld Lang Syne?
That good old song to mem-ry dear
Shall ever welcome be,
We'll blend its notes fraternally
With cherished Seventy-Three.

For Auld Lang Syne, dear boys,
In tuneful harmon-y,
Breathes Friendship, Love, Good Fellowship,
When joined with Seventy-Three.

God grant our honored guest the peace
His life has fairly won,
And crown him with Thy blessings
For the noble deeds he's done.
'Tis not a nation—but the world
To him should grateful be,
Oh! may he live yet many years,
Sustained by Seventy-Three.

For Auld Lang Syne, dear boys,
In tuneful harmon-y,
Breathes Friendship, Love, Good Fellowship,
When joined with seventy-three.

Among those present were:

Ashtabula, O.—Charles W. Jaques.
Atlanta, Ga.—Jacob Levin.
Baltimore, Md.—Charles Selden.
Boston, Mass.—Stephen E. Barton.
Buffalo, N. Y.—Harvey D. Reynolds.
Chicago.—Theodore P. Cook, Edward W. McKenna, A. H. Bliss.
Lombard, Ill.—Col. William R. Plum.
New Haven, Conn.—Orry M. Shepard.
New York.—Charles C. Adams, George W. E. Atkins, John C. Barclay, David H. Bates, David H. Bates, Jr., James R. Beard, Albert Beck, A. T. Benedict, James Bertram, U. N. Bethell, A. R. Brewer, Belvidere Brooks, W. C. Brown, Charles P. Bruch, Edward B. Bruch, Andrew Carnegie, Albert C. Case, Col. Albert B. Chandler, Albert F. Chandler, Willis D. Chandler, Col. Robert C. Clowry, Theodore L. Cuyler, Jr., Charles H. Davis, Minor M. Davis, William J. Dealy, Charles C. Dickinson, S. S. Dickenson, F. A. Duneka, Thomas A. Edison, Thomas E. Fleming, R. A. Franks, Frank S. Gannon, William Gellatly, John J. Ghegan, George A. Hamilton, Geo. B. Harvey,

W. S. Hawk, W. R. Holligan, William Holmes, Edwin F. Howell, Gardner Irving, James Kempster, Marion H. Kerner, Thomas M. King, V. J. Knittle, F. T. Leigh, Daniel B. McCoy, T. Commerford Martin, William Maver, Jr., James Merrihew, Charles E. Merritt, Thomas N. Miller, E. M. Mulford, Edward J. Nally, Michael J. O'Leary, C. F. Patterson, Edward B. Pillsbury, Ralph W. Pope, Henry A. Reed, J. C. Reilly, Edward Reynolds, H. E. Roberts, William D. Sargent, Ashton G. Saylor, Franklin J. Scherrer, Capt. W. A. Sheldon, John A. Sleicher, V. C. Stanley, Joseph W. Stover, John B. Taltavall, A. L. Tinker, Charles A. Tinker, Charles Trippe, John B. Van Every, John R. Van Wormer, George G. Ward, M. T. Wilbur and William H. Woolverton.

Philadelphia, Pa.—Jesse W. Crouse, George W. Snyder, and Col. William B. Wilson.

Pittsburg, Pa.—George A. Cellar, N. E. Church and Elgin B. Saylor.

Rome, N. Y.—Albert W. Orton.

Scranton, Pa.—Thomas E. Clarke, Dr. John E. O'Brien and Richard O'Brien.

Titusville, Pa.—Daniel Colestock.

Tonapah, Nev.—F. G. Waterhouse.

Toronto, Ont.—Isaac McMichael.

Washington, D. C.—C. H. Ackert, Major J. Orton Kerbey and Jesse H. Robinson.

Westfield, N. J.—James N. Worl.

There is always a constant demand for books treating on the general subject of electricity from a point of view and in a manner making clear information that the average individual desires to know, but which he frequently finds so difficult to obtain. A volume of this character which is not amateurish in expression, but which, while not designed for experts, is nevertheless valuable to the seeker after knowledge, is prized by those whose opportunities for gaining information on the several branches have been limited. Such a book is "Electricity Made Simple," by Clark Caryl Haskins, the well-known electrical writer. The dedication illustrates the democratic purpose of the author, for it reads, "To my many friends in blouse and overalls, with kindest remembrances." The volume is bound in paper covers, embraces nearly 240 pages, and in its twenty-one chapters, and 108 illustrations, touches upon and illuminates a variety of topics such as are seldom so comprehensively assembled in a single volume. When it is considered that the cost of the book is but fifty cents it will be seen that this low price puts it within the reach of everyone. It will be sent postage paid on receipt of price. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

The testimony of progressive operators is that TELEGRAPH AGE is so thoroughly comprehensive in character as to make it absolutely indispensable to those who would keep informed. Its technical articles are of high practical value. Write for a free sample copy.

LETTERS FROM OUR AGENTS.**PHILADELPHIA, POSTAL.**

Miss Ella Cadwalader has been appointed stenographer to Manager J. A. McNichol, vice B. H. Moore, who has resigned to enter other business. For the past nineteen years Mr. Moore has held the positions of chief clerk in the superintendent's and manager's office. He also was manager of the Baltimore office for a period of four years during this time.

On account of failing health Mr. H. Thompson was compelled to relinquish his position as traffic chief. Mr. M. N. Redding, night wire chief, has been appointed in his stead. Mr. M. A. Baker, who has been away on account of ill-health, has returned much improved and has received the appointment of night wire chief.

Operator Charles W. Williams has returned to his home in Niles, Mich., on account of failing health.

Messrs. Price, Beasley, Ray, Mason, Nunneville and Auerbach, who went to Princeton to send the reports of the Yale-Princeton football game, deserve commendation for the splendid work they did under adverse weather conditions. They worked faithfully out of doors during the sleet, snow and cold rain until their work was finished.

TOLEDO, O., WESTERN UNION.

Harry Grime, aged twenty-four years, an operator in the employ of this company, died on November 6.

Mr. E. H. Someroak, an operator in the local Produce Exchange office, left November 10, for Seattle, Wash., where he will in future make his permanent residence.

NEW YORK, WESTERN UNION.

Mr. T. A. McCammon, chief operator, has returned from Canada, whither he was called to attend the funeral of his sister.

Mr. C. W. Hanson, assistant chief of the gallery, who has been ill, is now convalescing at Lakewood, N. J.

The sympathy of the force is extended to D. W. McAneeny, assistant wire chief of the eastern division, whose wife died on Sunday, November 22. The interment was at Utica, N. Y.

Mr. Ralph Dacosta, for many years a member of the all night force, died on Saturday, November 21, from blood poisoning. Mr. Dacosta had been ill but a few days, and his sudden death was a great shock to his many friends.

The mother of C. A. Meyer, chief of the eastern division, died on November 7, at the venerable age of ninety years. Her funeral was attended by a number from this office.

Misses Edith Thomas and Irma Jones, operators in the main office at New Haven, Conn., were among those from out of town who attended the Aid Society reception recently. Subsequently they were visitors at this office, where they have numerous friends.

Another recent visitor was Miss Helen Haydock, of the Minneapolis, Minn., office.

NEW YORK, POSTAL.

Among the recent arrivals are C. A. Balsley, former Postal manager at Syracuse, and Miss Grace M. Munn, a former incumbent of this department, and E. W. Applegate, an old-timer and well-known electrician.

Mr. Charles E. Mix, who worked for this company for the last five or six years, has accepted a more lucrative position with one of the railroad companies.

OTHER NEW YORK NEWS.

The reception and entertainment given on the evening of November 10, by the Telegraphers' Aid Society, in behalf of the relief fund maintained by that organization to assist sick and needy telegraphers, not members of any organization, proved to be such a pronounced success, both from a social and financial point of view that Robert J. Marrin, vice-president of the society, and chairman of the entertainment committee, desires publicly to express his personal appreciation of and thanks to those who by their efforts and presence contributed to make the occasion so enjoyable, and happily so successful in the amount of money realized for its worthy object.

Mr. E. W. Griffith, son of E. P. Griffith, superintendent of telegraph of the Erie Railroad, New York, was married on November 17, to Miss Alice Maud Stark, of Passaic, N. J. Mr. and Mrs. Griffith are now making a wedding tour through the Southern States. Mr. Griffith is an attaché of the electrical laboratory of the Western Union Telegraph Company, 195 Broadway, New York.

J. J. Kelly, aged thirty-eight years, a former manager of the American District Telegraph Company's office at 8 West Twenty-third street, New York, died on October 14.

Mr. George M. Eitemiller, the well-known old-time telegrapher, who has been identified with the telegraph service at Pittsburg for the past thirty years, has accepted a position with the Interstate Long Distance Telephone Company, at Detroit, Mich.

The Serial Building Loan and Savings Institution will hold its regular December meeting of shareholders at the office of the corporation, 195 Broadway, New York, on Tuesday, December 15, for the purpose of nominating officers and directors, the same to be voted for at the annual meeting of the shareholders to be held at the same place on Tuesday, January 19, 1909. In a ringing circular note incident to the occasion, addressed to the membership, President J. C. Barclay makes a number of very pertinent allusions to the standing, the growth, the opportunities and the future of the institution.

The Electric Building Loan and Savings Institution will hold its regular December meeting of shareholders at the office of the corporation, 253 Broadway, New York, on Friday, December 11, for the purpose of nominating officers and directors, the same to be voted for at the annual meeting of the shareholders to be held at the same place on Friday, January 8, 1909.

Obituary.

Edward J. Sullivan, aged thirty-seven years, a telegraph operator employed at Milwaukee, Wis., died on November 13.

W. T. Heard, aged fifty-seven years, manager of the Western Union Telegraph Company at Florence, S. C., for the past thirty years, died of consumption on November 16.

Sidney Edward Morse, formerly the editor of the New York Observer, a son of the founder, and a nephew of Professor S. F. B. Morse, the inventor of the telegraph, died in New York, November 14, aged seventy-three years.

Oliver Hart, a member of the firm of Charles Head and Company, bankers and brokers, New York, died November 14, in the forty-second year of his age. He entered the employ of the firm of which afterwards he became a member, as a telegraph operator.

Telegraph Age Borrowers Read This.

Mr. D. L. Graham, of Canal Dover, Ohio, a subscriber of many years' standing of Telegraph Age, evidently has suffered the too common annoyance, complained of by others, of having his copy of the paper borrowed by selfish readers, who will not themselves subscribe for it, for in a recent letter he is moved to say: "If you wish to keep abreast of the times subscribe for Telegraph Age; if you don't have snap enough to subscribe, don't borrow your neighbor's paper." With this declaration off his mind Mr. Graham proceeds to lay down a few level-headed bits of wisdom after this fashion: "No other man can climb the ladder of success in your behalf, work out your own salvation. Some men will argue: 'What's the use paying \$2 per year for Telegraph Age when we can send and receive with perfect ease.' God pity the telegrapher if that is all he knows and can do. I have been a telegrapher for seventeen years past, and believe I can send and receive with the best of them. But my aim is to learn something more than this in the broad field of telegraphy. Telegraph Age has been to me an efficient help. Any operator will derive abundant and substantial benefit if he will heed its teachings, and follow closely all that Mr. Jones has to say in every issue under 'Some Points on Electricity.'"

Mr. Otto Holstein, a subscriber of Telegraph Age, located at Cerro de Pasco, Peru, in a recent letter, states that this paper is appreciated by him in those high altitudes. He says: "Ours is probably the highest telegraph line of any in the entire world; the wires at no place are below an altitude of 12,000 feet and rise from that height up to close to 15,000 feet. Right here at Cerro de Pasco, the elevation is 14,208 feet above the level of the sea. We experience some very interesting natural electrical phenomena and its effect on the telegraph and telephones is remarkable."

Mr. E. B. Pillsbury, general superintendent of the Postal Telegraph-Cable Company, New York, sends us the following letter: "I enclose renewal of my subscription for the twenty-fifth time. Your journal is always a welcome visitor, and I never fail to find interesting and helpful matter in its pages."

The Serial Building Loan and Savings Institution, 195 Broadway, New York, invites correspondence with telegraph operators, city or country, who desire to open a bank account. Organized under the laws of the State of New York, it offers an absolutely safe depository for money, on which five per cent. will be paid. It extends "fraternal" aid in procuring homes under attractive and exceptional conditions.

Advertising will be accepted to appear in this column at the rate of twenty-five cents a line, estimating eight words to the line.

Yuba Consolidated Gold Mining Co., a recently effected consolidation of three contiguous properties in California, well developed, 23 claims, 60 stamps, good equipment, now producing. Dividends soon. I offer 5,000 shares, subject to reservation, at 30 cents; par \$1.00. Can recommend. R. Hitchcock, Box 1765, New York City.

Reward: A reward is offered to any person furnishing information as to the whereabouts of Operator E. J. Hamilton. Address "Z," care Telegraph Age.

Will buy or sell, in one to ten-share lots, Western Union Telegraph Company and Mackay Companies, stocks. Remittances by New York draft or express money order are requested. Address "Stock Investment," care Telegraph Age, 253 Broadway, New York.

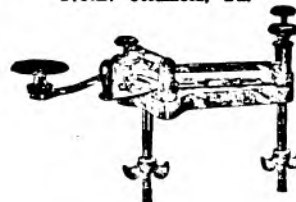
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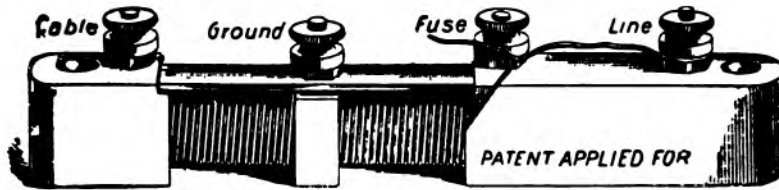
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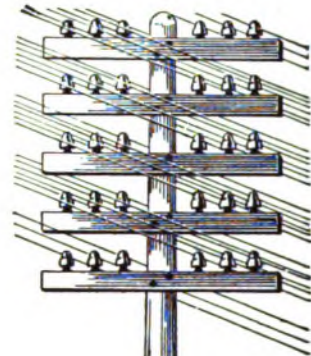
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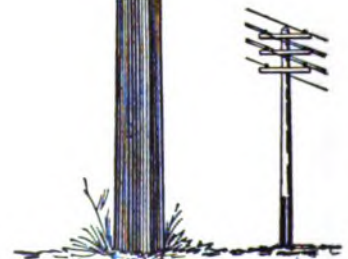
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TELEGRAPH AGE has published the best articles on telegraphic subjects that have ever appeared in print. Here-with are enumerated a few of the most important subjects treated, together with the date of the papers containing the same. Copies of these back numbers may be had at twenty-five cents apiece upon application. Address J. B. Taitavall, TELEGRAPH AGE, 253 Broadway, New York.

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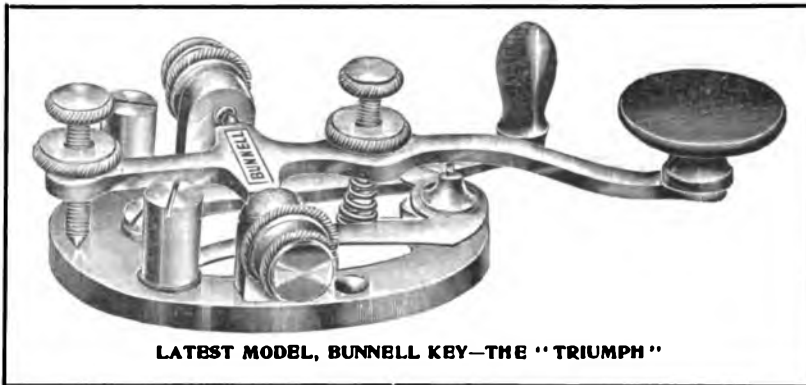
Directory of Annual Meetings.

- Association of Railway Telegraph Superintendents meets at Detroit, Mich., June 23, 24, 25, 1909.
- Commercial Cable Company meets the first Monday in March, at New York.
- Gold and Stock Life Insurance Association meets the third Monday in January, at New York.
- Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.
- International Association of Municipal Electricians meets at Atlantic City, 1909, at a date to be named later.
- Old Time Telegraphers' and Historical Association, will meet at Pittsburg, Pa., at a date to be named later.
- Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.
- Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.
- Train Despatchers Association meets in 1909 at Columbus, O., at a date to be determined upon.
- The stockholders of the Western Union Telegraph Company meet the second Wednesday in October, at New York; election of officers occurs on the third Wednesday in October.

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No. 24.

NEW YORK, DECEMBER 16, 1908.

Twenty-fifth Year.

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Accordingly the local battery circuit containing the magnet of the Chicago polechanger is extended and connected through the contact points of the Boston relay. The Chicago polechanger and the Boston relay thus hold the same relative position towards each other that an ordinary sounder does to a single line relay, and as the Chicago polechanger now works in unison with the contact points of the Boston relay, it is obvious that the former will repeat to Chicago every signal arriving from Boston. As the Boston polechanger and the Chicago relay are similarly connected signals may be simultaneously transmitted in the opposite direction in the usual manner of duplex operation.

While the connections in the diagram show the manner in which they are usually made where the arrangement is to be permanent, the method

SOME POINTS ON ELECTRICITY.

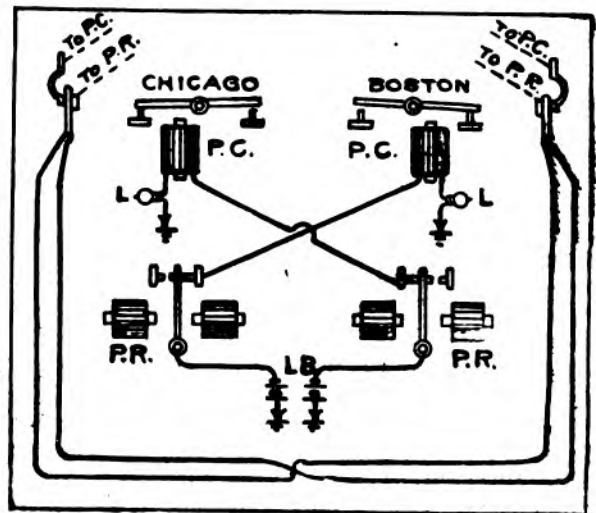
BY WILLIS H. JONES.

