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No. 9.

NEW YORK, MAY 1, 1908.

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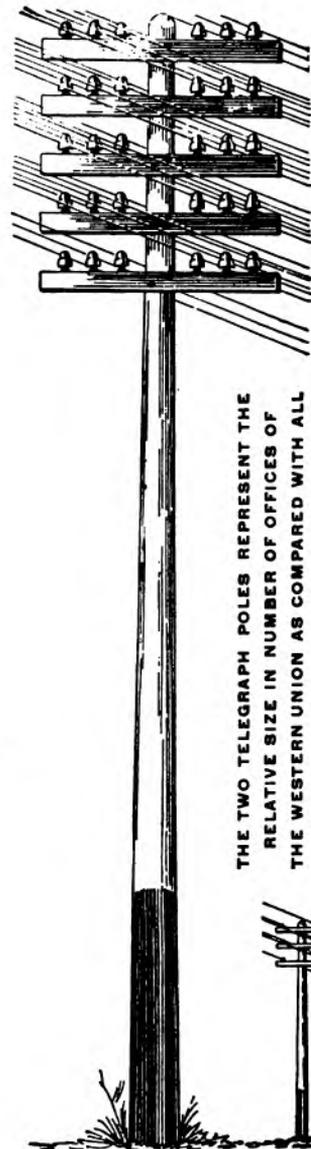
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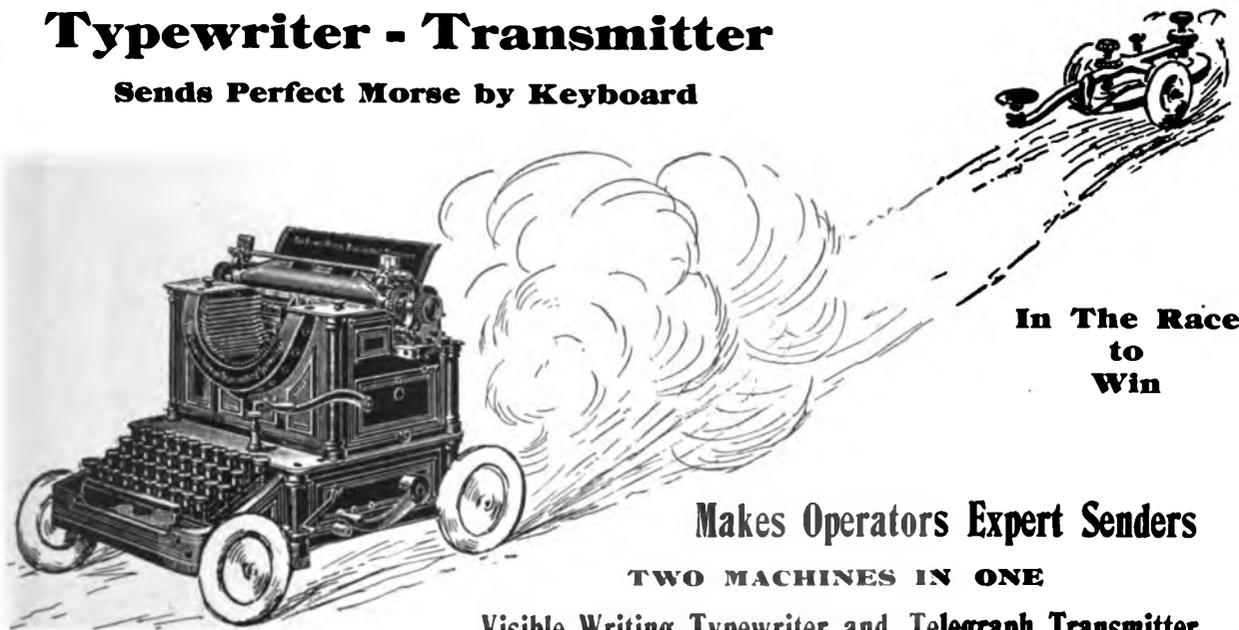
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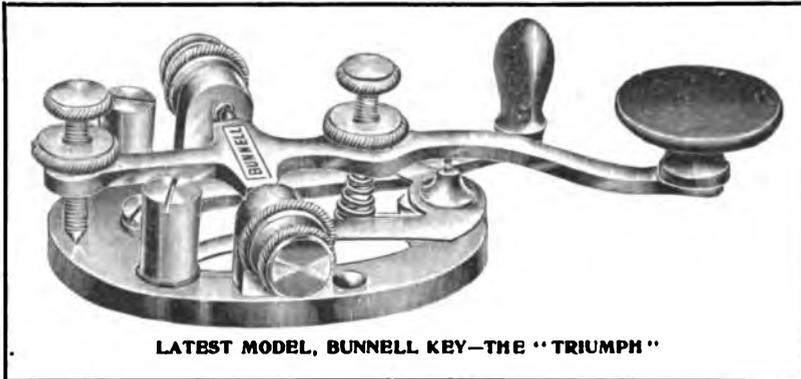
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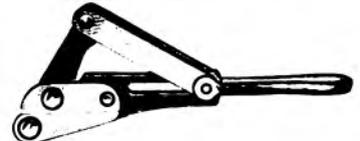
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No. 9.

NEW YORK, MAY 1, 1908.

Twenty-fifth Year.

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SOME POINTS ON ELECTRICITY.

The Polar Relay—Its Theoretical and Actual Construction.

BY WILLIS H. JONES.

A correspondent suggests a subject that may be of interest to other readers of this journal, hence the reply will be in the form of an "open letter." He writes:

It appears that in the Siemens or old-style polar relay, the armature is poised on one end of the permanent horseshoe magnet, and that the field or electro-magnets are poised on the other end, a part of this latter end acting also as a helix for the two electro-magnets. It seems that in the Barclay pattern the two field magnets have no helix and that the two ends of the horseshoe magnet are brought around and lie in close proximity to the two pieces of iron on either end of the armature axis. It is our understanding that the absence of a helix in the latter type of relay is compensated for by the fact that there are four pole-pieces instead of two, that the pull exerted on the armature is therefore greater and that the magnets are quicker in their action. Further, we assume that the modified arrangement of the horseshoe magnet is made necessary because it is required that the armature have two poles, one at each end of its axis. Are we correct?

The main object of using a polarized relay is to enable us to work long telegraph circuits successfully where a neutral or nonpolarized instrument would be ineffectual. The construction, therefore, of such a relay must naturally follow a thoroughly scientific process. Problems have

to be met and overcome to give results that are both practical and effective.