Elementary Lessons Concerning the Connections and Operation of Repeaters.

(PART IV.)

One might naturally infer that the connections and arrangement of apparatus necessary to cause one multiplex set to automatically repeat or duplicate its signals in another multiplex circuit must be very complicated. The fact is, however, the arrangement is so simple that the additional apparatus required to connect two multiplex circuits together hardly warrants the dignity of being called a repeater. All the accessories required are two short lengths of wire, as may be seen by a glance at the accompanying diagram, which represents two duplex circuits so connected at a repeating station. The polechanger and the polarized relay on the left we will assume comprise the Chicago set, and the similar apparatus on the right that of Boston.

The student will readily understand that if an operator manipulates the western polechanger in the usual way, that is to say, by means of the key, the operator in Chicago will hear the signals made. Hence any mechanical device that can control the polechanger should be able to perform the same kind of work as that done by hand.



of making them, in our large modern offices, is somewhat different. In other words, the arrangement of the local circuits is such that any two multiplex circuits may be quickly "repeated" together, or speedily disconnected as the occasion requires whenever there is a temporary or permanent demand for the same. In actual practice the connections are made at the loopswitch, to which board the local connections of all multiplex apparatus are extended and terminate in spring-jacks.

On the right and the left of the diagram are shown two springjacks which we will assume represent the local connections of the Chicago and the Boston polechangers and relays, respectively, extended to the loopswitch. The outer lip connects with the polechanger, or sending side, and the under lip with the relay, or receiving side of the multiplex apparatus. The connection be-

tween the two springjacks at the loopswitch is then made by means of a cord (also in the loop-switch) containing two insulated conductors each terminal of which ends in a wedge with two brass blades or faces. When the wedge on one end of this cord is inserted in the springjack connected with the Chicago apparatus, and the companion wedge on the other end of the cord in like manner inserted in the other or Boston springjack, those two multiplex circuits will be joined together in exactly the same manner as they are shown to be in the central portion of the diagram.

The advantage derived from the modern method, of course, lies in furnishing a quick means of repeating any two desired circuits together regardless of their geographical location in the operating department. The only alteration made in the connections of the multiplex apparatus after they have been hooked together is to shift the switch lever on one of the sets from the battery lead to a ground disc. That is to say, turn the lever to the right or left, as the case may require. The local battery from one set then furnishes the current for both sides, while the apparatus on the set where the lever was turned become simply "branch offices," assuming the polechanger and relay on that side are terminal stations in the same sense as the sounders at the end of a duplex loop in a broker office are terminals of the circuit.

The double conductor cords used in connecting two springjacks together are usually called "quad repeaters," not that they really are repeaters, but because they were first used principally to connect quadruplex and duplex apparatus together at the repeating station through the loopswitch board. By some these cords are called "run overs," "jumpers," "transfers," etc., according to one's fancy.

As the desk and loop local circuits of all multiplex apparatus are built up to a standard uniform value of resistance each conductor in the cord includes a lamp or other artificial resistance of like value inserted in series therewith in order to compensate for the loop resistance which is removed when the cord is substituted and the desk lever shifted to a dead ground. This is necessary in order to preserve the normal value of current in the local circuit after such connection has been made.

(To be continued.)

Recent Telegraph Patents.

A patent, No. 903,871, for electric telegraphy, has been granted to Isidor Kitsee, of Philadelphia. Means for impressing alternate positive and negative impulses of uniform duration on a cable, the intervals between impulses giving the code. Polarized syphon recorder used.

A patent, No. 904,157, for a combined telegraphic transmitter and typewriting machine, has been issued to Augustus G. Snyder, of Ilion, N. Y. A series of stationary contact pieces in an electric circuit

for transmitting signals, a series of keys, and means for mechanically connecting the reciprocatory pieces to the keys at will.

A patent, No. 904,367, for a relay for telegraphs, has been awarded to James Scotland, of Hearts Content, Newfoundland. Has a cylindrical armor and core, each slotted, to assist in demagnetization, and insulation separating core from armor.

A patent, No. 904,768, for a telegraph system, has been taken out by Stephen D. Field, of Stockbridge, Mass. Increases speed of signals on long lines by impressing a counter-electromotive force on the line, counter to line current when circuit is opened to form signals.

A patent, No. 904,936, for a telegraph repeater, has been obtained by Lewis B. Cecil, of Santa Barbara, Cal. Comprises a main line and branch relay, a repeating device in connection with each relay, a mechanical means in connection with each repeating device for locking the armature of the other relay in closed position, when the armature of the first relay is open.

A patent, No. 904,952, for a combination trolley and telegraph pole, has been granted to James Hackett, of Bellaire, Ohio. The trolley pole is enameled and made of stepped sections, which narrow toward the top of the pole.

A patent, No. 905,628, for a telegraphic repeating apparatus, has been awarded to W. E. Athearn, of New York. A circuit having at each of two stations a current reversing transmitter and a polarized relay, a single transmission circuit which controls the transmitter at one station and is itself controlled by the relay at the same station.

The following patents have expired:

Patent No. 463,852, for a synchronous telegraph, held by C. S. Bradley, of Yonkers, N. Y.

Patent, No. 464,001, for a telegraph repeater, held by R. L. Atkinson, of Delaware Township, N. J.

Business Notice.

Mr. Charles Selden, Jr., a lawyer, of 1342 New York avenue, Washington, D. C., who has had eleven years practice, offers his services as a patent attorney. It is a well-known fact that a good many inventors do not always have their interests looked after with that nice sense of discriminating care and attention that they have a right to expect from attorneys to whom they confide their cases. Frequently the inventor has need of advice, suggestive and technical in character, calculated to aid him in bridging over difficulties encountered possibly in design, and to reach the best results. This is what Mr. Selden is well able to perform, for associated with him in an advisory capacity is his father, Charles Selden, the superintendent of telegraph of the Baltimore and Ohio Railroad, a well-known telegrapher and electrician of prominence.

The Barclay Printing Telegraph System.

BY WILLIAM FINN.
(Part XIII.)

THE RECEIVING APPARATUS—CONTINUED.
THE PRINTER RELAY.

What is known as the "printer" relay is a polarized apparatus of the same resistance as, and in every other respect similar to the main line relay, portions of which were illustrated in Figs. 31 and 32 of the November 1 issue. Its adjustable parts are seen in Figs. 38 and 39, where P P represents a round brass plate having a circular groove c (Fig. 39) turned in its surface, the edges of the groove being undercut V-shape. A circular segment of brass, b, slides in this groove, and carries with it a block of ebonite, E, upon which are fixed the two contact

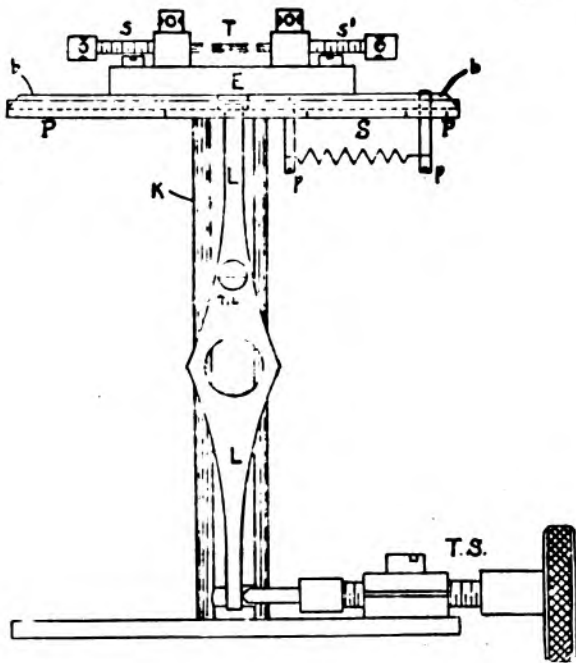


FIG. 38.—FRONT ELEVATION OF PRINTER RELAY, SHOWING ADJUSTABLE PARTS.

screws, s and s', between which the tongue, T, plays. By sliding the piece, b, round in the groove, c, it is evident that the position of the contact screws, s s', relative to the tongue, T, can be readily adjusted.

The movement of the sliding piece, b, is effected by the thumbscrew, TS, in the following manner: A pin, p (Fig. 38), is fixed to the sliding piece, and a second pin, p', is fastened to the stationary plate, P. A strong spiral spring, S, being hitched to these two pins, there is a tendency on the part of the sliding piece to be drawn round in the direction in which the hands of a watch turn. A brass lever, LL, approximately centered on the brass pillar, K, by the screw, m, has its upper end set loosely in a hole in the sliding piece, b, while its lower end banks against

the adjusting screw, TS, so that by screwing the latter in a forward, or "marking" direction, the upper end of L is moved to the right, causing the slider to move in a corresponding direction. When TS is unscrewed, the spiral spring, S, pulls

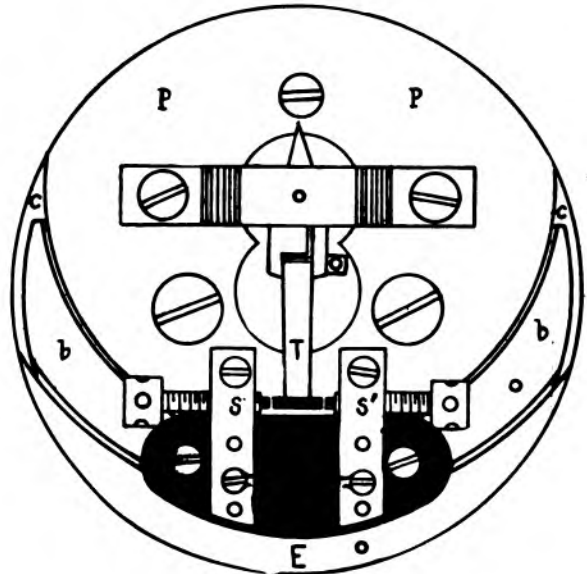


FIG. 39.—PRINTER RELAY: TOP VIEW OF FIGURE 38.

the sliding piece round in a reverse direction; thus the position of the contact screws can be finely adjusted.

The printer relay responds to current im-

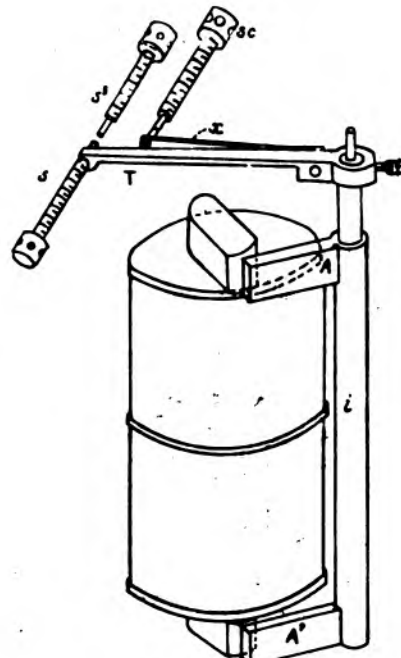


FIG. 40.—SEPARATOR RELAY.

pulses of every kind that come over the main line, and repeats them into the separator relay; and the escapement and synchronizing magnets of the sunflower. In order that it may operate to the best advantage, its armature tongue, T—

like that of the main line relay—should have a play between its limiting stops, *s s'*, approximately equal to one-sixty-fourth of an inch. The relay is first adjusted in the usual way by centering its armature lever so that it will remain

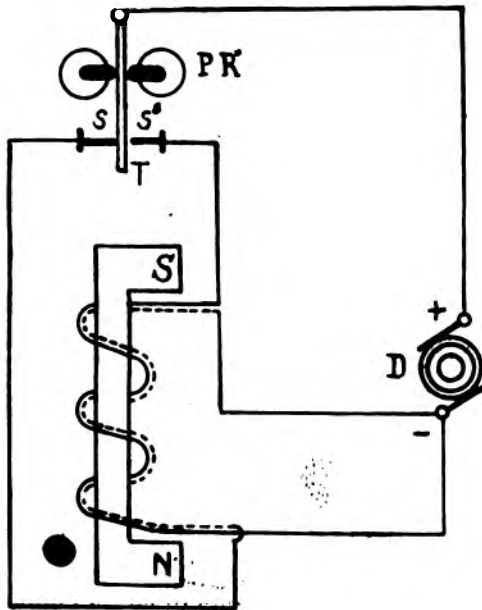


FIG. 41.—WINDINGS AND CONNECTIONS OF SEPARATOR RELAY TO OBVIATE EFFECTS OF RESIDUAL MAGNETISMS.

indifferently on either of its contact stops when placed there by the finger. This adjustment is usually made by means of the thumbscrew in the manner just indicated.

THE SEPARATOR RELAY.

The separator relay (Fig. 40), as its name implies, is an appliance employed in the printer sys-

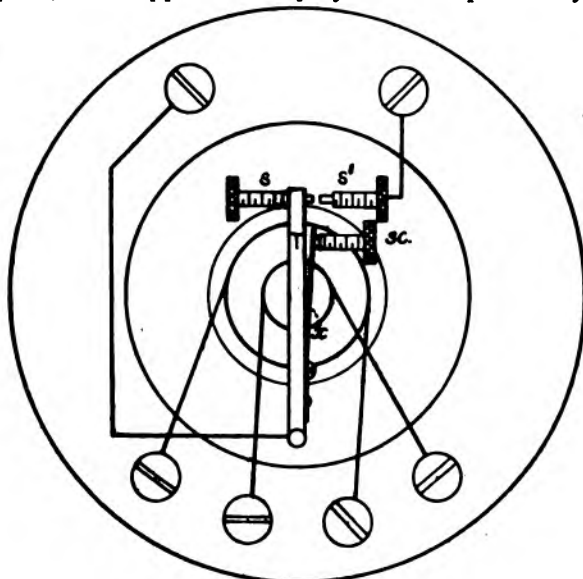


FIG. 42.—SEPARATOR RELAY PLAN OF WINDING.

tem for separating the impulses of long duration from the impulses of short duration, and permitting only those of the former variety to pass into, and operate such of the distributing relays as may be required for the purpose of

selecting a printer magnet. It is to all intents and purposes a common neutral relay, having a single soft iron core of the shape shown in Fig. 41, upon which are placed the two separate windings (shown also in Fig. 42) forming portions of the two branch circuits of which mention was made in the previous issue. The two windings, as will be seen, parallel each other along the entire length of the core (Fig. 41) and are so connected with the printer relay, *PR'* and dynamo, *D*, that when the tongue, *T*, vibrates between its stops, *s s'*, the current enters one winding from one side, and the other winding from the opposite side of the separator relay, thus changing the direction of flow through that instrument and reversing its magnetic polarity with every oscillation of the tongue, *T*. This arrangement tends to quicken the action of the relay, by wiping out the residual magnetism that would otherwise remain in the core at the end

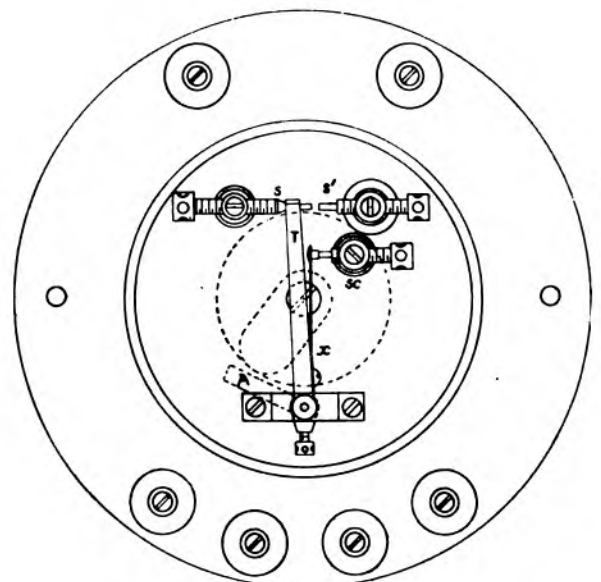


FIG. 43.—TOP VIEW OF SEPARATOR RELAY.

of each impulse, if the current were permitted to traverse each winding in the same direction.

In order to diminish the magnetic "reluctance" of this particular form of relay, the armature, *A A'* (Fig. 40), are connected together by a soft iron rod (*i*), through which the magnetic lines may complete their circuit and thus increase the magnetic pull for any given current value.

The spiral spring of the ordinary neutral relay is replaced in this instrument by a flat flexible retractile spring, *x*, the tension of which may be increased or diminished by means of the adjustable screw, *sc*. This spring is fastened to one side of the armature lever or tongue, *T*, the free end of which should have a play between its limiting stops, *s s'*, equal to about three-sixty-fourths of an inch. The tension of the spring, *x*, should be regulated with sufficient nicety to prevent the relay from being actuated by the reversals of the distant transmitter when the latter is running without slip at the working

speed, the adjustment being correct when there is just the least tendency on the part of the armature to vibrate under these conditions. An adjustment of this kind will admit of a certain amount of variation in the speed of the transmitter without detriment to the working; but any abnormal change in the rate of working would call for a fresh adjustment. For, it will be evident, that any considerable increase in the running of the transmitter would tend to shorten the dashes, which might not then be sufficiently prolonged to operate the relay, in which case the tension of the retractile spring would have to be reduced. If, on the other hand, the speed should be so lowered that the dots would have a tendency to become as long as dashes, the spring tension would have to be increased in order to make the relay insensible to them.

Under normal working conditions, as has been previously pointed out, the armature lever of this relay (a top view of which is illustrated in Fig. 43) should lightly rest against, or tend to vibrate upon its back stop, *s*, under current impulses of dot duration, and only make contact upon its front stop, *s'*, when the impulses of either polarity are of the required dash duration.

(To be continued.)

Personal.

Mrs. Brant, wife of the late John Brant, secretary of the Old Time Telegraphers' and Historical Association, is spending a few weeks at Mount Clemens, Mich., where she is taking the baths for the benefit of her health. Mrs. Brant expects to visit Europe in the spring, where she will spend several months in travel.

Mr. Donald McNicol, manager of the Postal Telegraph-Cable Company at Salt Lake City, an electrician of ability, whose writings on the subject of the telegraph, including that of wireless telegraphy, have been well received, recently delivered a very instructive lecture on wireless telegraphy before the Young Men's Christian Association of his city.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Executive officers who have recently been absent on business connected with the service include Charles C. Adams, vice-president, who visited Baltimore, Md.; Theodore L. Cuyler, Jr., assistant treasurer, who made a trip to Kansas City, Mo., and E. B. Pillsbury, general superintendent, who looked over a number of offices in the Eastern Division located in Pennsylvania.

Mr. C. F. Fox, superintendent at Des Moines, Iowa, having resigned, to take effect on January 1, the offices composing his district have been placed under the superintendency of A. B. Richards, whose headquarters are at Kansas City, Mo.

Mr. J. E. Rowe, well known in telegraph cir-

cles in Western Pennsylvania, has been appointed manager of the Titusville, Pa., office.

A Rowland printing telegraph duplex has been installed on the New York-Baltimore circuit. Rowland octoplex circuits are now in operation between New York and Boston and between New York and Philadelphia. Rowland equipment is also in use between New York and Chicago and Chicago and St. Louis, and will soon be installed between New York and Pittsburg.

PRESENTATION TO L. W. STORROR.

Leonard W. Storrer, the former general superintendent of the Postal Telegraph Cable Company, at San Francisco, was the recipient on November 21 of a beautiful gift tendered by former associates. It consisted of a diamond ring, valued at \$500, and a heavy silverplate, the latter bearing the inscription, "L. W. Storrer, from the Employees of the Pacific Division, Postal Telegraph-Cable Company, as a Token of Esteem and Affection, 1908." The presentation was made at Mr. Storrer's home at Berkeley, just across the bay from San Francisco, by a committee composed of Superintendent William Hearn, George W. Holt, manager of the San Francisco office, and by Miss Marie Casossa. Mr. Storrer while in office held a warm place in the respect and affection of the Postal forces on the Pacific Coast, and this testimonial was a concrete expression of that esteem, regret at his retirement from active duty and an assurance of continual attachment.

Augusta, Ga., Has a New Postal Office.

The Postal Telegraph-Cable Company occupied its new office at 765, 767 Broad street, Augusta, Ga., on November 29, removing thence from the corner of Broad and Jackson streets. The new offices of the company are as conveniently situated for the public as the old location, and everything in the building is new and the most modern in the way of telegraph equipment.

The office, in charge of Manager M. H. H. Duvall, is one of the largest the company operates in the Southern States, employing more than seventy-five people.

The business office is on the ground floor and is conveniently arranged and attractively fitted. Connection is had with the operating department, which is located on the second floor, by pneumatic tubes of the latest type, and by a private intercommunicating telephone system. The operating department, under the supervision of F. L. Wood, on the second floor, is fitted up in keeping with the business office, and every convenience is provided for the comfort of the employees and the rapid handling of business.

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Western Union Telegraph Company.

EXECUTIVE OFFICES.

Myron T. Wilbur, treasurer of the company, died at his residence in New York, on December 9. An obituary of Mr. Wilbur will be found elsewhere.

A. R. Brewer has been named acting treasurer of the company, and Lewis Dresdner has been appointed acting treasurer of the American District Telegraph Company of New Jersey.

Mr. E. B. Saylor, superintendent of Pittsburg, and who is the president of the Old Time Telegraphers' and Historical Association, was a recent visitor. He was accompanied by N. E. Church, manager of the office at Pittsburg.

A. L. Fish, of the electrical engineer's office, is on the Pacific Coast, where he is engaged in installing Barclay printers. The equipment will include the San Francisco-Los Angeles circuit, San Francisco-Portland circuit and San Francisco-Seattle circuit. Later a like circuit will be established between San Francisco and Chicago.

The supply department of the company, of which Horace E. Roberts is superintendent, and located at 152-154 Franklin street, New York, was completely destroyed by fire on December 8, entailing a heavy loss. Mr. Roberts was equal to the emergency, however, and within a few hours' time established new headquarters in the annex to this building at 14 Dey street, which he will probably occupy until a new structure can be erected on the Franklin street site.

This company has now about 5,000 money transfer offices. This branch of the service is being rapidly developed under the direction of William Holmes, superintendent of tariffs.

DEATH OF TREASURER WILBUR

Myron T. Wilbur, treasurer of the Western Union Telegraph Company, New York, died of diabetes on December 9, after an illness of two weeks. The announcement came as a great shock to Mr. Wilbur's official associates and friends. While it was known that he was not in the best of health of late, it was not supposed that he was seriously ill until within a few days of his demise. Mr. Wilbur attended the Carnegie dinner on November 27, and greeted his friends on that occasion with his accustomed cheerfulness and good nature.

Mr. Wilbur was a native of Walworth, N. Y., the date of his birth being October 16, 1849. He entered the service of the Western Union Telegraph Company at the instance of his uncle, the late Judge Palmer, as a clerk, on May 13, 1869. He was later promoted to be cashier of the company, and in 1881 was appointed assistant treasurer, succeeding to the treasurership on the death of R. H. Rochester, which occurred November 27, 1907. Mr. Wilbur was the treasurer of the Gold and Stock Telegraph Company, the Southern and Atlantic, the Pacific and Atlantic, the Franklin telegraph, Delaware River Tele-

graph Company, and about forty other subsidiary companies to the Western Union Telegraph Company. He was treasurer also of the American District Telegraph Company of New Jersey. The funeral services were held at his late residence in New York, 221 West One Hundred and Thirty-Sixth Street, on the evening of December 11, and were numerously attended, many of the officials of the company being present.

Statement of the Western Union Telegraph Company.

The Western Union Telegraph Company, on December 9, declared a quarterly dividend of three-quarters of one per cent., for the quarter ending December 1, 1908.

The following statement exhibits the condition of the company at the close of the quarter ended September 30, 1908:

Surplus July 1, 1908, as per last quarterly report	\$14,393,856.44
Net revenues, quarter ended September 30, 1908.....	1,864,954.97
	<hr/>
	\$16,258,811.41
From which appropriating for—	
Dividend of ¾ per cent.,	
paid October 15, 1908.....	\$497,820.50
Interest on bonded debt.....	433,062.50
	<hr/>
	930,883.00

Left surplus September 30, 1908... \$15,327,928.41

The following statement exhibits the estimated condition of the company at the close of the quarter ending December 31, 1908:

Surplus, September 30, 1908, as above	\$15,327,928.41
The net revenues of the quarter ending December 31, instant, based upon nearly completed returns for October, partial returns for November, and estimating the business for December, will be about	\$2,000,000.00
Less interest on bonded debt	433,062.50
	<hr/>
	\$1,566,937.50

Leaves estimated net earnings for the quarter, less interest on bonded debt

	\$1,566,937.50
	<hr/>
	\$16,894,865.91

It requires for a dividend of three-fourths of one per cent. on capital stock issued about

	746,822.02
	<hr/>

Deducting which, leaves a surplus, after paying dividend, of..... \$16,148,043.89

In view of the preceding statements, the com-

mittee recommends the adoption by the board of the following:

Resolved, That a dividend of three-fourths of one per cent. on the capital stock of this company be hereby declared payable on and after the 15th day of January next, to stockholders of record at the close of business on the 19th day of December, instant.

The net earnings of the September quarter are \$164,954 more than the estimate submitted at the September board meeting. The estimated net earnings for the quarter ending December 31, 1908, are \$1,566,937.50, or at the rate of 6.28 per cent. per annum. This estimate is \$1,196,057.03 more than the earnings for the corresponding quarter of last year, during part of which the strike prevailed, and \$45,000 more than the net earnings for the corresponding quarter of two years ago.

J. H. Dorsey, Postal Chief Operator at Los Angeles, California.

Jackson H. Dorsey, whose advancement to be chief operator of the Postal Telegraph-Cable



JACKSON H. DORSEY,
Chief Operator, Postal Telegraph-Cable Company,
Los Angeles, Calif.

Company at Los Angeles, Cal., was recorded in *Telegraph Age*, December 1, elevates to that position one who has made an exceedingly creditable record in that office. Mr. Dorsey was born at Litchfield, Mich., November 22, 1870. Learning to telegraph, his entry into the service was in the capacity of an operator in the employ of the Michigan Central Railroad, at Albion, that State, June 28, 1887. Here he remained for four years, subsequently serving Western Union interests as manager at various points in Michigan and Indiana. Going to Chicago he there became an operator for the Western Union Telegraph Company and afterwards for the Postal, making that city his home for several years. In 1902 he went to Los Angeles, entering the Postal service at that point. After six years of faithful service, during which time Mr. Dorsey pursued a careful course of study, he was promoted to be assistant

chief operator, an advance quickly followed by another, to that of chief operator, on November 1, last, succeeding Vail V. Stevenson, who was made manager.

The Cable.

The cable steamer Mackay-Bennett, Captain Fred H. Larnder, belonging to the Commercial Cable Company, is in the harbor of New York undergoing her annual survey. When this work is completed she will return to her station at Halifax, N. S.

Cable communication is interrupted December 14 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Macao	Aug. 29, 1908
Hayti	Nov. 23, 1908

Messages can be mailed from Hongkong, Private messages for the interior not accepted.

A New Edition of Maver's "American Telegraphy."

A new edition of Maver's "American Telegraphy and Encyclopedia of the Telegraph" is now ready for delivery. This will be known as the 1909 edition. The more important additions to the work at this time are descriptions of the Murray Printing Telegraph as now used in Europe, and of the Barclay Long Distance Printer, as operated on the lines of the Western Union Telegraph Company. This standard work on telegraphy now contains 668 pages and 492 diagrams. The new edition comes out in a new and distinguishing cover of dark green cloth. This book is a library on telegraphy in all its branches. It is used as a text-book in some of the largest universities in this country. It is written in plain English and practically without recourse to mathematics; hence it comes within the comprehension of the veriest beginner. No aspiring telegrapher can afford to be without it. This fine work will be sent to any address, carrying charges prepaid, on receipt of price, \$5.00, by J. B. Taltavall, *Telegraph Age*, 253 Broadway, New York.

Unveiling of an Ampere Tablet.

At Ampere, N. J., on December 3, the French Ambassador, M. Jules Jusserand, unveiled a tablet to the memory of his distinguished fellow countryman and townsman, Andre-Marie Ampere, the famous French physicist. The tablet is the gift of Dr. S. S. Wheeler, and is placed in the beautiful new railroad station at Ampere, built recently by the Delaware and Lackawanna Railroad Company. The tablet bears the following inscription:

"In honor of Andre-Marie Ampere, who founded the science of electro-dynamics, and whose name is used throughout the world to designate the unit of electric current."

Radio-Telegraphy.

In the recent French army maneuvers a wireless telegraph station in a balloon successfully intercepted messages sent from Berlin to vessels at sea.

A patent, No. 905,537, for a receiver arrangement for wireless telegraphy, has been granted to Gerhard Jahy, of Berlin, Germany. The antenna is not grounded, but is led through a coil of wire and connected with one pole of the coherer. The end of the coil at which the antenna enters into the interior of the coil is connected with the other pole of the coherer. The other end of the coil is grounded. Responds to very feeble waves.

Mr. S. S. Bogart, vice-president of the United Wireless Telegraph Company, New York, in a recent communication to *Telegraph Age*, writes: "We are constantly making additions to the list of marine and shore stations, and the power and range of communication of various stations is being increased from time to time. At present the company is operating twenty-two land stations on the Atlantic Coast, and eighteen on the Pacific Coast. In addition to these there are eighty-eight marine stations, maintained on sea-going vessels on the Atlantic Ocean, and twenty on the Pacific. We are now building and installing apparatus for the Dominican Republic, the Mexican Republic, and in Brazil on the Amazon River."

Father Joseph Murgas, of Wilkes Barre, who has invented an underground wireless telegraphy system, said a few days ago that plans had been perfected for establishing a service between that city and Binghamton. The underground stations consist of two tubes, thirty feet long, to be driven in the ground. One is of aluminum coated with silver and this is incased in a tube containing oil. Father Murgas says he will be able to send a wireless underground message from New York to San Francisco with only three repeating intermediate stations. He uses a Morse alphabet, but the dots and dashes are given by musical tones through finely adjusted sending and receiving instruments.

Radio-telegraphic communication with balloons has successfully been maintained in several instances recently, notably by the *Condor*, which rose from Brussels and exchanged signals with a station erected on the tower of the Palais de Justice, of Brussels., says an exchange. The aeronauts also easily overheard signals sent from the French military station on the Eiffel Tower. The possibility of such signals had long ago been established; danger was, however, feared from the sparks. The first person systematically to experiment in this line was Hergesell, who, while cruising on the ocean, sent up unmanned balloons from the ship. The balloons were fitted with

small receiving apparatus, tuned to different wave lengths on the different balloons, and the arrangement was such that the signal would open the valve of the respective balloon. Hergesell succeeded in bringing certain balloons down again at will at a distance of ten nautical miles.

The Wonders of Wireless.

Few people realize the growth and present extent of the wireless telegraph system in this country. Considering the tremendous obstacles to be overcome, the distances to be covered and the thousand and one hindrances, the expansion of the idea from the time the first company was formed in 1900 to the present date is nothing short of marvelous.

The first patent connected with wireless telegraphy was taken out in 1872 by Mahlon Loomis. Nothing was done with it, however, and it was not until 1886 that the subject was again taken up in the way of a patent. From that time to the present, many inventors have been working on the project.

To-day there are over fifty wireless stations on the coast lines of the United States which keep vessels at sea in constant communication with the land. The Government maintains practically as many at its coast stations, including nine stations in Alaska. The Government also has stations in Cuba and Porto Rico.

There are thirty-two steamship lines having vessels equipped with wireless apparatus and a majority of the United States battleships are so equipped. The Marconi system has about fifteen steamship lines with vessels plying between this country and Europe.

Apparently the possibilities of the wireless are unlimited. Even in its present somewhat crude state the results are almost beyond comprehension. The longest message on record without relay was sent last July when the American fleet was on its way from Honolulu to New Zealand. Admiral Sperry's flagship exchanged wireless messages from Point Loma, Cal., a distance of 2,900 miles.

The longest message with one relay was from Savannah, Ga., to the armored cruiser *Pennsylvania*, en route to Honolulu, a distance of 4,000 miles with a relay at Point Loma. The message traveled 2,070 miles over land and 1,930 over the sea.

It is said that a message can be flashed around the world in a minute and a half. But, consider the expense of wires and cables.

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The Telegraph Operator a Wanderer.

The telegraph operator is a wanderer by nature and by practice, remarked a correspondent recently. Ask any man you see pounding a key in New York if he is a native New Yorker, and nine times out of ten he was born in Kalamazoo, or Seattle, or Sioux City, or some other distant place.

There is usually a good demand for expert operators, so a man will give up a position in one city cheerfully and move on to another, feeling pretty certain that he'll land on his feet again. Take the thousands of men in this country who work for the Western Union or the Postal telegraph companies, for brokers, for newspapers, and for press associations, and you will find on inquiry that they have gridironed the United States and Canada, too, in their wanderings. Ask them why they are such a roving lot, and they will tell you they like to travel; that it's in their blood.

Perhaps one explanation for this roving spirit may be found in the genesis of the average telegraph operator. Most of them come originally from small towns. A boy of sixteen finds life in a small town irksome. He sees small opportunity for a start in life. Quite naturally he gets to know the one operator the place affords. In his idle moments, and they are many, he learns the code, and occasionally is allowed to sit in and send or receive easy messages. The day comes when the regular operator goes away to another town, and the youngster gets the place.

Now, given a young operator at his first job, and what do you find? For one thing, if he is good for anything at all, he will become proficient as soon as possible. He has to, for the man at the other end of the wire guys a novice unmercifully over every mistake. Then as he becomes proficient the young operator gets the desire to go elsewhere. It isn't ambition alone that prompts this move, although that enters in. He is in close constant touch with distant places. What more natural than that he should wish to go to those places and see for himself the things he has heard clicked off on the instrument.

So he begins to inquire of this and that man with whom he is in communication if there is a vacancy in sight. When he hears of an opening that looks good he applies for it at once by wire and maybe he gets his answer and the business is concluded in a short time. It is all so easy when it can be arranged by wire. The tests which most business men demand of men seeking employment don't call in his case for personal interviews. His proficiency may be tested at once on the wire.

Hence it comes that the young operator finds employment in a small city. But the wire calls him onward. He longs for the larger opportunity and the larger life of a big city. In a year or more he is in New York or Chicago or San Francisco. You might think that then he would settle down. But by that time he has acquired the fever of nomadism. He is just like the old tramp printer who is fast dying out, largely because of the increasing use of the typesetting machines.

The operator gets a few hundred dollars ahead and he quits on one pretense or another and moves on to some other place. After some years in the business he won't take the trouble to find out if there is a position ready for him where he is going. He takes the chance that he'll catch on somewhere.

There are about two things that will stop a telegrapher's wandering—marriage and the transition into some other line of work which demands that he stay in one place to succeed. If a telegraph operator marries his wife tends to restrict his wanderings. There have been some operators who continue to move about after marriage, but they are the exception. Comparatively speaking, only a small proportion of telegraphers marry, however, or at least marry early in life. The unattached ones, many of them, continue working their way from the Atlantic to the Pacific and back again, with diversions North and South.

When a telegrapher gets to be very proficient, is able to handle the Phillips code by which common words and phrases are reduced in sending to a few letters—has his own typewriter and can take matter at a rapid rate, he does not depend on the telegraph companies. He goes to work for a broker or a newspaper or a press association, which leases wires from the companies, and hires the operators. The pay is better and there is more opportunity to get into other lines of work.

So far these remarks have applied more particularly to what are known as commercial telegraphers. The operators who work for the railroads are classed separately.