There are two powerful elements to be taken into very serious consideration, namely, hysteresis and self-induction. The former is that peculiar property of iron which after having been subjected to a magnetic treatment tends to retard its rapid restoration to a normal condition. This trait is particularly aggravated when the magnetic circuit is nearly closed, as is instanced by the fact that when an armature is in actual contact across the magnet poles a very high per-

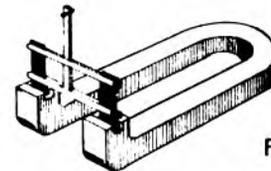


Fig. A

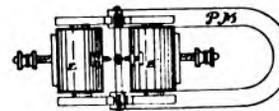


Fig. B

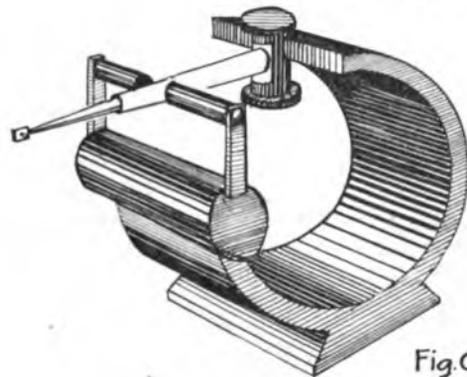


Fig. C

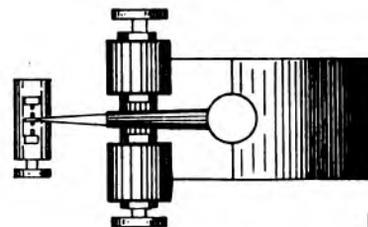


Fig. D

centage of the magnetism remains after the current is taken off. Its effects may be materially reduced by the intervention of an airgap and a reduction in the mass of the metal itself.

Self-induction is that property of an electric current which, while the latter is passing around the helix, tends to induce in each contiguous layer of wire in the coil a current which retards the rise of magnetism, just as though the resistance in the coil was, in some way, being in-

creased; and when the current falls it acts in just the opposite manner. These conditions are met and minimized by removing the yoke and maintaining an airgap, as to hysteresis, while self-induction is nearly cut out by joining the coils in multiples, thus also reducing the time constant.

In the old style camel-back, or Siemens pattern of relay, shown in Figs. C and D of the accompanying illustration, a powerful steel magnet is used having on one end a cross-piece of soft iron carrying the coils or helices. On the other end of this magnet there is extended a tube or flat piece of iron, the remote end of which plays between the pole-pieces of the two relay coils. The cores and pole-pieces are of the best soft iron, and are carefully annealed, all work in their construction being completed before that operation takes place because it has been found that if such cores are hammered, filed, or in any way subjected to injury the best results are not obtained.

Now, in this type of relay, the end of the tubular armature on the permanent horseshoe-shaped magnet is pivoted in such a way as to be free of actual contact with the latter; that is to say, it is pivoted in a brass setting, which latter being non-magnetic by nature, creates the equivalent of an airgap in size equal to the dimensions of the space the setting occupies. The brass, of course, naturally weakens the power of the steel magnet, but it seems to be helpful in permitting a freer movement of the armature than would be possible were the armature and the magnet made continuous by pivoting with an iron or steel setting. The armature is magnetized inductively across the brass setting in a degree sufficient for the purpose desired.

On the other terminal of the permanent magnet, the yoke with the cores form one and the same part of that end of the horseshoe, each core having the same polarity. The lever end of the armature, having, of course, the same polarity as that of the end of the permanent magnet to which it is attached, will naturally cling to either side of the contact points when no line current flows through the coils. When, however, a current does flow, the permanent induced effect in one of the coil cores will be neutralized and the other intensified and thus move the armature as desired.

It is claimed by some that while this style of relay is very efficient it is not quite so well adapted for rapid work as the present flat or Barclay pattern, Figs. A and B, referred to by our correspondent, owing to its construction not being so well adapted as the latter to antagonize the operation of the retarding influences mentioned.

In the Barclay relay there is no yoke or heel-piece to join the two spools together. The cores are milled out of a solid piece of soft iron and in the process of construction the ends or pole extension pieces are left on, thus forming one homogenous piece. They are then drilled at the ends for screws and entirely completed before

being placed in a charcoal fire to be carefully annealed.

The spools are wound with wire in parallel, in some cases; that is, two wires at the same time, and in others in sections. If carefully done the former method is probably the better, but the latter is safer inasmuch as the tendency of the current to jump from one wire to the other is thereby avoided.

The spools are wound to a resistance in each wire of 200 ohms, making 400 ohms for the complete coil. Number 36 single silk-covered wire is used and it requires approximately 928 feet of this gauge for each coil. The variation in the resistances of the two wires should not be more than one per cent. when properly wound. Frequently it is less.

For an automatic or multiplex system where speed is the chief requirement the style of the relay construction is somewhat different, the coils and armature being placed in a vertical position and the moving parts all more delicately constructed, but in other respects the general principle involved is similar to the horizontally fixed coils and armature of the regular pattern.

This relay, generally known as the "Wheatstone" relay, is probably the most perfect form of relay made. The pivot of the vertical armature axis rests on one end, thus reducing the mechanical inertia to a minimum. The coils in this pattern are also longer, and are wound to 300 ohms in each coil, making 600 ohms for both, but they are joined up in multiple, thereby reducing the resistance one-fourth and the time constant to so low a point that the relay responds to a very high speed.

In both of these standard patterns of relay there are four poles and two armatures, the latter on a common shaft, and placed in such a manner that their lower ends are under the control of the permanent steel magnet (see Figs. A and B). As soon as the line current traverses the coils there are two poles repelling and two attracting, but as there are also four airgaps in the magnetic circuit against two in the Siemens pattern, it is hardly probable that the object of such construction is for the purpose of getting the magnetic co-operation of four poles, as suggested, but rather to minimize harmful influences more pronounced in other types.

Recent Telegraph Patents.

A patent, No. 883,723, for electric transmission of intelligence, has been granted to Isidor Kitsee, of Philadelphia. Relates to telegraph and telephone signaling in proximity to a power circuit having inductance effects. Makes use of a special return conductor for the power circuit connected through condensers with the telephone wires so as to neutralize the induction effects therein.

A patent, No. 883,724, for electric transmission of intelligence, has been issued to Isidor Kitsee, of Philadelphia. Relates to modifications of the preceding.