Hundreds of men have got into newspaper work by way of the telegraph wire. Continual plugging away at press dispatches gives an operator a news sense and ability to write the English language. This is particularly true of the press associations. A knowledge of telegraphy is invaluable when it comes to disseminating the world's news almost as soon as it happens.

There is a certain lure about this trade which keeps many in it who have the opportunity but not the will or inclination to break away from it. The steady clicking of the sounder makes music which casts a spell. So the thousands keep on, while the hundreds quit, working and wandering with no fixed habitation or purpose in life.

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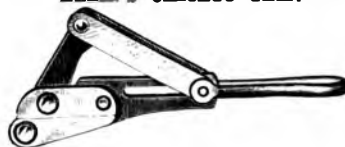
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Published fortnightly at 129 Pepys Road, London, S.E. Subscription, post-free, Five Shillings per annum. The TELEGRAPH CHRONICLE is the organ of the Postal Telegraph Clerks' Association, the most powerful organization of telegraphers in the world.

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Published on the 1st and 16th of every month.

TERMS OF SUBSCRIPTION.

One Copy, One Year, in the United States, Mexico,
Cuba, Porto Rico and the Philippine Islands . \$2.00
Canada 2.50
Other Foreign Countries 3.00

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DECEMBER 16, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientele. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

The Telegraph and the Interstate Commerce Commission.

President Roosevelt in his message to Congress places himself on record as favoring the putting of the telegraph as well as the telephone companies under the jurisdiction of the Interstate Commerce Commission. We must believe that the drift of modern thought in the domestic economy of our national progress and development is toward a larger governmental control of interstate business and traffic. It is natural perhaps that the common carrier interests should come under such jurisdiction. Nor can it be doubted that, generically speaking, such cognizance of public affairs by the government is wise, for it serves to keep within proper and legitimate bounds the conduct and operation of interests that in their magnitude, far reaching service and influence have become and are becoming

strong and impressive powers within their individual scope. So it is that sooner or later the exercise of governmental control affecting in some measure at least all vast business undertakings is bound to gain a wider recognition in this country. It is inevitable apparently in the case of the telegraph. Manifestly the telegraph cannot, and logically will not, resist the adoption of a law of control nor claim exemption for its workings. And when such a law is created and a commission shall sit in arbitration, the telegraph will accept with good grace conditions as will then come into existence. All this perhaps goes without saying. This attitude should be obvious to all right thinking persons, and no need exists to pass any criticism on the position occupied by the telegraph in relation to this question.

On general principles, then, accepting the proposition of a widening of the functions of the Interstate Commerce Commission, it is questionable whether any betterment in the service or in the administration of telegraph affairs would follow as the result of the introduction of any external authority. The problems of management with which the telegraph companies are contending, constantly growing in intricacy, are many and varied, and only trained minds can be entrusted with their determination. In any event, if at all, the national government should be the sole outside regulating factor in telegraphic affairs, local commissions and laws of individual states, varying as they do in perception and purpose, too frequently meddlesome and irrelevant in character, as a rule creating antagonisms instead of promoting interests, which should be mutual in character, should be abrogated in favor of the higher tribunal of the government. The aim of the telegraph, like that of the railroads, is to serve the needs of the people at large without regard to the narrowing limits of state boundary lines, and in this purpose stumbling blocks should not be placed in their way, as is too frequently the case.

This country owes much to the telegraph. The inventor of the telegraph, from which he realized a fortune, as fortunes then went, and very properly so, was a man of high principle. Those who have followed him in the development and expansion of his invention, who successively have extended its use throughout not only the United States, but throughout the world, providing by its means the further enlightenment and civilization of mankind, have been men of probity, energy and, if you please, and necessarily so, men of capital—grand, let it be emphasized and remembered in their capacity for doing things. The men of to-day who are entrusted with the control of telegraph affairs are worthy successors of those who have gone before them. They are conducting the telegraph with ability and with honesty.

There may be graft, unholy combinations and commercial immorality extant in the business

world, a check to which and its overthrow is demanded, but because this is so it does not follow that an entire moral collapse of the business interests of this country either exists or is impending, a thought that a reading of the full context of the President's message might easily convey, thus making it necessary for a more extended application of the idea of the Interstate Commerce Commission. The world is better to-day than it ever was before; honesty and integrity of purpose are dominant characteristics in the average business man, no matter what we may be told to the contrary. This is reflected in the gigantic, intense and strengthening fabric of commerce that binds men together, and which would be rent asunder if moral unsoundness in commercial matters were lacking. It is further observed in the growth of eleemosynary institutions physical expressions of human charity and kindness and good will towards others. But we do not desire to preach a sermon, only to illustrate a great truth. It ill becomes one in high authority to shake a mailed fist in the face of the business community. Our prosperity rests largely with our business men who do not offer "an ignorant resistance to every effort for the reform of abuses and for the readjustment of society to modern industrial conditions." Their demands are only for a fair and equitable consideration.

Mr. Carnegie's Honor Pensions.

SOCIETY OF THE UNITED STATES MILITARY TELEGRAPH CORPS.

Office of the Secretary,
658 Broadway, New York,
December 16, 1908.

Editor TELEGRAPH AGE:

Your readers generally, and the surviving members of the United States Military Telegraph Corps in particular, will be interested to know that Mr. Andrew Carnegie has extended the conditions of his "Honor Pension" of \$12 per month, as specified in his letter of December 16, 1907, a copy of which was published in TELEGRAPH AGE of January 16, 1908, so as to include the widows of members of the corps who were married to such members prior to December 16, 1907, and who were living with their husbands at the time of their death and who have not since remarried. It is not intended that this grant shall apply to widows of members who died prior to the date above specified, nor, if any such there be, who may have married a member since that date. Application blanks will be furnished on request.

These honor pensions under the terms of Mr. Carnegie's letter above specified, are to continue only until Congress shall have passed the necessary measure which will give the members of our corps a pensionable status.

It will save the time of the executive committee if applicants for the Carnegie pension will in every case first see that a certificate of honor-

able service under the Act of Congress of January 26, 1897, has been issued by the Secretary of War.

The payment of these pensions to widows and also to surviving members whose claims shall have received or may receive the approval of the executive committee, will be made monthly, that is, \$12 per month, instead of the yearly sum of \$144.

The monthly payment of \$12 in case of those whose claims have already been approved and whose checks have been issued for the yearly amount, will begin on the expiration of twelve months from the date of the yearly payment.

DAVID HOMER BATES
Secretary.

A New United States Military Telegraph Corps Bill in the House.

The Hon. Jacob Van Vechten Olcott, of New York, introduced on December 7 in the House of Representatives the following bill, No. 22275, which was referred to the Committee on Military Affairs, with instructions to print, and which was entitled "A bill for the relief of war telegraphers":

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the Secretary of War is hereby authorized and directed to issue certificates of honorable discharge from the United States Army to all persons who have received or who shall receive from the Secretary of War certificates of honorable service in the United States Military Telegraph Corps.

Senator Chauncey M. Depew, of New York, has written to several of his constituents, who are military telegraph operators, that he is heartily in favor of their claims as indicated in the printed petition, thousands of which have been forwarded to Congress with about 50,000 signatures coming from forty States in which the survivors of the Corps now reside.

Proceedings of the Reunion of the Old Time Telegraphers' and Historical Association.

Mr. F. J. Scherrer, of New York, the secretary of the Old Time Telegraphers' and Historical Association, has brought out the published proceedings of the twenty-seventh annual session of that organization, held at Niagara Falls, N. Y., on September 16, 17 and 18, 1908. This initial work of the new secretary, which makes its appearance in good time, is exceedingly well done, the subject matter receives thorough and careful treatment, the details of the meeting being fully reported, all of which goes to show industry and painstaking care in the compilation. The illustrations are numerous, the presswork excellent, the paper used being of a fine, heavy quality, making the printed page of text and illustrations unusually attractive and clear. Altogether the work measures well up to the best of the kind that has preceded it, and the members of the association will welcome its receipt as affording a concrete reflex of one of the most delightful reunions of the long series.

Echoes of the "73" Carnegie Dinner.

The "73" birthday dinner given by telegraphers to Andrew Carnegie in New York, on November 21, has become a delightful memory. Pleasant remarks spoken in retrospect of the event are heard on all sides, for the graciousness of the affair, viewed both in the spirit of its tender and in its receipt, is acknowledged everywhere.

Among those invited to be present, and to occupy a seat at the guest's table, was Orrin S. Wood, the veteran telegrapher, the oldest living operator in the world, who reached his ninety-first birthday on December 14. While hoping to attend he was unavoidably absent, his condition of health at just this time making it inadvisable for him to go out. On the day following the dinner, David Homer Bates, chairman of the committee of arrangements, and secretary of the Society of the United States Military Telegraph Corps, wrote to Mr. Wood as follows:

Your note of yesterday and the one to Colonel Clowry duly received, and the order for your carriage, of course, countermanded, but with sincere regret.

It would have been worth while to have had with us last evening the operator who learned to telegraph in 1844 on the first telegraph line built and which was completed in that year.

We had one hundred and twelve guests, all of whom, with but few exceptions, had been at one time telegraph operators, including our honored guests, Mr. Carnegie and Mr. Edison.

Mr. Carnegie was in fine form and spirit and the dinner was a home-like, enjoyable affair, no highfaluten speeches from noted orators or after-dinner speakers, but just a family reunion. Every one entered into the enjoyment of the occasion and none more so than A. C. himself.

We were very sorry indeed not to have had you and your compeer, General Thomas T. Eckert, with us.

73 to both of you.

In our extended report of the occasion, published in the December 1 issue, the full text of the speeches delivered by Colonel A. B. Chandler, of New York, and of Richard O'Brien, of Scranton, Pa., did not appear. These are now given. Colonel Chandler said:

For a little more than fifty years I have rejoiced in the fact that I chose telegraphy for my life occupation, and during all those years I have pursued it in its various departments, with keen interest and without interruption. I have watched its growth and development closely and with great satisfaction.

Many of the very able and very useful men of our own and of other countries have grown up from their service as telegraph operators. One of these is the honored guest of this occasion, and no other one of them has attained such measure of commercial success as has been achieved by him. But the distinguishing merit of his career, as it seems to me, consists in the beneficent use which he has made of the fruit of his efforts—covering an extent of help for the education and uplift of the human race that is unmatched by the accomplishment of any other single individual in the history of the whole world.

Our fraternal signal of good wishes—"73"—has always had a charm for us that others than telegraph operators can hardly appreciate. But from this time forward, its significance will be especially emphasized by its application at this time in invoking blessings upon one who was once of our number, and who has now become seventy-three years young.

Here is what Mr. O'Brien said:

When I was very young I thought I could talk, but Mr. Carnegie cured me of that conceit.

Thomas A. Scott was then superintendent of the Penn-

sylvania Railroad at Altoona. Andrew Carnegie was his assistant. Tom Carnegie and John Pitcairn were the day operators and I was the night operator.

One day Tom Carnegie and I went trout fishing to a mountain stream near Altoona. Tom took along a valuable spaniel belonging to his sister. We fished all day and when we were about to return the dog attacked a large rattle-snake and was bitten on the shoulder. We managed to kill the snake, but the dog suffered greatly and was soon unable to walk, and although he was pretty heavy, we carried him home about two miles.

We were dead tired that night, and in spite of all I could do my head went down on the table more than once. I fear I did not get all that was passing on the wire. About midnight there was a freight wreck on the road. Fortunately I was not responsible, but I thought I knew who was, and in the morning, finding that another was charged with the accident, I spoke up rather freely in his defense.

That afternoon I was called into Mr. Carnegie's office and asked if I had made such a statement. I replied that I had. By this time Mr. Carnegie had all the facts before him and it did not take him long to show me that I was entirely wrong. He then said: "Richard, if you want to succeed in this business you must learn to keep your mouth shut and always remember that a close mouth is a sign of a wise head." I have never forgotten that lesson and have ever since been learning how to do it. It is now too late to change the plan.

I might add, however, that Mr. Carnegie did not lay that incident up against me. When the Civil War broke out he was appointed assistant general manager of government railroads and telegraphs, and in response to a telegram from him I went to Washington in company with three of the brightest and best telegraph boys on the Pennsylvania Railroad. Among whom was my friend David Homer Bates.

We arrived in Washington April 25, 1861, and I reported to Mr. Carnegie at the Baltimore and Ohio Railroad depot. I found he had been working three day and night getting the road and trains in a safe running order. He set me to work and stood over me almost continuously day and night rushing troop trains into Washington until there were soldiers enough to safeguard the capitol.

Later he gave me one of the greatest pleasures I have ever had in life by securing for me the appointment of chief operator at headquarters Department Virginia and North Carolina, at Fortress Monroe. This took me to the front, where I wanted to go, and where General Eckert kept me throughout the war, giving me the free hand and strong backing which enabled me to do my share toward proving for the first time in history that the electric telegraph is invaluable in war, and that it very materially aided in the preservation of the Union.

I was with them at the front and on the battlefields of Virginia and North Carolina from the first to the close of the war, and I can truthfully say I do not believe the world has ever produced a braver, more faithful or more efficient body of men than the boys of the United States Military Telegraph Corps, of which Mr. Carnegie was the father.

Experiments are being made in Europe with telegraph poles made of glass. They will not rot of course, nor can they be destroyed by lightning or bugs. It is thought that some way will be found to keep them from breaking easily. If the average small boy of Europe is like his American cousin it will be quite a stunt to find a way to keep them from breaking easily.

Telegraph Age constitutes a "school of instruction" to every would-be telegrapher. It is accurate and authoritative and worth many times the price of subscription (\$2.00) to any who would inform themselves respecting the telegraph.

A Notable Decision Affecting the Liability of the Telegraph.

A decision was reached by the Court of Appeals of the State of New York, on November 10, in the case of Gilbert C. Halsted and Nettie M. Halsted, appellants, vs. the Postal Telegraph-Cable Company, respondent, which in its finding is of immense importance to telegraph interests. The questions of negligence and of the regulation of liability for errors by contract came up for review.

A résumé of the decision may be summarized as follows:

A mere error by a telegraph company in the transmission of a telegram will not, in the absence of any evidence of wilful misconduct on its part, warrant a jury in finding it guilty of gross negligence.

Where one requests another to send to him by telegraph the price at which he will furnish a certain article, and, pursuant to such request, a telegram is sent, but by error in transmission a wrong price is given, resulting in loss to the addressee, the latter is bound, with respect to any claim against the company for such loss by the contract made between the sender, as its agent, and the company, printed on the back of the telegram blank, to the effect that the company would only be liable for mistakes when the telegram was repeated.

A telegraph company may protect itself by contract and by reasonable regulations against liability for errors caused by the hazards of the business or the negligence of its servants, if not gross.

The plaintiffs brought this action to recover from the defendant the damage occasioned to them by the alleged negligence of the latter in erroneously transmitting to them a telegraphic message. The plaintiffs, being manufacturers of beef bags, in the City of New York, received from Armour and Company, of Chicago, a letter asking the lowest "price on 25,000 sets of bags," and they replied that they would telegraph them a price at a later time. The plaintiffs then requested the Cannon Manufacturing Company, of Concord, North Carolina, as they allege, "to send them by wire the price for 200,000 yards each of the narrow and wide light beef cotton goods." On July 27, 1903, they received through the defendant a telegram from Concord, addressed to them, which read: "Delivered commencing about August fifteenth, light narrow two eighth wide three eighth net," and was signed "Cannon Mfg. Co." Thereupon and on the same day, the plaintiffs telegraphed and wrote to Armour and Company a price, which was based on the quotations of the Cannon Manufacturing Company as they were given in the telegram. Armour and Company the same day telegraphed in reply an order for the bags and the order was entered by the plaintiffs. On July 28 plaintiffs ordered by telegram from the Cannon Manufacturing Company 175,000 yards of the narrow and 150,000 yards of the wide cloth, and at the same time wrote a letter to the company confirming the telegram. On July 29 plaintiffs received a letter from the Cannon Manufacturing Company inclosing a copy of the telegram which it had delivered to the defendant, and it then appeared that the message should have read: "Deliveries commencing

about August fifteenth light narrow two eighth wide three eighth net." The difference between the telegraphic message as delivered to the defendant at Concord and as it was received by the plaintiffs at New York was that the word "deliveries" had become changed to "delivered" and that the two words "eighth" had become "eighth." It was shown that these quotations, which might not be very intelligible to the ordinary person, are well understood in the trade. The mistake made in the transmission of the quotations affected the contract made by the plaintiffs with the Armour company and caused a loss to them in the transaction. The plaintiffs endeavored to secure a cancellation of the contract with the Armour company by reason of the mistake in the telegram from the Cannon Manufacturing Company upon which it had been based, but they were unsuccessful. The Cannon Manufacturing Company refused to assume the liability for the mistake. The damages demanded in the complaint were in the amount of the loss to the plaintiffs on the Armour contract. The telegram from the Cannon Manufacturing Company was written upon one of defendant's blank forms, which read: "Send the following message subject to the terms on back hereof, which are hereby agreed to." That was followed by the plaintiffs' address, the quotations of prices and the signature of the Cannon Manufacturing Company. Below were the words: "Read the notice and agreement on back." One of the terms of the agreement referred to reads as follows: "To guard against mistakes or delays the sender of a message should order it repeated; that is, telegraphed back to the originating office for comparison. For this one-half the regular rate is charged in addition. It is agreed between the sender of the following message and this company that said company shall not be liable for mistakes or delays in the transmission or delivery or for non-delivery of any unrepeatable message beyond the amount received for sending the same." There was also a stipulation limiting the liability of the telegraph company in the case of a repeated message unless specially insured in accordance with a provision for such insurance.

The defense of the defendant, beyond a denial of the negligence alleged with respect to the transmission of the telegram from Concord, was based upon the terms of the contract between it and the sender of the message. There was no evidence of negligence in the transmission of the message, other than in the changes made in the message between its delivery to the defendant and its receipt by the plaintiffs. There was evidence that atmospheric and electrical conditions and disturbances might affect the accurate transmission of a telegraph message; although the possibility of such changes being caused thereby in the symbols, or signals, as were affected in this case, was somewhat in dispute upon the evidence of the experts.

Motions of the defendant to dismiss the action at the close of the plaintiffs' case and at the close of the whole case were denied, and the trial court submitted to the jury the question whether the defendant was guilty of gross negligence in the performance of its undertaking. The court, upon a request of the defendant further to instruct the jury that "the terms and conditions on the blank * * * are reasonable and valid and constitute a contract between the parties," ruled that they were reasonable and valid and constituted a contract between the company and the sender, "but not with the plaintiffs." To which ruling the plaintiffs excepted. A verdict was rendered for the plaintiffs for the amount claimed. Upon appeal to the Appellate Division, that court, by a divided vote of the justices, upon questions of law only, reversed the judgment which the plaintiffs had recovered and granted a new trial. The plaintiffs have appealed to this court from the order of reversal.

The decision of the court was delivered by Judge Gray as follows:

It is the plaintiffs' claim that the defendant is liable to them, as the addressees of the telegraphic message, for the failure to properly perform its duty, from which liability it was not relieved by the terms of its contract with the sender of the message. The argument is made that the defendant, as a public service corporation, "owes a duty to the public, for the breach of which a party injured has a right of action which is unaffected by any contract of limitation to which the injured person is not a party," notwithstanding the duty was undertaken by reason of such contract. So far as the plaintiffs' claim was predicated upon the alleged gross negligence of the defendant in the performance of the undertaking to transmit to them the telegraphic message from the sender in North Carolina, it is sufficient to say that the evidence wholly failed to make out any case for the jury on that theory. It showed simply the commission of an error, which, so far as material in its consequences, occurred in the change of the word "eighty" to "eighth." The letter "y" was changed to the letter "h" in two instances. Whether such changes were the inadvertent or mistaken act of the receiving operator or of any operator at the relay station or whether they were the result of atmospheric disturbances or of perturbances of the electrical fluid to which, concededly, the transmission of telegraphic messages is more or less subject, is not material. The nature of the undertaking by a telegraph company suggests the possibility, if not the probability, of peculiar risks affecting it, whether in the one or the other way. However occurring, if by no willful misconduct, a mere mistake or error in the transmission of a message would not warrant a jury in finding that there had been more than ordinary negligence (see *Breese v. U. S. Tel. Co.*, 48 N. Y., 132; *Primrose v. Tel. Co.*, 154 U. S., 1). The hazards attending upon the accurate performance by telegraph corporations of their function of transmitting messages are obvious, and the prudential character of such regulations as this defendant had adopted in order to guard against inaccuracy in transmission and to prevent mistakes from any cause is evident. The importance of accuracy to the parties cannot always be apparent to the operator, but it is to the sender. Where the wording of a message is such as to be obscure in its meaning or unintelligible to the ordinary reader mistakes are reasonably possible in the transcribing. In any case, the regulations of the telegraph company afford the means of making accuracy reasonably certain or of effecting insurance against mistakes.

The question in this case must be, what legal relation did the defendant sustain to the plaintiffs, or what was the measure of the duty owing by the defendant and of its re-

sponsibility for a failure in performance? Was the duty an absolute one, as claimed by the appellants, or was the undertaking one within the terms of the contract with the sender? In my opinion the contract was binding upon the appellants and relieved the defendant of any liability beyond that stipulated for.

In the Appellate Division it was held by a majority of the learned justices, in effect, that the defendant had the right to make the regulations which prescribed its liability in accepting messages for transmission, and that "whether the action is deemed to rest upon the contract of the sender or to result from a breach of duty, the limitation of the amount of damages to be recovered being reasonable, the plaintiff has no standing to maintain this action unless he is the real principal in the action, and then only to the extent of the amount paid for the transmission of the message." The dissenting justices took the view that as the contract of the defendant with respect to its liability was only with the sender of the message, the plaintiffs, as the receivers, were not bound by it, and that their action rested on a negligent breach of the duty owing by the defendant to deliver the message as received. It was said that "telegraph companies, being under a public duty to receivers of messages, senders of messages cannot by contract lessen or do away with that duty. They may only do so in respect of the duty due to themselves."

For the decision of this case it is unnecessary that the court should go as far as did the Appellate Division in the prevailing opinion in defining the general responsibility of the defendant towards the addressee of a message. It was alleged in this complaint that the "plaintiffs requested the Cannon Manufacturing Company * * * to send them *by wire* the prices" for the goods, and such was shown to be the fact by the evidence of the plaintiffs. The Cannon Manufacturing Company, therefore, in transmitting the information requested by means of the telegraph, was made the agent of the plaintiffs for that purpose. The plaintiffs, not desiring to await a communication from the Cannon company in the ordinary way of a letter, availed themselves of the latter's services and authorized them to employ the telegraph system for sending a reply. In doing so the sender was either the plaintiffs' agent in making the contract with the defendant or it made the contract for their benefit. While in either view the result would be the same, in so far that the plaintiffs would come under the obligation of the contract with the defendant, it is probably the more correct view that the Cannon Manufacturing Company acted as the agent of the plaintiffs in contracting for the conveyance of its message by a telegraph line. If that be true, the plaintiffs must be concluded by the act of their agent. The Cannon Manufacturing Company had a reasonable latitude of action in entering into such a contract, and that the terms of the contract as made were reasonable must be regarded as settled upon authority.

The defendant, while it may be likened to a common carrier in its occupation of conveying messages from and to all persons, unlike a common carrier of goods, does not become an insurer in their transmission. Its duties are performed in a different way. The reasons for making common carriers of goods insurers of their value do not apply in the case of telegraph systems, for there is no custody of goods, and the conveyance of messages is subject to the contingencies of extraneous disturbances beyond the control of the telegraph owner, or to the fallibility of operators in transcribing by signals, or symbols, or in comprehending the message itself as written. By reason of the franchises and powers accorded to it, a telegraph corporation performs public functions and it comes under that general obligation to which all quasi-public corporations are subject to conduct its corporate business, and to discharge the duties incident thereto with reasonable diligence and with a due care for the rights and interests of those concerned in the corporate operations. But, however strictly held to this general obligation, it is competent for it to make such rules and to prescribe such regulations for the conduct of its business as are reasonable. It is entitled to protect itself against the incidental hazards of operation and, by contract, to limit its liability for mistakes,

or delays, or non-delivery, caused by the negligence of its servants, if not gross (*Breese v. U. S. Tel. Co.*, 48 N. Y., 132; *Young v. W. U. Tel. Co.*, 65 ib., 163; *Kiley v. W. U. Tel. Co.*, 109 ib., 231; *Pearsall v. W. U. Tel. Co.*, 124 ib., 256-267; *Primrose v. W. U. Tel. Co.*, 154 U. S., 1-15). In each of the cases cited, the contract with the telegraph company was upon printed blanks, similar to the one which the sender of the message in question made use of. In the *Pearsall* case (*supra*) the question passed upon was whether the sender of a message was chargeable with constructive notice of resolutions of the defendant limiting its liability for an unrepeatable message. While holding that mere notice was ineffectual to limit the liability for a failure to accurately transmit—and upon that there was a sharp division in the court—the right of a telegraph company to contract for such limitation was considered to be settled. The stipulations upon these blanks have invariably been held in this State (New York) to be reasonable, as they have been by the United States Supreme Court, and in many of the states. The decision in the case of *Ellis v. Amer. Tel. Co.* (95 Mass., 226), largely quoted from in the prevailing opinion below, turned upon the general right of the receiver of a telegraphic message to hold a telegraph company responsible for the damage resulting from material errors occurring in the transmission of the message. In that case, as in this, there was an error in the quotation of a price. The Massachusetts Supreme Court held that the liability of the telegraph company to the receiver of the message was generally limited by the contract upon the blank to the amount received by the company from the sender, where the message had not been repeated. It was held there, in effect, that the regulation adopted by the telegraph company for the repetition of a message, in order to guard against mistakes, was a most reasonable requisition, and that, notwithstanding the receiver had entered into an express contract with the company, and could not be held to have made any express stipulations with it, he could not claim any higher or different degree of diligence than was stipulated for between the sender of the message and the telegraph company. This case was cited with approval as to the general rule in *Pearsall v. W. U. Tel. Co.* (124 N. Y., at p. 270). If it were necessary in this case to determine the measure of liability of the defendant generally to the receiver of a message for the loss occasioned by some mistake or error in its transmission, my personal judgment would incline me to agree with the view of the Massachusetts court. The English courts have refused to recognize a right of action in the addressee of a telegraphic message for a failure to accurately transmit it for want of any privity of contract (*Dickson v. Reuter Tel. Co.*, 2 C. P. Div., 62), and, while that right is accorded here for negligence in performing a duty, I fail to perceive any sufficient reason why, in a case of failure not due to gross negligence, the telegraph company should be held to a higher degree of diligence and care than was stipulated for with the sender. But the facts of this case do not make it necessary to go so far, and our decision is limited to those facts. It is our judgment that where the receiver of a message has, by a special request, procured it to be sent by the telegraph, he becomes bound by any reasonable contract made by the sender with the telegraph company for its transmission and is limited in his claim for any damages for a loss occasioned by error or mistake in transmission, where the stipulations for the repetition or for the insurance of the message have not been availed of, to the amount stipulated in the contract.

In the two cases in this court to which our attention is directed by the appellants nothing in their decision authorizes or even points to a different view of the question. In the case of *Ellwood v. W. U. Tel. Co.* (45 N. Y., 549) the action was brought by the receiver of the message and the defendant was shown to have been guilty of gross negligence. There was no error or mistake in the message transmitted, but the fault of the telegraph company was in delivering a message purporting to be from the cashier of a bank when it was known by the operator that that officer had

not signed the telegraphic message. The telegram directed the payment of money to a person named, and when first transmitted the message was signed simply in the name of the bank. The plaintiffs, to whom the message was addressed, called the attention of the telegraph company to the fact that the name of the officer of the bank was wanting. It was sent back for repetition, and, as repeated, bore the name of the cashier. It was shown that the operator knew that both messages were written by a person who was not the cashier of the bank and who was known by the same name as that of the person to whom the telegram authorized the payment of the money. In the case of *Lowery v. W. U. Tel. Co.* (60 N. Y., 198) the plaintiff was the receiver of a message and sued the defendant for a loss occasioned by reason of a change in the figures of a sum of money which the sender asked of him. Upon receiving a larger sum from the plaintiff the sender of the telegram misappropriated it and absconded. The plaintiff recovered a judgment for his loss, which eventually was reversed in this court, upon the ground that the defendant's negligence was not the natural and proximate cause of the loss sustained by the plaintiff, as the embezzlement did not naturally result from the wrong of the defendant. The terms of the sending do not appear in the report of the case, and no reference is made to the subject. The appellants' reference to the printed record shows a contract governed by the law of Illinois, according to the determination made below, which differed from the law in this state. The case is of no authority upon the determination of the question in this case.

The contention of the appellants that the printed blank was insufficient to limit the defendant's liability for negligence is quite untenable. It was not necessary that the word "negligence" should be used in the stipulations of the contract. It was a sufficient protection to the defendant that the contract required a repetition of the message, or an insurance, in order to make the defendant liable for mistakes or delays in the transmission or delivery beyond the amount received for sending the same. Such mistakes or delays, whether caused by the negligence of the defendant's servants, if not gross, as by willful misconduct or by causes beyond its control, were covered sufficiently by the clause of the contract.

I think that the plaintiffs failed to make any case against the defendant for the recovery of the damage claimed to have resulted to them by reason of the error or mistake in the message, as transmitted, and the trial court was in error in submitting the case to the jury upon the theory that the stipulations on the printed blank upon which the message was sent were not binding upon the plaintiffs. For the reasons given I advise the affirmation of the order of reversal, and that judgment absolute should be rendered against the appellants, pursuant to the stipulation in their notice of appeal, with costs to the respondent in all the courts.

CULLEN, Ch. J.; VANN, WERNER, WILLARD BARILET, HISCOCK AND CHASE, JJ., concur.

Ordered accordingly.

"Sketches Old and New," by Walter P. Phillips, is a handsomely bound volume of 164 pages of interesting and charmingly told telegraph stories; one of the very best works of the kind ever published, and which will appeal strongly to every telegrapher; price, \$1.

Every telegrapher who loves his profession, who is determined to master its technicalities, and thus insure for himself the confidence and respect of his official superiors and place himself in the direct line of promotion, should subscribe for and become a careful reader of *Telegraph Age*.

Professor Bell's Prophecies Respecting the Telephone.

If someone should tell you that, thirty years ago, before such a thing as a central office was in existence, a definite prediction regarding the development of the telephone foretold not merely central offices, but aerial and underground cable, multiple cable distribution, toll service, private branch exchanges for hotels and offices, speaking tube installations, free trial service and measured service, probably you would doubt the assertion and demand proof. Yet such predictions appear in the following letter written by Professor Bell. Professor Morse made similar prophetic predictions regarding the telegraph. Professor Bell's letter is as follows:

Keensington, March 25, 1878.

To the Capitalists of the Electric Telephone Company:

Gentlemen:—It has been suggested that at this, our first meeting, I should lay before you a few ideas concerning the future of the electric telephone, together with any suggestions that occur to me in regard to the best mode of introducing the instrument to the public.

The telephone may be briefly described as an electrical contrivance for reproducing in distant places the tones and articulations of a speaker's voice, so that conversation can be carried on by word of mouth, between persons in different rooms, in different streets or in different towns.

The great advantage it possesses over every other form of electrical apparatus consists in the fact that it requires no skill to operate the instrument. All other telegraphic machines produce signals which require to be translated by experts, and such instruments are therefore extremely limited in their application, but the telephone actually speaks, and for this reason it can be utilized for nearly every purpose for which speech is employed.

The chief obstacle to the universal use of electricity as a means of communication between distant points has been the skill required to operate telegraphic instruments. The invention of automatic printing, telegraphic dial instruments, etc., has materially reduced the amount of skill required, but has introduced a new element of difficulty in the shape of increased expense. Simplicity of operation has been obtained by complication of the parts of the machine—so that such instruments are much more expensive than those usually employed by skilled electricians. The simple and inexpensive nature of the telephone, on the other hand, renders it possible to connect every man's house, office or manufactory with a central station, so as to give him the benefit of direct telephonic communication with his neighbors, at a cost not greater than that incurred by gas or water.

At the present time we have a perfect network of gas pipes and water pipes throughout our large cities. We have main pipes laid under

the streets communicating by side pipes, with the various dwellings, enabling the members to draw their supplies of gas and water from a common source.

In a similar manner it is conceivable that cables of telephone wires could be laid underground, or suspended overhead, communicating by branch wires with private dwellings, country houses, shops, manufactories, etc.—uniting them through the main cable with a central office, where the wire could be connected as desired, establishing direct communication between any two places in the city. Such a plan as this, though impracticable at the present moment, will, I firmly believe, be the outcome of the introduction of the telephone to the public. Not only so, but I believe in the future, wires will unite the head offices of telephone companies in different cities and a man in one part of the country may communicate by word of mouth with another in a distant place.

I am aware that such ideas may appear to you utopian and out of place, for we are met together for the purpose of discussing not the future of the telephone, but its present.

Believing, however, as I do, that such a scheme will be the ultimate result of the telephone to the public I will impress upon you all the advisability of keeping this end in view, that all present arrangements of the telephone may be eventually realized in this grand system.

The plan usually presented in regard to private telegraphs is to lease such lines to private individuals, or to companies at a fixed annual rental. This plan should be adopted by you, but instead of erecting a line directly from one to another I would advise you to bring the wires from the two points to the office of the company and there connect them together; if this plan be followed a large number of wires would soon be centered in the telephone office where they would be easily accessible for testing purposes. In places remote from the office of the company, simple testing boxes could be erected for the telephone wires of that neighborhood, and these testing places could at any time be converted into central offices when the lessees of the telephone desire inter-communication.

In regard to other present uses for the telephone, the instrument can be supplied as cheaply as to compete on favorable terms with speaking tubes, bells and annunciators, as a means of communication between different parts of the house. This seems to be a favorable application of the telephone, not only on account of the large number of telephones, that would be wanted, but because it would lead eventually to the plan of inter-communication referred to above; I would, therefore, recommend that special arrangements should be made for the introduction of the telephone into hotels and private buildings in place of the speaking tubes and annunciators, at present employed. Telephones sold for this purpose could

be stamped or numbered in such a way as to distinguish them from those employed for business purposes, and an agreement could be signed by the purchaser that the telephones should become forfeited to the company if used for other purposes than those specified in the agreement.

It is probable that such a use of the telephone would speedily become popular, and that as the public became accustomed to the telephone in their house, they would recognize the advantages of a system of inter-communication. When this times arrives, I would advise the company to place telephones free of charge for a specified period in a few of the principal shops so as to offer to those householders who work with the central office, the additional advantages of oral communication with their trades-people. The central office system once inaugurated in this manner would inevitably grow to enormous proportions, for these shop-keepers would thus be induced to employ the telephone and as such connections with the central office increased in number, so would the advantages to householders become more apparent, and the number of subscribers increased.

Should this plan ever be adopted, the company should employ a man in each central office for the purpose of connecting the wires as directed. A fixed annual rental could be charged for the use of the wires, or a toll could be levied. As all connections would necessarily be made at the central office, it would be easy to note the time during which any wires were connected and to make a charge accordingly. Bills could be sent in periodically. However small the rate of charge might be, the revenue would probably be something enormous.

In conclusion, I would say that it seems to me that the telephone should immediately be brought prominently before the public, as a means of communication between bankers, merchants, manufacturers, wholesale and retail dealers, dock companies, water companies, police officers, fire stations, newspaper offices, hospitals and public buildings, and for use in railway offices, in mines and (?) operations.

Arrangements should also be speedily concluded for the use of the telephone in the army and navy and by the postal telegraph department.

Although there is a great field for the telephone in the immediate present, I believe there is still greater in the future.