A patent, No. 884,381, for a telegraph transmitter, has been awarded to Mark S. Haling, of Weaver, Minn. Transmitter of the type making use of two keys fulcrumed on vertical axes and which operate to transmit dots and dashes successively in a continuous succession as long as depressed.

The following patents have expired:

Patent No. 449,655, for telegraphy, held by F. Anderson, of Peekskill, N. Y.

Patent No. 449,897, for telegraphy, held by R. G. Brown, of Brooklyn, N. Y.

Patent No. 450,228, for printing telegraph, held by P. H. Fisk, of New Richland, Minn.

Patent No. 450,272, for a telegraph relay, held by R. O. Wickes, of Troy, N. Y.

Personal.

Mr. Paul Schanher, son of J. Schanher, manager of the Western Union Telegraph Company at Mount Clemens, Mich., was married April 21, at Staunton, Va. His wedding trip is taking him to numerous places in the East, where he has many friends.

Mr. Charles A. Boynton, of Washington, superintendent of the Southern Division of The Associated Press, has had conferred upon him by the Emperor of Japan, through Ambassador Takahira, the decoration of the fourth class of the Imperial Order of the Rising Sun.

Mr. William A. Porteous, manager of the Postal Telegraph-Cable Company at New Orleans and T. P. Cummings, manager of the Western Union Telegraph Company at the same place, were in Washington recently, whither they were summoned by the Congressional committee to testify in the Lilley case.

Readers of Telegraph Age, and especially the members of the United States Military Telegraph Corps, will be pleased to learn that James E. Pettit, secretary of the corps for many years past, has recovered so far from his recent illness as to be able to resume his position of chief operator in the Chicago office of the Postal Telegraph-Cable Company.

The Electrical Review recently published a picture showing a group of pioneer telephone officials of the American Bell Telephone Company, taken in 1882. These included Theodore N. Vail, Thomas B. Doolittle, O. E. Madden, Robert S. Boyd, Frank B. Knight, Charles R. Truex and J. M. Brown. Of this number Mr. Vail, the first general manager of the early telephone company, and who is now the president of the American Telephone and Telegraph Company, at New York, was a former telegrapher. Thomas B. Doolittle and Frank B. Knight likewise belonged to the telegraphic profession. These last-named gentlemen are still in the telephone business, the former being located at Boston, and the latter at Dallas, Texas.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Mr. Charles H. Murphy, manager of time service of the Eastern division, was in Boston last week on business connected with his department. The extension of the time service in the Eastern division of late has been rapid, the installation of numerous clocks being added to the already large equipment at all points in the service.

William Finn, of the electrical engineer's office, has been confined to his home for some time past, his trouble being due to a carbuncle.

Mr. James McParlan, manager of the marine department, who was recently South on a leave of absence for the benefit of his health, has returned.

The company is installing a storage battery plant in its office at Ashland, Ore.

The income account and balance sheet of the American District Telegraph Company of New Jersey makes this comparative showing:

	Year Dec. 31, 1907.	1906.	1905.
Gross	\$3,017,174	\$2,799,624	\$2,534,698
Expenses	2,304,214	2,083,798	1,842,879
Net	\$712,960	\$715,826	\$691,819
Dividends	396,899	392,951	390,049
Surplus	\$316,061	\$322,875	\$301,770
Prev. surplus	930,509	721,942	55,871

Total surp. . \$1,246,570 \$1,044,817 \$357,641

Since organization the company has expended, chiefly out of earnings and bond money:

For new construction	\$1,211,119
For purchasing stocks and business of other companies	500,961
For franchises and sundry advances	37,881

Total \$1,749,961

The general balance sheet as of December 31, follows:

	Dec. 31, 1907.	1906.
ASSETS.		
Plt., fran., stks., pat., etc.	\$9,653,933	\$9,653,934
Cap. account	1,780,603	1,346,696
Supplies	67,583	69,988
Cash	123,660	135,909
Accts. rec.	37,279	130,902
	\$11,673,058	\$11,337,429
LIABILITIES.		
Capital stock	\$9,925,350	\$9,909,851
P. and L. surplus	1,244,943	930,510
Bonds payable	283,000	272,000
Sundry acct. payable	219,764	225,068
Total	\$11,673,059	\$11,337,429

RESIGNATIONS AND APPOINTMENTS.

Mr. Norman Ringer, manager at Colorado Springs, Colo., has been transferred in the same capacity to El Paso, Tex.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Edward J. Nally, vice-president and general manager of the company, who has returned from an extended business trip in the West, undertaken in the interests of the company, was the recipient on April 8, while at San Francisco, in recognition of the first anniversary of his appointment as general manager, of the following telegram, signed by Clarence H. Mackay, president of the company:

The finance committee wishes me to express its sincere appreciation of the good work you are doing in inspiring the force with the spirit of our company in the way of improving the service and bringing about economies in operation. We are in thorough accord with your management, policy and administration, and I am sending a copy of this telegram to all our superintendents.

Mr. Charles C. Adams, second vice-president of the company, together with F. H. Hollenbeck, of his office, recently returned from a Southern business trip, which covered all points as far as New Orleans. Mr. Hollenbeck accompanied Mr. Adams in the capacity of secretary.

It is of interest to recall the fact that Charles P. Bruch, third vice-president of the company, was elected just twenty years ago, the first president of the Magnetic Club, then just organized. Included among the guests at the first banquet held at that time were the late James D. Reid, the "father of the telegraph," and Erastus Wiman, then president of the Great North Western Telegraph Company.

Mr. H. F. Hawkins, assistant secretary of the company, who accompanied Mr. Nally on his recent Western trip, returned with the latter and is once again at his desk.

Mr. William A. Porteous, manager of the office at New Orleans, was a recent visitor.

Mr. F. H. Austin, chief operator in the Mobile, Ala., office, was married April 15 to Miss Margaret Waddell, formerly of Philadelphia.

The new office of the company at Pittsburg, described at length in the April 1 issue of Telegraph Age, the execution of the plans of which has been conducted mainly under the direction of F. E. d'Humy, of New York, assistant electrical engineer of the company, was occupied on April 25.

The Railroad.

Statistics compiled by the Interstate Commerce Commission, and published by the Railroad Gazette, states the salient fact that there are now a dozen railroads on which the Morse telegraph is no longer supreme in manual block signaling, telephones or electric bells being used.

The convention of the Railway Telegraph Superintendents which will take place during the four days of June 24, 25, 26, and 27, at Montreal, Que., gives promise of being well attended. Many details relative to the convention were published in Telegraph Age, April 1. Any further information that may be required relative to the affair,

may be obtained of P. W. Drew, secretary of the association, and who is the superintendent of telegraph of the Wisconsin Central Railway, Chicago, Ill.

The Canadian Pacific Railroad has installed a telephone circuit between Calgary and Medicine Hat, a distance of one hundred and seventy-eight miles, on two two hundred and ten-pound copper wires, worked duplex between Calgary and Winnipeg, eight hundred and forty miles. This is precisely the come combination as between Montreal and North Bay.

Suit was instituted by the state at Milwaukee against the Chicago, Milwaukee and St. Paul Railway Company to test the eight-hour law passed by the Wisconsin legislature, which, it has been charged, conflicts with the new federal nine-hour law. The case of Edward A. McGrath, station agent at Stowell, employed in the dual capacity of agent and operator, and required to work from 8 A. M. to 8 P. M., was used as a basis for the suit. It was the contention of the attorneys for the railroad company that the state has a right to regulate the hours of railroad employes in the absence of a federal law. As soon, however, as a federal law is passed the state law becomes invalid. In its answer the railroad company declares that but a small proportion of the duties of Station Agent McGrath affected commerce within the state. It held that the state cannot interfere with the hours in which he is employed affecting interstate commerce. It alleges that none of its telegraphers or despatchers have in a period of twelve hours consumed more than one hour in work affecting the movement of intrastate-commerce only. The answer brands the Wisconsin law as class legislation, alleging that all other common carriers are placed in a favored class by its operation. On all points raised by the demurrer the contentions of the state are sustained. The case has been appealed to the Supreme Court and the request made that it be advanced in the calendar in order to insure early adjudication.

The question of moving trains by telephone is gaining wide consideration in this country, as the feasibility of such despatching becomes more and more manifest as the result of trial. While the method is still largely in the experimental stage, yet enough has already been accomplished to demonstrate its apparent entire practicability. So much so is this the case that initiatory movements of this kind are being numerously undertaken. The matter of detail governing such form of despatching has become an interesting subject, and has caused many letters of inquiry relative thereto to be addressed to this journal. In a note received from U. J. Fry, superintendent of telegraph of the Chicago, Milwaukee and St. Paul Railway Company, at Milwaukee, Wis., on this subject, he writes: "We are moving trains by telephone only in a small way as yet. We are now arranging to equip two divisions, one of

eighty-five miles, extending from Chicago to Milwaukee, and another, of one hundred and thirty-eight miles, from Chicago to Savanna, on which trains will be moved by telephone, in precisely the same manner as is being done by the Chicago, Burlington and Quincy Railroad Company. These systems will not go into service for perhaps thirty to forty-five days. All orders, when received by conductors, are written on blank forms prepared for that purpose. In fact, the orders are handled as nearly as possible in our regular way, except that they are handled by telephone."

The Burlington method of train despatching, referred to is described by W. W. Ryder, of Chicago, superintendent of telegraph of the Chicago, Burlington and Quincy Railroad Company, as follows:

"In handling train orders by telephone, the same general methods are observed as with the telegraph, except that the despatcher instead of sending the order and then copying it in the order book on the first repetition, now copies the order in the book as he talks it off. He thus gauges his speed of conversation to his ability to write, so preventing the operators being crowded beyond their ability to make clean legible copies. All figures in the body of the order are spelled out, as for instance, 'Engine 1124—one, one, two four,' and on single-track installations, the names of the towns are also spelled out as well. The operators in repeating the orders observe the same rules as regards spelling out of figures and names. At unimportant stations, particularly at night, where we do not have business enough to warrant keeping an operator on duty, we arrange a set of telephone instruments so that the train conductor can, if necessary, communicate direct with the despatcher and can get an order covering further movement of his train if desirable. When this is done he follows the same methods as do the operators, and in every case a written copy of the train order is in the hands of the train conductor and engineer."

The Cable.

Cable communication is interrupted April 27, with:

Venezuela	Jan. 12, 1906.
Hayti	Jan. 18, 1908.

All offices closed to International traffic except Cape Hayti, Mole St. Nicholas and Port au Prince.

Madura Island (Dutch East Indies) Feb. 3, 1908

Considerable trouble is being caused to the Alaska telegraph cable by earthquakes and volcanic disturbances. The cable steamer Burnside has recently discovered two breaks north of Sitka, within a few miles of each other. The damage to the cable between Valdez and Sitka is greater than was at first supposed. A new and active volcano is reported in the vicinity of Valdez. In repairing some of the breaks near Valdez the ends of the cable were found to be buried deep in the volcanic overflow.

Daniel Morrison, formerly of the Canso, N. S., station of the Commercial Cable Company, but for the past five years with the Commercial Pacific Cable Company at Midway Island, is spending a vacation in New York, and will leave shortly for Scotland. It is probable that on his return to this country he will go back again to the Midway station. It is a notable fact that during the first five years of the existence of the Commercial Pacific cable, which was opened for traffic in April, 1903, no serious mishaps have befallen any employe at the several stations of the company, whether at Manila, Guam, Midway, or Honolulu.

The English Underground Telegraph.

In the way of immunity from breakdown and interruption of telegraphic and telephonic communication, great things have been prophesied for the system of underground cables, says Electricity of London, which the post office is gradually introducing between the more important towns to take the place of the overhead lines, which suffer such widespread damage with every storm which passes over these islands. If report speak truly, however, the underground cable is itself not so absolutely immune from breakdown or damage as one might have anticipated, or it may be that the department is passing through an unlucky phase of its experience with buried conductors. Only the other week a post office cable breakdown was reported from Scotland; and now it is noted that the new cable laid for the department between Exeter and Taunton has been condemned.

Then, again, there is the extraordinary affair at Conway, in which a cable, containing the underground trunk wires from Valentia and Holyhead to London, was disconnected by a corporation workman. According to the post-master-general's report it seems that in process of excavation a post office joint-box was exposed by the corporation gang, whose foreman—with-out communicating with the local post office officials—took it upon himself to dig up the box, and cut away the lead covered cable on either side. It is alleged that this proceeding was carried out on the strength of information furnished by a passer-by, to the effect that the cable had been abandoned by the post office. As may be imagined, much difficulty and loss of time and revenue were experienced in effecting the necessary repairs, the cable consisting of some twenty-seven conductors. The incident serves to illustrate the importance of preparing and maintaining an accurate map showing the position of all underground mains, telegraph and telephone wires, and such like, in any populous center, and, further, of ensuring a proper study of that portion of such a map relating to a particular district before workmen of any kind are permitted to break ground.