By bearing in mind the great object to be ultimately achieved, I believe that the telephone company can not only secure for itself a business of the most remunerative kind, but also benefit the public in a way that has never previously been attempted.

I am, gentlemen, Your obedient servant,

(Signed) ALEXANDER GRAHAM BELL.

Through the Book Department of TELEGRAPH AGE you can obtain any book desired. Send for the new catalogue.

A Telegraph Official Circularizes His Division, Urging the Benefits of Study.

The circular letter which follows below addressed to "All Employees," has been issued by G. E. Paine, assistant general superintendent of the Postal Telegraph-Cable Company, at Atlanta, Ga.

An effort such as this to stimulate study and consequently to increase efficiency among telegraph employes, is highly commendable. It is a pointing out of the way, missionary work of the highest character. It shows an honest desire on the part of executive management to aid in promoting the betterment of those under them. The underlying motive governing the issuance of this circular and all other efforts of like character, of which instances are becoming numerous, to elevate the general welfare in the telegraph service by advancing information, should not be lost upon those whose benefit is intended. The act is not promoted by selfishness, although in the results sought the telegraph would derive benefit, and very properly so; but the effect on the willing and receptive mind of the individual, would be such as to better and more quickly fit him for promotion; and the telegraph, as we have so often said, has urgent need of the services of better educated men, men with a broader technical understanding of their avocation. Here is the circular:

Postal Telegraph-Cable Company.

Office of the Assistant General Superintendent.
Circular No. 117.

Atlanta, Ga., Oct. 28, 1908.

All Employees:—I often wonder why, in view of all we have previously said on the subject, our managers, operators, clerks and linemen all do not seem to realize the benefits which would surely follow to them if they would provide themselves with a few inexpensive books and study the subject of electricity as applied to the telegraph.

A good, cheap book to begin with is Jones' Pocket Edition of Diagrams (\$1.50); a better and more interesting one is Maver's American Telegraphy (\$5.00). Either of these can be secured for you by local book sellers, or from Telegraph Age, 253 Broadway, New York.

If only one page a day is gone over, each one would be surprised to see what beneficial progress has been made in six months and very much more in a year.

Students should not be discouraged because the subject may at first seem a difficult one, but should re-read each page until it is understood. It is not especially difficult, but it will take time and study and a good deal of it, just as it took a great deal of time (though you have probably forgotten it) to learn to read and write and to understand arithmetic.

We will be glad to help any employe at any time if some problem comes up which he or she cannot understand.

I hope every employe will have an opportunity to read this letter, and if any are encouraged thereby to fit themselves for better positions, or to better perform the duties of their present positions, I shall feel many times repaid for this and all previous "missionary work" of this character which it has been my pleasure to perform.

Sincerely,

G. E. PAINE,

Assistant General Superintendent.

The Artom System of Radiotelegraphy.

Whoever has followed in the slightest the marvelous development of wireless telegraphy must certainly be aware of the serious difficulties that were in the way of the practical application of this wonderful method of communication, says Professor Alessandro Artom in a communication to the Italian Electrotechnical Association, and printed in the *Electrical Review* and *Western Electrician*. It happened continuously that wireless messages sent by a certain transmitting station were caught by all the receiving stations within the circle comprising the average transmitting distance of the station. Atmospheric electricity also caused serious disturbances, so that at times the service had to be suspended for hours. It was necessary to give to the phenomenon of the propagation and reception of the electric waves a much more definite character, and, in order to meet the exigencies of practice, it was necessary to develop systems of radiotelegraphy which would make it possible (1) to send the effects of the transmitting apparatus mostly in one definite direction—that is, to find means of directing the electric waves; (2) to render the receiving apparatus most sensitive to waves coming from a certain direction; (3) to prevent the serious disturbances due to atmospheric electricity; (4) to make the receiving apparatus insensitive to waves emanating from extraneous transmitters. Artom says:

“When the work of Marconi was first announced it occurred to me that for a practical solution of the problems mentioned he might have turned to the use of phase difference between two or more electrical oscillations. To produce practically a difference of phase between two Hertzian vibrations of the order employed in wireless telegraphy appeared at that time impossible, but later the idea spread and it is now applied in numerous wireless systems. In my own work I have found it most useful to employ rotating electric and magnetic fields generated by two electrical oscillations differing in phase for proving the existence of phase differences.

“The rotating magnetic field is generated by two windings, through one of which flows the principal oscillating current, and through the other a current induced by means of a small transformer of a few turns. The existence of the rotating magnetic field can be easily demonstrated by introducing an armature into the field. The existence of very high-frequency rotating electrostatic fields may be demonstrated in various ways, for example, by the use of a Braun tube, which obviously is also eminently suitable for showing the magnetic field. In order to influence the cathode beam of the Braun tube by the vibrations of the high-frequency electric field it is only necessary to fasten to the neck of the tube, a little below the diaphragm, two pairs of tinfoil strips, properly insulated, at right angles to each other on the periphery of the tube, and connect the strips with four points of the oscillat-

ing circuit, between which there exist differences of potential out of phase. The effects of a rotating electric field may thus be easily observed; the cathodic spot describes open elliptical forms manifesting themselves in the shape of spirals, since the oscillations are damped. These elliptical forms, according to which the electric lines of force, resulting from the composition of two electrical oscillations of different phase arrange themselves, may conveniently represent a transverse section of a beam of rays of electric force analogous to a beam of light polarized elliptically. Having thus demonstrated experimentally the composition and interference of two electrical vibrations, I endeavored to apply the effect to wireless transmitting and receiving apparatus with a view of producing unsymmetrical electromagnetic fields and devised for this purpose a number of arrangements of aerial conductors which constitute one of the characteristics of my system of radiotelegraphy. These consist of two or three aerial conductors inclined toward each other at angles which may vary from zero to 180 degrees, but which may generally be most conveniently chosen between forty-five and ninety degrees. When oscillatory currents of displaced phase are sent into aerial conductors arranged in this manner they possess remarkable properties regarding transmission as well as receiving, as experiments made under the auspices of the Italian Royal Navy have shown. As regards the transmitting aeri-als, the following facts will be observed at once: (1) in the aeri-als inclined toward each other the mutual induction is very small, when oscillating currents flow through them. This fact permits of establishing absolutely in advance the period of oscillation to be used in the transmission; (2) the inclination of the aeri-als toward each other serves to produce the phenomena of composition and interference between electromagnetic waves emitted by two conductors, because it compels a superposition of the respective beams of electric magnetic lines of force; (3) when connected to an oscillator or to a receiver, these two aerial conductors constitute an arrangement that is in electrical equilibrium, in the sense that the electrical capacities of the two branches, with regard to the earth, are of remarkably equal value, so that the ground connection of the transmitting as well as receiving apparatus may be eliminated, as has been demonstrated in practice. This is of practical advantage.

“The various types of aeri-als shown are approximately equal in their effects, but the triangular arrangement presents some practical advantages in that it requires only one mast. Experience has shown, furthermore, that with this arrangement it is possible to obtain quite well conditions of sympathy between transmitter and receiver.

“The characteristic property of the transmitting apparatus is the production of a profoundly unsymmetrical magnetic field, that is, directed electric waves, as the experiments made by the Royal Italian Navy have demonstrated. The use of in-

clined aerials alone evidently constitutes a reason for the unsymmetrical character of the effects. But an experience of years has demonstrated a property, which is also possessed by some other systems using two aerials, namely, that the axis of propagation according to which the electromagnetic effect reaches the greatest distances may be perpendicular to the plane of the aerials, or it may lie in the plane of the aerials themselves. When the oscillating currents in the aerials are made to differ in intensity as well as in phase, that is, if they are of different amplitude, this axis of greatest propagation may be inclined in any direction with respect to the plane of the aerials. This fact is useful in practice, as a wireless telegraph station should evidently be able to meet any special conditions imposed by its topographical position.

"In fact, it is possible to vary the constructive elements or form of these aerials as well as their electrical elements, that is, the amplitude and phases of the oscillating currents by which they are excited. Furthermore, supplementary aerials may be added which will greatly reduce the radiation in the direction of the plane of the aerials. Their effect is evidently to generate interfering fields, or fields opposite in sign to the principal electromagnetic field. In experiments made in 1904, in which these aerials were lengthened and arranged almost horizontally in the direction of the receiving station, an increase of radiation in that direction was observed.

"As has been stated, the electrical elements of the apparatus may also be varied; it may be operated with or without ground connection, the difference of phase between the currents may be varied from zero to 180 degrees, and the relation of the amplitude between the two currents may be made to differ. Thus it will be seen that with the arrangement described it is possible to obtain curves of distribution of energy corresponding to the most widely differing azimuth angles, these curves being the natural consequence of the arrangement devised by me.

"In order to apply the idea of phase difference to the reception of signals I devised various types of receiving apparatus, but the one that proved most successful was an arrangement resembling the differential galvanometer. Three coils are arranged on a core which may be of insulating material or of iron wires. The central coil is connected to any kind of electric wave detector. Alongside of the central coil are two other coils, each of which has one of its terminals connected to one of the two antennæ, the other ends are joined together and may be connected to the ground or not. These two coils may be made to act by induction on the central coil in such a way that their effects are either in opposition or in accord. When they act in accord on the central coil and the apparatus is connected to the ground, it will receive signals like an ordinary aerial from whatever direction they may come. But when the two receiving antennæ are arranged in the

plane of the waves arriving from the transmitter, the waves strike first one aerial and, after a certain time, the other one that is further removed from the transmitter. The magnetic flux generated in the two coils induces currents in the central coil, which is connected to the detector and behaves according to known laws. Assuming, on the other hand, that the two aerials are affected at the same instant, then the flux generated in the two coils is equal, of the same phase and opposite in direction, and the effect on the induced circuit connected to the detector is practically nil. The result is that from all transmitting stations outside of the plane of the receiving aerials, and more particularly from those stations in a perpendicular direction, the electromagnetic effects arrive at the two receiving aerials at the same instant and the receiving apparatus is not sensitive to them. The same is true in the case of electric waves due to atmospheric electricity. When the ground connection is eliminated the two coils may be dispensed with and the apparatus assumes a simple form, and its operation is then principally due to the electromotive force resulting from the magnetic flux traversing the space included by the aerials. The effect is maximum when transmitting and receiving aerials lie in the same plane. This physical fact was made use of by me in the fall of 1905 with very good results for determining the position of transmitting stations on vessels and on land.

"The selective properties of my receiver with triangular aerials have been made still more distinct by the use of electromagnetic sympathy, and special apparatus were invented in which, in addition, local sympathy was employed, that is, the apparatus has a slow natural period of vibration at which alone it will operate. This local sympathy is determined, as regards the transmitter, by the low-frequency current feeding the coils or transformers and, as regards the receiver, by a very weak alternating current under the influence of which only the receiver can act. This apparatus was devised about two years ago, and in experiments made proved to be very sensitive and well suited as a receiver in wireless telephony."

Among a number of books on the market treating of the general subject of train despatching, that bearing the generic title of "The Train Dispatcher," written by A. W. Early, a train dispatcher himself, has gained a wide popularity, its value being based on the fact that it is one of the best books of the kind ever produced. It supplies a certain practical information of a class desired by the ambitious worker as a guide and inspiration to him in his daily work. Its 104 well printed pages are packed full of educatory matter, and the volume should be, as it has been, a welcome possession to every telegraph operator and train dispatcher in the railway service. This book will be sent to any address on receipt of price, \$1.00. Address J. B. Taltavall, Telegraph Age, 253 Broadway, N. Y.

The Way-Station Switchboard Explained and Light Thrown on Problems of Line Connection.

BY J. H. GINGRICH,
Chief Operator, Postal Telegraph-Cable Company,
Harrisburg, Pa.

(From the Railroad Man's Magazine.)

One of the first duties of the new way-station telegrapher may be to "cross-connect" or otherwise change the wires, in order to "clear" a wire upon which the movement of trains depends, or to "make good" an important message circuit. It is not difficult to make these changes, and the principle of cross-connecting wires is simple and easily learned.

Nor is there anything complex about the switchboard itself; a few words will explain it. If the telegrapher will look at his switchboard, he will see a number of vertical brass straps, with binding-posts attached, to receive the line wires; also, a number of rows of little brass circles called disks, each disk being provided with an extension which passes through the board and connects with a wire or strap of copper running across the back of the board.

The number of horizontal wires or copper straps on the back of the board corresponds with the number of vertical straps in front. The binding-posts at the side of the board are connected with these transverse straps, and to these binding-posts the wires leading to the instruments are connected.

There is a cavity in each side of the disks, and a similar recess, directly opposite, in the adjoining vertical strap, so that a brass plug, provided for this purpose, inserted in the hole between strap and disk, connects them electrically. A pair of vertical straps are required for each wire in and out, and likewise a pair of horizontal straps on the back of the board, or rows of disks in front, which is all the same, are required for each set of instruments.

The first row of disks on the board are "grounded;" that is, a wire having been firmly wrapped around and soldered to a water-pipe, or otherwise securely fastened in moist earth, is connected to this row of disks. A plug inserted between any of these grounded disks and vertical straps "grounds" the wire connected to that strap.

The lightning arrester usually consists of a large round brass disk, located immediately under the line-posts and arranged to screw on a stud which passes out between, but does not touch the vertical straps. These studs are connected together on the back of the board, and are also permanently connected to the ground wire.

The brass disks are then screwed down close to, but not touching, the vertical straps, a space about large enough to admit one thickness of heavy writing-paper intervening. This space between the disk and strap presents an impassable barrier for the current in the wire; but the nature of the lightning discharge when it follows the

wires is to jump from the brass straps, to which the wires are connected, to the disks which are connected with the ground wire; and the lightning is "arrested" in its course or diverted to the ground.

Should a conducting substance come between a line strap and an arrester disk, the wire connected to that strap will be grounded. It frequently happens during thunder-storms that lightning will fuse the disks, leaving little pieces of brass protruding from them which touch the vertical straps, and thus ground the wires. The disks, therefore, should be examined after thunder-storms and rubbed clean and bright with sandpaper.

The wires entering the modern way station, before reaching the lightning arrester, are provided with a little piece of fine wire, so arranged that it forms a part of the line wire; this piece of wire is called a "fuse," which will burn off, and thus open the line, should the line accidentally cross with an electric light or power circuit, or receive a heavy lightning discharge.

The instrument circuits are also protected with fuses. The fuse in the main line is usually designed to carry from ten to twenty amperes before fusing; and the fuse in the instrument circuit one-half ampere. When a fuse opens, the heavy current cannot enter the office, and the instruments are protected and a fire averted which might destroy the office itself.

Sometimes these fuse wires are broken by accident, and consequently the wire is open; but a fuse may be tested easily and quickly by spanning a piece of wire from one end of the fuse to the other, making contact, of course, with the wire on the metal at each end; if the fuse is open, the circuit will close through the spanning wire, which will be indicated by the closing of the instrument in that circuit. The wire should be insulated, except where contact is made.

Regarding the vertical straps of the switchboard as the ends or terminals of the line wires, and as conveniently arranged with respect to the transverse straps connecting the rows of disks together, it is at once apparent that these wires may be connected easily to the instruments or to each other.

When we wish to connect two wires, we simply pick out one of the wires, follow it down to the brass strap, and put in a plug connecting the wire with a disk. The disk is connected to the horizontal strap on the back of the board, so that we have now lengthened out the wire we are tracing, just as though we had connected a piece of wire to it, the extension, of course, being the strap on the back of the board, which extends across the entire width of the board.

Guided by the row of disks, we follow the strap on the back of the board until we meet the wire we wish to connect with, and another plug at this point completes the connection. We have thus, in effect, connected two line wires together, just

as though we had taken them out of the binding-posts and wrapped their ends together.

But we have done it in infinitely less time and with infinitely less effort. Yet, simple as it is, there are still telegraphers here and there who prefer to make these connections by taking the wires out of their posts and twisting their ends together—a slow, laborious and altogether needless task. These telegraphers, no doubt, are satisfied to remain at the way station, satisfied with themselves, with the philosophy that the world is flat, and that there is nothing new under the sun.

The telegrapher who looks beyond the way station should bear in mind that his ability to speed dots and dashes will not alone qualify him for advancement.

A glance reveals the principle of cross-connecting wires on the switchboard just described—or, in fact, on any switchboard—for they are all the same in principle, though they differ in detail. This principle is obviously that of providing a path for each particular circuit, which shall not enter or conflict with the path of any other circuit.

Seasoning and Treating Telephone Pole Cross-Arms.

(From United States Forest Service.)

There are used every year in the United States about 14,000,000 cross-arms for telephone and telegraph poles. Of these, perhaps one-fourth are now treated with preservatives to increase their durability, and there are at least five plants, at New York City, Norfolk, Va., New Orleans and Sliddell, La., and West Pascagoula, Miss., at which cross-arms are treated. Because of their small size as compared with the strength required and the weakening effect of the holes for insulator pins, and their constant exposure to all kinds of weather, cross-arms should receive a thorough treatment. A good treatment with creosote will at least treble their durability.

A large portion of the supply of cross-arms comes from the South; they are sawed from the loblolly or old field pine, of which there is a large quantity throughout this region. This tree grows rapidly, but contains much sapwood, which is difficult to season. It has been said that "loblolly pine sapwood will rot before it will season in the warm, damp climate of the South." While this is probably overdrawn, it is necessary so to pile the cross-arms that the air may circulate freely about them, and to protect them from rain and snow by a roof of loose boards. By laying twenty cross-arms in a tier, two cross-arms at each side and two in the middle set on edge, and allowing a small space between each of the others, which are laid flat, favorable conditions for seasoning are established and no rotting will occur.

Sapwood absorbs preservative so much more rapidly than heartwood that when both cross-arms in which sapwood abounds and those in

which heartwood predominates are treated in the same run the former absorb an excessive amount before the latter have received what they require. This is not only a needless expense but a detriment, inasmuch as the excess of creosote in the sapwood later oozes out and drips on those who walk beneath. To solve this difficulty, the cross-arms should be sorted in three classes, as sapwood, intermediate, and heartwood, and treated in different runs.