This is a good time to begin a subscription to Telegraph Age, \$1.50 a year.

Radio-Telegraphy.

Patents Nos. 884,070 and 884,071, for space telegraphy, have been awarded to Sewall Cabot, of Brookline, Mass.

A patent, No. 884,076, for space telegraphy, has been issued to Ernest R. Cram, of Cambridge, Mass.

Patents Nos. 884,106 to 884,110, inclusive, for space telegraphy, have been taken out by John S. Stone of Cambridge, Mass.

Patents Nos. 884,986, 884,987 and 884,989, for wireless telegraphy, have been granted to Guglielmo Marconi, of London, England, assignor to Marconi Wireless Telegraph Company, of America.

A patent, No. 884,988, for detecting electrical oscillations, has been awarded to Guglielmo Marconi, of London, England, assignor to Marconi Wireless Telegraph Company of America.

From Rome it is reported that preliminary steps have been taken in connection with the establishment of a series of wireless telegraph stations along the Benadir coast. The station at Mogadoxo is to have a range of about 1,800 miles.

Wireless telegraph experts are engaged in constructing near Zlatoust, Russia, an extensive wireless telegraph station with a view to effecting communication between St. Petersburg and Vladivostock, and also between these two points and Kassatoov, the highest point of the Ural mountains, near Zlatoust, where the Russian government's iron and steel works are situated.

The Suez Canal Company has decided in future to include the spaces intended to hold the apparatus of wireless telegraphy and the electric projector of the vessels among the spaces deducted from the gross tonnage as being useful for the maneuver of the vessel, and under reserve of the observation of the maximum total of five per cent. of the gross tonnage.

A London despatch announces still another in addition to the many systems which have been proposed for the wireless control for torpedoes. In this case the inventor is Grendell Matthews, who says that by his system a torpedo can be controlled absolutely up to a distance of seven and a quarter miles, and can be exploded either by concussion or by means of wireless. The same inventor asserts that he has discovered "an electrical wave which cannot be interferred with."

The Poulsen wireless telegraph station, situated at Lyngby, near Copenhagen, Denmark, was recently enlarged, the height of the aerial being increased. This station is in communication with Newcastle, England; Berlin, Germany, and St. Petersburg, Russia. The generating plant consists of a gasoline engine coupled to a ten-kilowatt dynamo, which supplies energy to a single arc-gap. To supply the inert gas, with which the arc is surrounded, a few drops of alcohol are in-

troduced into the arc-chamber every second. This renders the use of a complicated hydrogen generator unnecessary.

The Marconi Wireless Telegraph Company of America has issued a financial statement for the year ended January 31, 1908. This statement shows the following assets and liabilities: Assets—Patents, good will, etc., \$5,491,885; stations and experimental work, \$126,968; apparatus on hand, \$16,853; accounts receivable, \$17,946; cash, \$1,757; treasury stock, \$145,200; furniture and fixtures, \$1,060; organization expenses, salaries, etc., \$422,422. Liabilities—Capital stock, \$6,044,800; Marconi Wireless Telegraph Company of London, \$16,281; accounts payable, \$8,763; notes payable, \$9,600.

At the annual meeting of the Marconi Wireless Telegraph Company of America held in New York on April 21, the following officers were elected: John W. Griggs, of New Jersey, president; Guglielmo Marconi and John Bottomly, the latter general manager, vice-presidents; W. W. Bradfield, treasurer; George S. De Sousa, assistant treasurer. The new executive committee includes the president and vice-presidents and John D. Oppe, James M. Townsend and James W. Pyke. The following were elected directors for five years: John W. Griggs, John D. Oppe, of Montreal, and James M. Townsend, of New York.

A proposal has been made to the Academy of Sciences at Paris by M. de la Grye for giving simultaneous wireless signals at noon and midnight (Greenwich time) to all ships fitted with wireless apparatus. M. Grye points out that the Eiffel Tower wireless station, from a height of about 900 feet, has a zone of communication embracing most of the Mediterranean and part of the Atlantic, and if a great wireless station were erected on the highest point of Teneriffe it would have within its radius the greater part of the world's water surface. The academy has appointed a special commission to examine the possibility of the scheme.

Announcement is made that a new corporation has been formed in Detroit to be known as the Great Lakes Radio Telegraph Company, which will establish over two hundred wireless telegraph stations around the great lakes this summer. According to information the service will be so complete that any interior city or village in Michigan can be in instant touch with any craft which sails the lakes when the new system is installed. Many owners have already placed orders for equipping boats with the wireless attachment that constant communication may be had with the vessels during the entire season. One of the features of the wireless system will be the fact that all vessels will be in constant touch with the weather stations along the coast, issuing them a warning against sudden changes in weather conditions, and especially against dangerous gales.

R. Rüdénburg, says the *Electrical World*, publishes an account of a laboratory investigation into the conditions under which electric waves used in wireless telegraphy are absorbed. His results emphasize the hopelessness of transmitting energy by wireless means in a quantitative manner. The dissipation is enormous even in the best systems. The amount of energy absorbed from a given wave is proportional to the square of its wave length so that there is a rapid increase of efficiency on lengthening the waves. On the other hand, the somewhat surprising conclusion is arrived at that the effective length of the antenna is without any influence upon the proportion of energy absorbed. This, however, appears not to apply rigidly to a single vertical antenna. It does apply to the "umbrella" form of receiving antenna, whose effective length is about half the height, since downward currents along the ribs reduce the radiation from the vertical wire. The author gives some diagrams illustrating the distortion of the wave-train by a receiving antenna. This distortion extends over about twenty-four wave-lengths. The area from which energy is absorbed has a radius equal to about one-fifth of the wave-length.

Obituary.

Harry H. Lee, aged forty-three years, an Associated Press operator, died at Oklahoma City, Okla., on April 4. He was a native of Cassopolis, Mich.

Henry Roswell Heath, aged sixty-three years, a veteran of the Civil War, died in Brooklyn on April 19. He was at one time president of The Peoples District Telegraph Company.

William Heinze, aged fifty years, a Dominion Yukon telegraph operator, temporarily alone in charge of an office situated at the furthestmost north point of the system in the Yukon country, and distant thirty-eight miles from his nearest neighbor, committed suicide on April 2.

Charles H. Stancliff, aged sixty-nine years, formerly and for many years manager of the Western Union Telegraph Company, at Waterbury, Conn., died on April 14. Mr. Stancliff's father was the first manager at Hartford of the old House printing telegraph system, the first telegraph line built through New England.

John Vandercook, aged thirty-four years, president of The United Press Associations, New York, died of appendicitis, in Chicago, April 11. He represented press associations abroad for over five years and was an author of some prominence. Out of respect to his memory the telegraph instruments in all United Press offices throughout its system were silent for a period of fifteen minutes, from 3 o'clock until 3.15 on the afternoon of April 13, the day of the funeral.

The body of Patrick H. Hughes, a telegraph operator in the employ of the Baltimore and Ohio Railroad Company, Baltimore, was found floating in the harbor at that point, April 9, but

whether his death resulted from accident, suicide or murder, is not known. He was fifty-two years of age. He was well known in the South as a commercial, railroad and press operator, and for a number of years was manager of the Postal Telegraph-Cable Company at Raleigh, N. C., at Savannah, Ga., and at other points.

William A. Case, fifty-two years of age, a prominent telegrapher of Pittsburg, employed in a broker's office in that city, died April 14, of pneumonia. He was born at West Newton, Pa., Oct. 21, 1855. He was well known in the profession throughout the country, by reason of his regular attendance at the annual meetings of the Old Time Telegraphers' and Historical Association, at which he was invariably accompanied by his wife and daughter, who survive him. He had been a resident of Pittsburg for thirty-one years, five of which were associated with the Pittsburg Post, two as manager at the Oil Exchange, ten with the Western Union Telegraph Company, while he had filled his late position for fifteen years.

The Value of Local Rural Telephony.

On rural telephone lines a number of telephones, sometimes ten or more, are connected with a single wire. Each subscriber has a different ring or "call," and the wires are in use nearly all the time. The uses to which these rural lines are put are almost innumerable. On the rural lines in some states a daily telephone news service has been inaugurated. Twice a day, at noon and 7 o'clock, in response to a given signal, all the farmers on the rural telephone lines pick up the receivers, and the operator at the central office or switching station reads a brief summary of the principal news items of the day, just received by telegraph from market centers. In this way farmers living twenty and thirty miles from the nearest railroad or telegraph station receive the news of the world almost as quickly as dwellers in the great cities.

The idea has proved most popular, and is spreading. In a number of instances the telephone lines have been connected with the school houses. While the news is being received the children are given a recess, after which the teacher imparts to her pupils the news she has just received by telegraphic transmission from every quarter of the globe.

Business Notice.

John A. Hulit and Company, of 418 Kansas avenue, Topeka, Kan., are advertising a telegraph key designed for attachment to typewriter keyboards, to which the attention of readers is directed. This key is intended to replace the long reach back of the machine to break, a mere motion of the finger being all that is required to secure this result. Many of these keys are in use throughout the country, and appear to be giving satisfaction. Mr. Hulit, who himself is an old telegrapher, invites correspondence with his firm.

Press Associations' Annual Meetings.

The newspaper men of the United States holding membership in the several press associations of the country namely, The Associated Press, The American Newspaper Publishers' Association, and the Daily Club, the latter an advertising adjunct of the previous named, this being its first annual assembly, turned out in great number last week to meet in their respective annual conventions in New York.

The Associated Press celebrated its ninth annual meeting behind closed doors at the Waldorf-Astoria, on April 21, Frank B. Noyes, president, in the chair. A report by the directors was submitted in which reference was made to the change of date in holding the annual meeting from the third Wednesday in September to the Tuesday preceding the fourth Thursday in April, as well as to end the fiscal year on December 31 of each year, instead of on June 30, as heretofore, changes determined upon at the last annual meeting held on September 28, 1907. During the six months past, twenty-eight new members joined the association and there were thirty-five resignations and withdrawals.

Melville E. Stone, the general manager, in his report for the six months ended December 31, 1907, the change in the date of the fiscal year causing the report to be made for six months only, announced a net deficit of \$94,708.03. The total number of leased wires extends over nearly 40,000 miles.

The report of the auditing committee showed the total assets to be \$376,614.73. The total gross earnings were \$1,276,670.62.

The total operating expenses were \$1,368,826.48, of which \$146,862.41 was for the foreign news service, \$171,351.44 for salaries and \$57,375.08 for office expenses.

The leased wire service cost \$909,149.24 and the incoming news service, \$62,449.74.

The loss incurred during the six months was almost wholly due to the strike of the telegraph operators. The expenses of the leased wire system was very largely increased for this reason.

There are three hundred and sixty-two morning and four hundred and thirty-eight evening newspapers having franchises in The Associated Press.

The newly elected board of directors met in the main offices of The Associated Press April 22, and re-elected as president Frank B. Noyes, Chicago Record-Herald; first vice-president, Charles Hopkins Clark, Hartford Courant; second vice-president, Rufus N. Rhoades, Birmingham News; secretary, Melville E. Stone; assistant secretary, Charles S. Diehl, of Chicago, and Herman Ridder, New York Staats-Zeitung.

The combination banquet of The Associated Press and of The American Newspaper Publishers' Association was held in the grand ballroom of the Waldorf-Astoria on Wednesday evening, April 22. It was numerously attended and was a brilliant affair. Among the speakers on the occasion was William Jennings Bryan.

United States Military Telegraph Legislation.

Prompted by the perusal of a letter addressed by David Homer Bates, of New York, to Hon. Sereno Payne, House of Representatives, Washington, under date of March 2, and published in Telegraph Age on April 1, respecting national legislation in behalf of recognizing the few remaining members of the United States Military Telegraph Corps to the extent of placing them on the pension roll of the country in equality with the soldiers of the army who fought during the Civil War, Jesse H. Robinson, of Washington, himself a military telegraph veteran, sent the following letter to Mr. Payne on April 8:

Relative to your letter of March 16, 1908, to Mr. D. H. Bates, 658 Broadway, New York, I beg to submit the following facts relative to some of the duties performed by the operators belonging to the United States Military Telegraph Corps during the Civil War, and hope that after reading the same your opinion will change, as did that of the late Senator Orville H. Platt, of Connecticut, who told me shortly before he died that he opposed the bill to pension military telegraph operators for about the same reasons given by you, but after looking into the merits of their claims he was willing to change his former opinions.