Cross-arms are treated in large horizontal cylinders varying from ninety to one hundred and eighty feet in length and from six to seven feet in diameter. Into these the arms are run on skeleton trucks, and the doors are then bolted airtight. Creosote is next run until the remaining space in the cylinder is filled. Pressure is sometimes then applied by pumps to force the preservative into the wood. In some instances before the preservative treatment the cross-arms are treated to a bath of living steam followed by the drawing of a vacuum, to remove moisture and secure rapid penetration of the wood by the preservative. It is the opinion of the Forest Service, however, that the bath in steam is not necessary or desirable if the arms are properly air seasoned.

The Miniature Sounder at the Carnegie "73" Dinner.

The miniature telegraph sounder presented to each of the guests at the "73" dinner tendered recently by telegraphers to Mr. Carnegie, in New York, in honor of his seventy-third birthday, aroused much enthusiasm. The device was regarded as an eminently fitting souvenir of an occasion which drew together in the spirit of *auld lang syne* so many distinguished members of the craft, past and present, especially so as it was a perfect piece of mechanism and fully capable of performing the work required of a like instrument of normal size. The little affair, which is beautifully finished, was highly prized by the recipients at the dinner as being emblematic of the profession. Indeed, such was the interest shown that numerous inquiries have since reached *Telegraph Age* requesting to know if it was possible to procure duplicates of the same.

In recognition of the sentiment that has prompted these inquiries, the utility of the device itself, and its appropriateness as a holiday gift to and by a telegrapher, *Telegraph Age* has made arrangements by which it can fill all orders for the same. The key alone, the smallest ever manufactured and which is the same as the one presented at the memorial reunion of the Old Time and Military Telegraphers in New York in 1905, will be sent in a box to any address, carrying charges prepaid, on receipt of \$1.50; the sounder at \$2.50, or both at \$4.00. Address J. B. Tallavall, *Telegraph Age*, 253 Broadway, New York. An advertisement of this key and sounder appears elsewhere in this issue.

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The Railroad.

Mr. John F. Maguire, who has been appointed general manager of the Lehigh Valley Railroad Company, with headquarters at South Bethlehem, Pa., began his railroad career as a telegrapher, and has occupied almost every subordinate position in the railroad service prior to reaching the head of this system.

Miss Gladys Camp, daughter of W. J. Camp, of Montreal, electrical engineer of the Canadian Pacific Railway Company's Telegraph, and president of the Association of Railway Telegraph Superintendents, is visiting friends in New York and is at present a visitor at the home of Mr. E. P. Griffith, superintendent of telegraph of the Erie Railroad, at Passaic, N. J.

Mr. E. K. Dyer, son of I. T. Dyer, superintendent of telegraph of the San Pedro, Los Angeles and Salt Lake Railroad, at Los Angeles, is looking after the railroad interests on the Pacific Coast for the Western Electric Company. Mr. Dyer has had considerable experience in the electrical supply business and is well adapted to fill the requirements of his new position. His headquarters will be at San Francisco.

The Western Committee of the Association of Railway Telegraph Superintendents on systems located west of Buffalo and Pittsburg met in quarterly session at St. Paul, Minn., on December 14 and 15. The principal discussion of the meeting was "Telephone Train Dispatching." The delegates to the meeting were entertained at the Transportation Club, of which Harry C. Hope, superintendent of telegraph of the Chicago, St. Paul, Minneapolis and Omaha Railroad, is the president.

Mr. G. W. Dailey, superintendent of telegraph of the Chicago and Northwestern Railway, having been advanced to the position of superintendent of the western division of the road, the vacancy of superintendent of telegraph has been filled by the appointment of W. Bennett, who is advanced from the position of assistant division superintendent. Mr. Bennett's headquarters will be at Chicago. W. P. McFarlane is the assistant superintendent of telegraph of the system, with headquarters at Omaha.

Concerning the use of concrete telegraph poles along the line of the Pennsylvania Railroad, about which so much has found its way into print of late, Mr. G. A. Cellar, of Pittsburg, superintendent of telegraph of the Pennsylvania Lines West of Pittsburg, in writing to Telegraph Age on the subject said in a note: "We recently put up a mile of these poles, through the town of New Brighton, Pa. There are so many considerations bearing upon the use of concrete telegraph poles that I hesitate to attempt stating them in such a letter as I am able to write at this time. The cost of construction, as well as that of placing the poles in the line, is considerable, and the expan-

sion of railroad properties may make the removal of any line a necessity within a few years, or the expansion of the telegraph service may cause the capacity of the line to be outgrown in a short time. There are many things which enter into the matter of use of these poles which can hardly be discussed within the limits of a letter, and must be deferred until the subject can be taken up in a personal interview."

The Underground Telegraph Extension In England.

The Associated Chambers of Commerce of the United Kingdom recently asked the Postmaster-General to lay underground telegraph wires to Land's End, so as to obviate the frequent interruption of telegraphic communication caused by storms, which interferes with the prompt transmission of telegrams from the East received over the Eastern Telegraph Company's cables at Land's End. The Postmaster-General replied that the wishes of the Chambers had long since been anticipated, for in his report for last year he expressed the hope that the underground line would reach Penzance during the current financial year, and he trusts no very long time may elapse before it is completed to Porthcurno.

Ohms Law Made Easy.

BY CARL OTTO, CHICAGO.

"E" stands for the pressure Which we are taught to use, Divided by "R," resistance, Will give us "C," the juice.	$\frac{E}{R} = C$
"C" is "E divided by R," With this we don't get very far. But "E" is "R times C," you see.	$C = \frac{E}{R}$ $E = R \times C$
And "R" is "E divided by C."	$R = \frac{E}{C}$
"W." watt is "Current times Electromotive force." And "seven forty-six" of them The "Power of a horse."	$W = C \times E$ $746 = H.P$

What was once the Speedwell Ironworks at Morristown, N. J., where Samuel F. B. Morse, the inventor of the telegraph, did much of his preliminary work in perfecting his telegraphic instruments, and where the first steam engine of the first steamship that crossed the Atlantic was built, has been destroyed by fire. For many years the building had been unoccupied.

Local patriotic societies made an effort to raise funds to preserve it as a landmark, but the proposition came too late. The ironworks were established by Colonel Jacob Arnold in 1776. In 1812 Judge Alfred Vail took over the plant and enlarged it, and, with Morse Alfred Vail made his experiments with the electro-magnetic telegraph.

Standard Time and the Railway Association.

At the November meeting of the American Railway Association, resolutions were passed congratulating William F. Allen on the successful operation for a quarter of a century of the system of standard time originated by him and adopted in 1883. Mr. Allen replied as follows:

It was the enterprising spirit of the railway men of 1883 which made possible the adoption of Standard Time, and among them I must refer to the names of such men as P. P. Wright, E. B. Thomas, James McCrea, Charles E. Pugh, J. R. Kenly, Geo. W. Parker and H. S. Haines, all well known to you, and to those of J. M. Toucey, A. A. Talmage, H. B. Stone and Charles Stiff, who have passed away. They were all most active and important factors in support of the proposed reform. There are many others worthy of honorable mention, whom I should like to here recognize if time permitted.

Let us look back for a moment at the conditions that prevailed prior to November, 1883. There was then fifty-three times of various cities, in use by our railways and by the people generally, and it is doubtful if there were more than a dozen railway officials in the country who could have stated from memory what time was used upon any road other than their own and the few with whom they had direct business connections. To the traveler the puzzle was a difficult one, and without the aid of a guide almost impossible of solution. So crude were some of those standards that one railroad superintendent reported, in response to a circular of inquiry, that the standard of his road was "the superintendent's watch."

In the task of resolving this chaos into order, the political situation of affairs at that epoch was a fortunate one. The power of the national government and of the state governments was not evoked, nor was it desired, in the movement for the accomplishment of the reform. The co-operation of the officers of the Naval Observatory at Washington, and of the Signal Service department was most cordially given, because they recognized the advantage that would accrue to their respective services.

It had not then been announced as a political axiom, as it was recently, that "men accustomed to large affairs are somehow untrustworthy and must be restrained by those less competent, but more numerous at the polls."

The spasm of unjust prejudice against railways, fostered by ignorance of facts, and fed by personal ambition, now, we trust, about to pass away, had not then begun to exercise its baleful influence; nor had the adoption of unwise methods, for the correction of certain abuses, obstructed the operation and development of our transportation lines and injuriously affected the growth of the industries of our country. There were at the time many men of influence still living, who knew what the country was before our railways had been constructed by their enterprising builders, and who understood and ap-

preciated the part they had played in its progress.

In other parts of the world similar movements of reform in time-keeping have since been accomplished by means of the enactment of laws or by Imperial decrees. Here (and in saying this I do not wish to appear to ignore the co-operation of scientific societies) standard time was practically the gift of the railways to the public. Following the intelligent leadership of our railroad officials in all parts of the country, the people acted for themselves in adopting the new time, and it was therefore essentially a movement "of the people, by the people, for the people," apart from politics or political influences. Then, having adopted the new custom, in pursuance of that liberty which governs the practices of a free people, they proceeded to enact their custom into law.

It is my belief that no government in this country has ever been strong enough (and I trust none ever will be) to impose upon the American people such a change, even for their common good, as the one they voluntarily adopted on November 18, 1883. Nor could it have been brought about by the government, with all its recent assumption of power, without the free and hearty co-operation of those forces, which then proved sufficient of themselves.

In view of recent existing conditions, I am constrained also to believe that the reform, successful in 1883, would have been hopeless of accomplishment if it had been attempted in 1908.

On that beautiful Sunday morning of November, 1883 (which many of you will recall), when the hour arrived at twelve, by the old time, in New York City, I heard the bells of St. Paul's chapel toll the old hour for the last time, followed by a fateful interval of four minutes. Then, as previously arranged, obedient to an electrical signal from the Naval Observatory at Washington, the Western Union time ball fell, old Trinity's chimes rang out on the new hour, and the chaos of local times over a whole continent was resolved into the order which has since prevailed.

Since then the work of The American Railway Association has steadily progressed onward and upward towards the attainment of the highest degree of efficiency in railway management and operation. You may raise rates as high as justice and reason will permit; you may borrow money for improvements at the lowest rate of interest; you may economize in every way possible; but without efficiency in operation all other things may go for naught. And I venture to assert that the degree of prosperity of any country is in direct proportion to the efficiency of the operation of its railways.

I regard The American Railway Association as having been a most potent factor in the advancement of that efficiency and that prosperity. It has never been in the hands of abler men than those of to-day. In thanking you most appreciatively for your action, I desire to say in return, that I know of no wish that will be more acceptable to you, nor one that I can more heartily

extend, than that its labors may meet with the same success in the future as they have in the past.—*Railroad Age Gazette.*

Signalman Becomes a Harvard Lecturer.

James Fagan, a signalman in the employ of the Boston and Maine Railroad, stationed at a point just outside of Boston, abundantly illustrates in his career the possibilities that await the observant, the faithful and studious within the various spheres that furnish the environment of so many.

The little tower in which he has been working and thinking these twenty-two years is as dingy and unattractive as its surroundings, and is no different from the hundreds of other railroad signal towers scattered throughout the country. The steel levers, the clicking instrument, the dreary view up and down the tracks—the average student of economics would not consider these the most advantageous surroundings for mental effort, but here Fagan has learned enough about railroad problems to qualify him as a lecturer in Harvard University. Eight hours a day of work in the tower and almost as much again of study in his little home in Waltham have made him one of the most remarkable men in this country to-day.

He is now fifty years old. The first twenty-five years of his life were years of wandering and adventure; the last twenty-five have been years of observation and study. His birthplace is Inverness, Scotland, and there he passed the first ten years of his life. When he was ten years old he won a scholarship in a school in Manchester, and went there to study. Although he took the regular "classical course" of forty years ago, he was much interested in electrical subjects, and he specialized in electricity. Next he apprenticed himself to a cable-laying expedition, which took him from Portugal to Rio de Janeiro, by way of the Canary Islands. For several years he worked in South America as a cable operator. Then he was caught up in the rush to the South African gold mines. In South Africa he fought against the Kaffirs as an enlisted soldier, and when the fighting trade was not good he spent his time as gold miner and trader. After the battle of Majuba Hill he decided that he had been in South Africa long enough and came to the United States. In 1881 he went to Boston, and got a position on the Boston and Lowell Railroad; in a few months he changed to the Fitchburg Railroad, and went to East Deerfield, Mass., where he worked for five years. The next and last change was to the signal tower in North Cambridge, where he has been since 1886.

All this shows where Mr. Fagan got his knowledge and experience, but it does not show how he got out of the rut into the public eye. No one can justly claim to have discovered him, for he discovered himself. Some time ago *The Atlantic Monthly* devoted a good deal of space to various articles on railroad problems. He read these

articles with great interest, and he saw in them many statements which did not agree with his own experience. He thought it over for a while, and one day he went to call on the editor. He told the editor what he thought about it, and the editor's answer was, in effect, that if he did not like the way the articles were written he could try to do better.

He immediately started to write. The result of his efforts is the series which appeared under the title of "The Confessions of a Railroad Signalman." These articles are not of a nature which tends to increase our national pride in our railroad system, for they are in effect a rather severe arraignment of the management of all railroads in general, and of his own, the Boston and Maine, more particularly, but none of the railroads has sued *The Atlantic Monthly* for libel.

This series of articles brought him to the attention of the public, and it was not long before President Eliot called him to Cambridge to confer with him. President Eliot saw that he knew what he was talking about, and he appointed him to lecture before the new School of Business Administration. He will give a series of lectures next spring, but the subject and the exact time have not been decided on. Soon after his interview with President Eliot he was called to Washington for a conference with President Roosevelt. What passed between them has not been revealed, but Fagan's reputation was made.

His work is not at all destructive, and now that he has told what ought not to be done he is getting up a new series of articles telling what ought to be done, under the title of "The Industrial Dilemma." The answers of the railroads to the first series of articles have been chiefly of the "What else can we do" sort, and it will be interesting to see whether Mr. Fagan has gone deeply enough into the subject to tell them what they can do to improve things.

Just to fill in his spare time he is lecturing in different parts of the United States, now in Chicago, now before the convention of railroad surgeons in New York, or before the City Club of Boston, and he is beginning to make people believe that he is not "working for himself all the time," but at least part of the time for his ideals of what the American railroad ought to be.

And, finally, this altogether remarkable man works eight hours a day in the little dingy tower in North Cambridge when he is not speaking in some other part of the country, because "it keeps him in touch with his subject."

The Government of India contemplates the raising of the inland rates for telegrams by fifty per cent., the present rate, for so-called "deferred" messages, of 4d. for ten words, including address, having been found to involve a heavy loss. In future "ordinary" messages will be charged 6d. for twelve words, and "express" messages one rupee (1s. 4d.) for twelve words.

Telegraphs Have Always Existed.

This is putting it pretty strong, and the fact may be a trifle overstated; but away back in ancient history we find that information was sent gliding over the world in very short order. In these days of all sorts of telegraphy, we are tempted to pity our remote forefathers for their not knowing what happened soon enough to take advantage of it; but they did very well, thanks.

Less than a day after a Roman emperor died, it was known all over his dominions—even to the furthest outpost of the furthest outlying armies. The same week that Alexander, the great Macedonian Emperor and General died, the whole civilized world was talking about it, and scheming how to take advantage of the unexpected event. When Antony was in Egypt with Cleopatra, they were always up to date in Rome, as to the progress of his wooing and the diminishing probabilities of his military success.

The early telegraphic systems largely grew out of the requirements of ancient military life. "We are such clever fellows nowadays," as a friend observed, that "we are apt to think that this age is the only one that has been able to communicate intelligence quickly;" but Aeschylus, in his *Agamemnon*, describes a system for the rapid communication of information by burning torches as signals.

The beacon, the fire-signal, burned on the lofty mountain tops, was, perhaps, the most primitive method by which the ancients transmitted a message from point to point. In the Book of *Jeremiah* there is a reference to the signal-fire to be kindled on top of the mountains: "Set up a sign of fire in Bethhaccerem; for evil appeareth out of the north, and great destruction."

The fire-signal was in use in ancient Persia, Palestine and Greece. By such means the Greek commander is represented to have conveyed to his queen, Clytemnestra, the intelligence of the fall of Troy, the news reaching Mycenæ, in the Peloponnese, from Troy, in one night. Beacons were made to be effective by day as well as by night, the fire being so built that it would emit much or little smoke; light smoke indicated the graver nature of the intelligence and the need of caution, while dense smoke was mandatory, and meant prompt action; an Act of Parliament of Scotland, in 1455, directed that one signal-fire would be a warning of the approach of the English, and four fires would mean that they were in great force.

The American Indians had the idea of conveying intelligence by fire-signals, by flame and smoke, when first discovered by the whites. They used regular stations over the Western country; and the movements of Fremont, as he passed through their territory, were made known to them. In England there was a county-tax to continue the beacons in repair, and they were carefully looked after.

The ancient Greeks and Romans recognized the necessity of rapidly sending orders to a dis-

tant point and elaborated a system of communication, for military purposes, by means of torches. Telegraphy, with torches, is described by Polybius, who died about 122 B. C., and he calls the different instruments used for conveying information, *pyrsiae*, because the signals were always made by fire. The Romans filled pots with burning straw and twigs, saturated in oil, the flame of which was visible at a great distance; and by a previously-understood code messages were freely exchanged. By the lighting of a definite number of torches, and the order in which they were displayed, or extinguished, certain letters were indicated, and the result in words was made apparent. The Grecian commander, Aeneas, perfected a method which anticipated modern systems of communication, really conceiving the idea of the alphabet by signs.

Lights and torches at night could be so used as to indicate the alphabet of twenty-four letters, divided into three classes of eight letters each, and designated by one, two or three torches, and the number of the letter was signified by the number of times the torches were elevated. During the day flags were used; and the shields of the soldiers also, which, displayed in some understood manner reflected the rays of the sun, flashing an order or a piece of intelligence from one point to another. Such communications were the more readily transmitted, in those old fighting days, because every hilltop near to a military encampment had its sentry on the alert, and watch-towers were plentiful in all centers of population. For the ordinary purposes of communication, it was customary to have relays of trained runners, men of pith and sinew; and the custom prevails to-day among the African tribes and, perhaps, with the Indians of our own continent.