After reading General Locke's article relative to his operator, I would say those of us who have participated in active warfare can recall the awful carnage created by concealed explosives, and the terror with which soldiers have advanced over ground mined with torpedoes, and those of us who have not done so may recall incidents where a single individual has rushed through fire and flame, carried out kegs of powder, thinking not of the danger to himself, but of saving the lives and property of others. Such men the world usually classes as heroes worthy of the highest reward and honor.

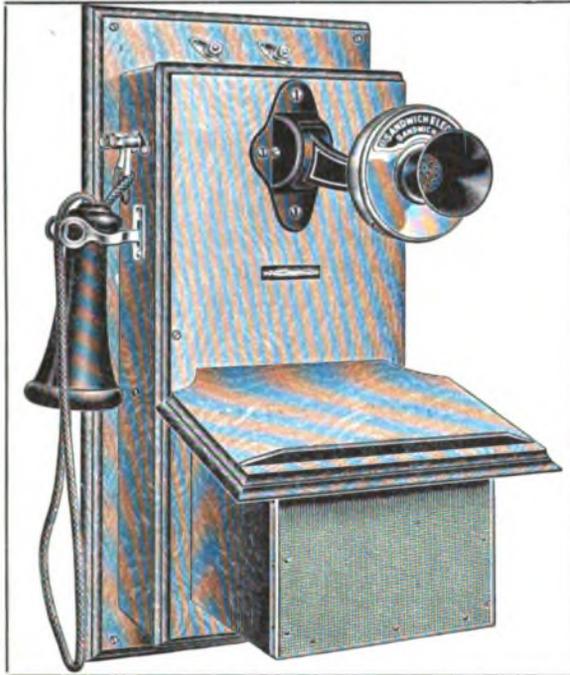
General Locke, in an article in the Century Magazine, says: "When we came to evacuated camps our soldiers in line of battle were halted and the military telegraph operator, on account of his familiarity with electrical wires, was sent in advance of the troops for the purpose of discovering hidden torpedoes, and, if possible, prevent their explosion while our troops were directly over them."

At Yorktown, in 1862, Mr. Lathrop, the military telegraph operator, who was sent by General Locke in advance of his halted troops, was blown to atoms by one of General Magruder's concealed torpedoes. His remains were scraped up and thrown into a pine box and buried on the battle field. In this instance Mr. Lathrop was sacrificed that the lives of hundreds of commissioned and enlisted soldiers might be spared, yet to this date neither his relatives nor the surviving members of the United States Military Telegraph Corps have received any recognition of this act or, indeed, of the many other similar services rendered.

I am satisfied you would prefer to do that which is right, and if you will get and read Senate Report 1927, second session, 58th Congress, to accompany S., 982, your kindness of heart will lead you to see the proper side of this question. Senate 982 of the 58th, Congress unanimously passed the Senate, but was killed in the House.

The municipality of Asbury Park, N. J., is in high dudgeon because the Postal Telegraph-Cable Company refuses to transmit the city messages free of charge, and in consequence a motion has been made in the common council that the franchise of the company in that metropolitan center be revoked.

Railway Composite Apparatus



STATION TELEGRAPHONE NO. 7.

Patent Nos. 831,625
839,210
882,347

Under ordinary conditions this instrument will operate a distance of 100 miles on an iron Morse wire, and twice that distance on copper, and any reasonable number of instruments can be operated on one circuit.

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Our selective calling device for telegraph offices is an entirely new innovation, operating on a reversed current; it is not continually in motion and can be operated only by the dispatcher.

Can be used on both single or metallic circuits.

Will work on the same Morse way wire with no action of mechanical parts excepting when call is being made selectively.

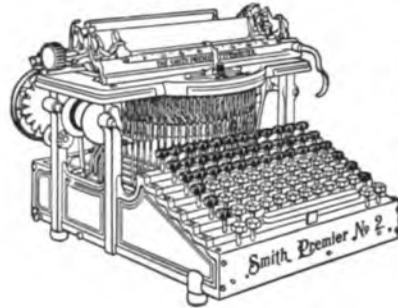
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NEW YORK, MAY 1, 1908.

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 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.

We desire to state that back numbers of this paper, those issued more than six months prior to any current date, will be charged for at the rate of twenty-five cents apiece when they can be furnished. This price is fixed because of the necessarily limited stock we carry, and of the difficulty we have sometimes in filling an order. Oftentimes the request is for papers of a more or less remote date, with the expectancy of being charged at but ten cents a copy, whereas, in order to obtain the desired issue we are ourselves frequently obliged to pay the larger sum named or even more. The growing value of complete files of Telegraph Age should cause our readers to carefully preserve their issues.

A Threatened Strike.

Again, as early in the year, threats of another strike of telegraphers is intimated as likely to occur. In the first instance the menacing utterance appeared to emanate from Chicago, and March 1 was named as a probable date of walk

out; now, an official of the union located here in New York, appears to be sounding the initiative in the matter, and June 1 is set for the time when trouble may be expected. At present the animus of the union, the personnel of which evidently is made up largely of the unemployed, seems to be directed against the Western Union Telegraph Company exclusively, because, as alleged, of a cut made in the salaries of operators, which in due time, according to programme, the company will be called upon to restore, or submit to the retaliatory measure of a strike. It is stated that numerous locals situated in different parts of the country, have already signified their approval of the action contemplated, and that others, soon to vote on the question, will probably also render a decision favorable to the proceeding. Unless a bluff is intended it would seem that a deliberate purpose is being shaped, and that the melancholy experience of last year may be repeated this. If so, this would indicate that the madness that produced one strike is to be responsible for an insane frenzy that would cause another. It is not probable that any wrongs that may exist in the present relations between the telegraph company and its employes can be righted or regulated or mitigated in any way by a strike. This should be so obvious to the union leaders and to all members of the union, as to render any extended argument concerning the utter futility of such a proposition wholly unnecessary. The men who went on strike last year are themselves largely to blame for the conditions affecting labor within the limit of the telegraph. If all sense has not departed from their councils they should at least have some dim perception that this year, of all years, is a pretty bad one to inaugurate a striking propaganda. A yawning chasm of utter oblivion, so far as telegraph employ is concerned, doubtless awaits all who would be foolish enough to identify themselves with so offensive a move as a strike at this time would be regarded by all business interests of this country. No circumstance can excuse the folly and wickedness of such an agitation.

The Importance of Legible Copy.