One peculiar and interesting signal contrivance of the Greeks, because of its equal efficiency for operating in any sort of country, merits a brief description. Two earthen vessels, identical in shape and size, provided with valves that would discharge an equal quantity of water from each vessel in precisely the same period, were placed at the two communicating stations. A piece of cork, floating on the surface of the water supported an upright blade of wood, on which were marked certain sentences; and the upright in one vessel was a duplicate of the one in the other vessel. It was scaled, and the sentences were inscribed within the various divisions. The flash of a lighted torch, which signified the wish to communicate, was answered by another, intimating that the receiver was ready. When the sender of the message extinguished his torch the valve in each vessel was opened, and it so remained until the sender relighted his torch, when the valve was instantly closed. Thus, by careful manipulation of the valve at each point, the same amount of water was run out and the sinking of the upright would be precisely the same in both vessels. The sentence on the division of the up-

right on a level with the mouth of the vessel was the one the receiver would read, and thus obtain the necessary order or information.

So, by the means of fire, torch, shield, or flag, did the ancients communicate their news over long distances; and before the practical introduction of the electric telegraph there were many systems of visual signaling invented by the ingenious. Kepler, about 1600, in his "Concealed Arts," devised the plan of cutting out letters in the bottoms of casks, with a light inside the cask to make the letters luminous. Bishop Wilkins proposed a method of long-distance communication by means of two lights at the ends of long poles, which should be waved from side to side, to indicate certain letters, and suggested that the eye of the observer be assisted by the then newly-invented telescope.

A variety of systems were brought out in the seventeenth and eighteenth centuries, one of the best being that of Dr. Robert Hooke, whose attention had been directed to the necessity of quick communication at the siege of Vienna by the Turks, in 1684. The system consisted of twenty-four symbols, representing alphabetic characters, and six more were used as arbitrary signs. These were to be exposed in succession, hoisted by pulleys to a cross-beam connected to three high poles having a sky-line background on some conspicuous elevation, and being observed at a distant station they would be repeated and thence sent forward to the next. The letters were run into place in the required order of spelling, and the day symbols used were blocks of pine, with the addition of lights for night use.

Mr. Edgeworth, the father of the Irish authoress, Maria Edgeworth, used the sails of a common windmill, in 1767, for communicating intelligence; he called it the "Telegraph." The signals were made to represent numbers, the meaning of which was found in a dictionary where the words were numbered; and this system remained in vogue, for almost all military operations, until substituted by what is known as the Morse alphabet.

Perhaps the most perfect of the early machines for visual communication was the invention of the Frenchman, M. Chappe, in 1702, when the arts of war were fostered by the fathers of the French Revolution; and the method, being generally adopted, has continued in use, with improvements of minor importance.

It is not a little strange that the Italian historian, Strada, in 1617, very curiously indicated the system of modern telegraphy. He wrote: "By the help of a certain loadstone, which had such virtue in it that if it touched two several needles, when one of the needles so touched began to move, the other, though at ever so great a distance, moved at the same time and in the same manner. Two friends, being each of them possessed of one of these needles, made a kind of dial-plate, inscribing it with the four-and-twenty letters in the same

manner as the hours of the day are marked upon the ordinary dial-plate. They then fixed one of the needles on each of these plates in such a manner that it could move round without impediment so as to touch any of the four-and-twenty letters. . . . Accordingly, when they were some hundred miles asunder, each of them shut himself up in his closet, and immediately cast his eye upon the dial-plate. If he had a mind to write anything to his friend, he directed his needle to every letter that formed the words which he had occasion for, making a little pause at the end of every word or sentence to avoid confusion. The friend, in the meanwhile, saw his own sympathetic needle moving of itself to every letter which that of his correspondent pointed at. By this means they talked together across a whole continent, and conveyed their thoughts to one another in an instant over cities or mountains, seas or deserts."

In "Hakewell's Apology," printed at Oxford, 1639, the electric telegraph is prophesied in a marvelous manner; and Charles Marshall, a doctor of Renfrew, in a communication to the Scots Magazine, February, 1753, suggested the possible application of electricity to the purposes of the telegraph. In 1796, the British Government set up lines of communication from the Admiralty, in London, to different seaports of the kingdom, and announced "that one day last week information was conveyed from Dover to London (sixty-six miles) in the space of only seven minutes." John Boaz, of Glasgow, in 1800, obtained a patent for a system of signal telegraphy, with twenty-five lamps, arranged five in a row to form a square, and means were contrived to obscure letters not wanted in forming a desired word.

We pause on the threshold of the nineteenth century. The word telegraph, which is from the Greek, means "far-off writing;" and the realization of its true significance was dawning in the minds of men. Morse and Wheatstone were soon to astound the world by their discoveries. But the crude telegraphic methods of the ancient warriors and citizens are none the less worthy of admiring inspection in these late days, because the spark of electricity almost governs and arranges the work of the world.—Carlton's Magazine.

"Modern Practice of the Electric Telegraph" maintains its value as an excellent technical handbook for electricians, for telegraph managers and for operators. The fact that numerous editions of the book have been issued proclaims its intrinsic worth. The author, the late Franklin Leonard Pope, was a former president of the American Institute of Electrical Engineers, a member of the Institution of Electrical Engineers of London, an old-time telegrapher, and a writer of marked ability. The volume embraces 234 pages, has 185 illustrations and is fully indexed. Price, \$1.50, postpaid. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

The articles under the standing head of "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.

Increase of the Signal Service Force.

Army officers, especially those stationed in and about New York, are interested in a bill providing for the doubling of the signal service corps of the army, which will come up soon before the Committee on Military Affairs of the House of Representatives.

This corps now includes 1,212 men, exclusive of officers, less than one and one-quarter per cent. of the permitted strength of the army. With the development of signal service work, the introduction of modern methods of warfare, and with the territorial acquisitions, the chief signal service officer has found it more and more difficult to carry on the work required of the corps and to keep abreast of the times with the small number of men.

General Allen, the chief signal service officer, stated in his annual report last year that the minimum number of men necessary for this branch of the service was approximately two and one-half per cent of the permitted strength of the army, or about 2,500 men.

Methods of modern warfare, army officers agree, make military research work a practical necessity. They cite the fact that the old methods of transmitting information on the field have been reinforced by such new means as the wireless telegraph, the telephone, the army balloon and, to an experimental extent, the airship.

"In the battle of Moukden in the Russian-Japanese War," said an officer, "the third division of the Japanese army laid one hundred and fifty miles of telegraph lines. The German army has already perfected an army balloon which can be counted on to be of service in time of war, and it has also invented a balloon gun as a defense against the army balloon if used by the enemy. Unless our army can spare men for experimental work it seems almost inevitable that we will fall behind in the development of modern signal service methods."

The signal service bill provides that the signal corps of the army shall consist of a chief signal officer, with the rank of brigadier-general, 4 colonels, 4 lieutenant-colonels, 12 majors, 36 captains, 36 first lieutenants, 36 second lieutenants, 100 master signal electricians, 300 first-class sergeants, 300 sergeants, 300 corporals, 1,200 first-class privates, 300 privates, 60 cooks, 48 farriers and blacksmiths, 24 saddlers, 24 wagoners, 48 trumpeters and a band.

This measure was proposed during the closing days of the last Congress, and Judge Taft, who was then Secretary of War, said in a letter to the chairman of the Committee on Military Affairs, "It is recommended that this bill receive favorable consideration."

Lieutenant-General Arthur MacArthur in a letter to the Secretary of War said:

"In order to provide adequately for the duties and the supplementary duties of the signal corps and at the same time to secure an effective military organization adapted to the necessities of a field army of 100,000 men, the signal corps must be

largely increased. And this increase must be made in view of the fact that the service of military lines of information is special and exclusive and cannot be performed by organizations extemporized after war has become imminent or, as is more likely, actually declared.

It is, therefore, essential to attach to the regular establishment a corps of sufficient size to meet all the immediate demands which would attend the mobilization of a large army. Three thousand enlisted men is the minimum number suitable for this purpose.

Obituary.

George V. Rand, an operator, of Wolfville, N. S., died on November 30.

Charles T. Hawley, a telegraph operator of Cambridge, N. Y., died at that place on November 17.

Brandie H. Rosson, an employe of the Western Union Telegraph Company, died at No. Augusta, S. C., on November 11.

Fred E. Coon, aged thirty-five years, employed by the Western Union Telegraph Company at Syracuse, N. Y., died on November 12.

W. S. Spencer, aged forty-three years, of Salt Lake City, Utah, a well-known member of the telegraph profession, died at El Paso, Tex., on November 18.

Alfred L. Kenney, aged thirty-four years, manager of the Postal Telegraph-Cable Company at Helena, Mont., for the past four years, died of consumption on November 24. Previous to his going to Helena he was a member of the Washington, D. C., force, which place he left in the hope of benefiting his health in Montana. He was an expert telegrapher, and well known in the East.

James H. Arnott, who established in 1863 the telegraph office at Binghamton, N. Y., for the New York, Albany and Buffalo Telegraph Company, and who after its merger with the Western Union Telegraph Company until his forced retirement because of ill health, five years ago, retained the managership, died at that place on November 29. He was sixty-three years of age. Mr. Arnott was at one time superintendent of the fire alarm telegraph system of Binghamton, and for forty years was intimately connected with the fire organization of that city.

Peter J. McKeever, night chief operator of the Western Union Telegraph Company at Pittsburg, Pa., and one of the best known telegraphers in that section of the country, died on November 28, after a few hours' illness. He was sixty years of age, and was a regular attendant at the reunions of the Old-Time Telegraphers' and Historical Association. Almost his entire career was spent in the Pittsburg office, where he was the oldest operator in point of service. He had a premonition that when he left his place of business the day he was taken sick that he would not recover and made all preparations for death.

LETTERS FROM OUR AGENTS.**PHILADELPHIA, POSTAL.**

Race suicide is not likely to occur in the Quaker City, at least so far as the ranks of the Postal service is concerned. The evidence is shown in the following: A boy was born to Mr. and Mrs. Moe Frankel on September 17; a girl to Mr. and Mrs. Harry Bell, on September 25; a boy to Mr. and Mrs. M. A. Auerbach, on October 1; while on the consecutive days of October 14, 15 and 16, boys were presented to Mr. and Mrs. Walter Ray, Mr. and Mrs. Joseph Beasley and Mr. and Mrs. John J. Jeffreys. Verily, a goodly number for a single operating room!!!

On Saturday, November 28, the Army-Navy annual football game was played at Franklin Field. This event always creates a great volume of business. On this day the matter was handled by Manager McNichol, in charge, assisted by Mr. E. W. Miller, chief operator, and the following staff: Messrs. Frankel, Price, Beaseley, Murphy, Mason, Auerbach, Ray, Steltz, Goldberg, Zecher, Lawrence, McLaughlin, Balmer, Fitzgerald and Myers.

DALLAS, TEX., WESTERN UNION.

W. B. Kendall was installed here as manager on December 1, vice G. C. Felton, transferred to Laredo, Texas.

E. C. Davis has returned from a thirty-days' trip to San Francisco and is enthusiastic in his praise of that office. Going westward he took the southern route via El Paso, returning by way of Salt Lake, Pueblo and Trinidad. At Salt Lake Mr. Davis had a brief visit with Manager A. W. Long.

This office is having an overhead carrier system installed, for the purpose of distributing messages, thus minimizing delay in the office. A. G. McGalin, wire chief, is supervising the work.

All of the principal branch offices of Fort Worth are now handling their business direct with Dallas, thus saving the need of relaying at the local main office.

It is pleasing to note the return of "good old times" as shown by the number of messages handled during November, which ran well ahead of business done for several years past.

A relay just returned to Superintendent J. C. Smith's office for repairs has been in service since 1877. Manager A. B. Cunningham, of Longview, Texas, who returned the relay, made this notation thereon: "On one wire and has worked faithfully every day since 1881, when it was installed (second hand, even then)." The relay will be repaired and returned.

J. B. Hardy has charge of the telegraph interests of the "News," vice J. T. Patton, transferred to the new Cotton Exchange, as manager.

C. M. Shelby, of The Associated Press, has charge of the entire Texas and Mississippi circuit.

George R. Hutton has resigned to accept a position as wire chief in a telephone office in Kansas City, Mo.

DULUTH, MINN., WESTERN UNION.

Mr. F. E. Smith, night chief operator, has been promoted to the position of chief operator vice F. L. Patterson, who has taken the place vacated by Mr. Smith, making the change in order to give his attention days to other work.

A. H. Fetzner, formerly night delivery clerk at St. Paul and later chief bookkeeper at Boston, has been assigned to the position of assistant manager.

This company has been doing extensive work in St. Louis bay, between Duluth and Superior, in dredging out a trench across the bay to receive a fifty pair rubber-covered marine cable. The present cable, which simply lies on the bottom of the bay, is continually broken by boats dragging their anchors.

Manager Crane has lately succeeded in uniforming the messenger force at the main and Board of Trade offices, and is justly proud of the neat appearance of his delivery force.

Notwithstanding the fact that navigation and mining operations were discontinued here at least two weeks earlier than usual, business has been very good at this office and held well over last year as to number of messages handled.

On account of the prospects of an early closing of navigation and the unusual dullness in these circles, the Duluth-Cleveland navigation circuit was discontinued somewhat earlier than formerly.

NEW YORK, WESTERN UNION.

Patrick C. Cusick, formerly manager at Oswego, N. Y., and later employed in this department and an old-timer in the telegraph business, died on December 7 in Bellevue Hospital, New York City.

Charles W. Hanson, the assistant gallery chief, who was ill for a short time, died at his late residence, Bayonne, N. J., Saturday, November 28. Mr. Hanson was one of the veteran employes of this department and his death was a shock to a host of friends.

May Dolan, formerly of the eastern division, was married on November 15 to H. Dutton, president of the Colorado Mining Company, and now resides at Oakdale, Long Island.

NEW YORK, POSTAL.

Mr. C. W. Harmon, manager of the 45 Broadway office, owing to ill health, has resigned and is rusticated at Hagerstown, Md., his home, where he hopes to be benefited by a long rest. J. F. Shugrue has been transferred from the 83 Gold street office to fill Mr. Harmon's place. W. Scrivens, of the 853 Broadway office, succeeds Mr. Shugrue as manager of the Gold street office. He in turn is succeeded by C. A. Francis, from the 127 Duane street office. L. P. Kearsley, chief operator at the 45 Broadway office, succeeds Mr. Francis as manager of the 127 Duane street office.

OTHER NEW YORK NEWS.

The printed Proceedings of the forty-second

annual meeting of the Telegraphers' Mutual Benefit Association, held in New York on November 18, made its appearance on December 1, the promptness with which the edition was brought out being creditable to its compiler, M. J. O'Leary, the secretary of the association. A reading of the several reports contained in the pamphlet—those of the president, the secretary, the treasurer and that of the auditing committee—presents a large amount of interesting detail of facts and figures, revealing clearly the evidences of wise and conservative management of the association's affairs, impressive as showing the soundness and strong integrity of this sterling old concern.

Joseph Van Cura of the Anglo-American Telegraph Company, New York, is ill at his home in The Bronx, with pneumonia.

Assessments Nos. 485 and 486 have been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of David E. Maxwell, at Gainesville, Ga.; Joseph Cook, at Muskegon Heights, Mich.; Albert Hayward, at Cincinnati, O.; Thomas F. Ryan, at Roxbury, Mass.; Lewis H. Morrell, at Indianapolis, Ind.; Frank P. Marshall, at Conneaut, O.; James J. Kelly, at New York; Fred E. Coon, at Syracuse, N. Y.; Brandie H. Rosson, at North Augusta, S C, and Harry Grime, at Toledo, O.

Miss A. A. Larkin, for many years chief operator of the Western Union Telegraph Company, at Bridgeport, Conn., was married on November 10, to E. S. Phillips, of that city, which will be the future residence of the couple.

People's Mutual Telegraph Company.

The People's Mutual Telegraph Company, promoted and organized by Board of Trade operators in Chicago, St. Louis and Kansas City, have requested the City Council of Chicago for an ordinance granting it the right to negotiate contracts with the Metropolitan Elevated Company for stringing telegraph wires on its structure. They plan to reach the city limits of Chicago via the Metropolitan to Douglas Park. A line has been built from there to Joliet. From Joliet to St. Louis and Kansas City arrangements for wire service have been made with independent telephone companies.

The promoters of the new company are W. S. Jackson of Chicago, formerly president of the Chicago Board of Trade, and Arnold Kolman of St. Paul and a large stockholder in independent telephone companies. The tolls to be charged by the new company, Mr. Jackson said, are twenty-five cents for ten words or less between Chicago and St. Louis and thirty cents for ten words or less between Chicago and Kansas City, with two cents additional for each extra word.

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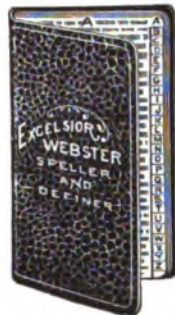
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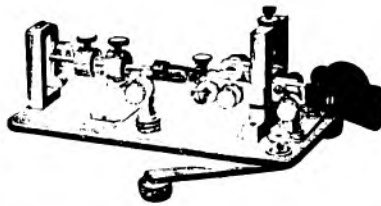
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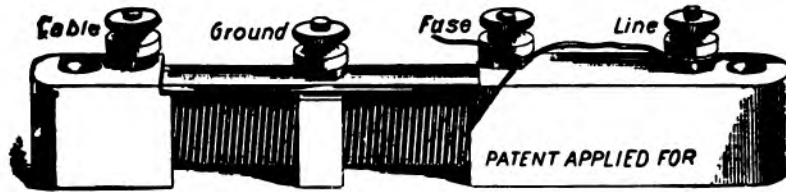
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