Is good penmanship a lost art among telegraph operators? The need of producing legible copy in order to guard against mistakes in the telegraph service, is obvious; moreover, the satisfaction to the individual of doing a thing properly should be equally manifest. "Neatness and despatch" may well compound a phrase peculiarly adapted to the telegraph fraternity. Its application indicating a willingness to do things right, in accordance with rule and official desire, as well as a following out of the best there is in traditionary inspiration, would go a long way toward making the position of the operator more consonant with dignity, with devotion to duty, the inherent underlying motives that should be the governing impulses of every ambitious person.

Deterioration in penmanship has come to be a glaring fault in the telegraph office. Many an

elderly operator will produce a chirography, accompanied with proper punctuation, that would put the majority of the younger members of the fraternity to blush. Telegraph operators owe it to themselves, as well as to the profession to which they belong—to the proper observance of the relations they sustain to the telegraph companies and to the public, which, it may be said, they equally serve, to exercise greater care in their handwriting. It is important that they should do so, for carelessness and consequent illegibility in this respect too frequently cause error.

The telegraph companies for years past have found it necessary as a rule to insist upon their operators using the typewriter in receiving messages. The reason for this grew out of the fact that the handwriting in very many of the messages could not be readily or correctly read without more or less study of the faultily constructed letters. While the typewritten message presents a distinct improvement over the defective pen-written telegram, because of its mechanical execution, carelessness of performance is still too plainly the rule rather than the exception in telegraphic work. This is deplorable because it indicates the careless, if not indifferent, mind behind it all.

In a conversation held with an official of one of the telegraph companies a few days ago, the information was furnished that the percentage of illegible copy turned out by operators was remarkably high. He said that his company did not necessarily require its operators to use the typewriter if their writing was legible, but its use was insisted upon by all who were not good penmen. If the individual operator could only be made to realize that success in his chosen occupation was largely dependent upon the faithful attention paid to details, in which the turning out of good copy is by no means the least, he would master one important feature, and relieve himself of much objectionable criticism. All that is necessary to overcome this particular fault is practice. When, for instance, the letter "a" is written, it should be so carefully done as not to puzzle the reader as to whether it might be "o," "u," or "n." Practice alone can make perfect, hence the practice in the formation of each letter should be followed after an acceptable model until words can be written not only rapidly but with strict accuracy. It may not be generally understood, perhaps not believed, but it is a fact nevertheless that it requires no longer time to write letters and words correctly than it does to form them in a slipshod fashion, thus defying their ready interpretation. Errors may frequently be avoided if necessary attention be given to the preparation of legible copy.

This is not a small thing to which Telegraph Age has called attention. It affects the standing of operators in the service far more vitally than many imagine. As was remarked in a previous article, in which this subject was touched upon, some may claim that the turning out of either a

well-written or of a poorly inscribed message is a comparatively small thing. Nothing is small or unimportant that has a tendency to invalidate in any manner the work of the individual, be he an operator or otherwise. If the little things of life are closely looked after and their faults overcome, the larger measures, with broader responsibilities, carrying increased emoluments, to which all should aspire, will be more easily reached because of the self-imposed discipline expended in the fundamentals. A man's vision should extend beyond his daily work.

Control of Common Carriers by the Interstate Commerce Commission.

We have frequently stated that it would be better for the telegraph companies to come under regulation, if, indeed, regulation be deemed necessary, by the United States government, rather than by forty odd individual state legislatures, each eager to administer its own idiosyncratic views of what should constitute such "regulation." Theodore N. Vail, president of the American Telephone and Telegraph Company, evidently recognizing the trend of current public opinion in this matter of regulation, stated recently that he saw no objection to government control of the telephone provided it is "independent, intelligent, considerate, thorough and just, recognizing, as does the Interstate Commerce Commission in its report recently issued, that capital is entitled to its fair return and good management or enterprise to its rewards." So, too, with the telegraph, if control be vested in the Interstate Commerce Commission, such action would tend to simplify and overcome many vexatious questions imposed by too much and too varied legislation on the part of the several states. It is not a difficult matter to deal with one central body of men of broad sympathies and jurisdiction, if imbued with the spirit of justice. It is perplexing, however, for telegraph companies to treat with numerous sets of state commissions, all clamoring to "regulate" the telegraph according to their own peculiar and too often fantastic notions.

Mr. Carnegie, in a recent letter, takes strong ground that the control of common carriers engaged in interstate commerce should be lodged exclusively in the Interstate Commerce Commission. He says: "I cannot too strongly advise against there being more than one authority to pass upon such questions, and that should be the Interstate Commerce Commission. If common carriers be placed under one commission and industrial interstate commerce under the Bureau of Corporations, or another commission, there must arise invidious comparison between the two. Such comparisons will be publicly made. The party denied by the one will be disposed to feel that the other takes more liberal views, and vice versa, and vent his disappointment. Imagine two Supreme Courts! The standing of both courts would be lowered. No reason why the Interstate

Commerce Commission should not deal with the whole subject and every reason why it should. Its members will get a wider view of the whole question in its different phases. It is really one question, not two."

Following out the prompting expressed by the coming into being of the Interstate Commerce Commission, it may be that eventually as a logical sequence—as a measure of equity and protective justice to interstate common carriers, that charters for all such will be conferred by the general government, because of the exercise of a broad continental control, rather than by the decree of an individual state.

Andrew Carnegie's Honor-Pension for Needy Survivors of the United States Military Telegraph Corps.

The January 16 number of *Telegraph Age* contained the correspondence between Mr. Carnegie and the executive committee of the United States Military Telegraph Corps, under the provisions of which an honor-pension of \$144 annually is secured to such of the surviving members of that historic body of men as are now in needy circumstances.

We are informed by Mr. David Homer Bates, of this city, secretary of the executive committee, that up to date the Carnegie relief has been granted to twenty-nine of his comrades, representing about fifteen per cent. of the known survivors. One of the recipients died within a few weeks after receiving his check. Several others are reported to be very old and feeble, so that it is quite unlikely they will be present to answer the roll-call next year when, if living, they would be entitled to receive a second payment.

We wonder if Mr. Carnegie, the "Founder of the Corps," as he was denominated on the famous dinner card at the reunion on March 28, 1907, at the Hotel Manhattan, New York City, has even a faint idea of the great amount of good accomplished by his gracious bounty, not only to the immediate recipients by the relief in their time of pressing need, but also to each member of the corps of his founding by his close identification with that corps in this manner, and the strengthening of the bond of fellowship between its members and their first official head.

Some of the letters of acknowledgement of Mr. Carnegie's pension checks are pathetic; all are profoundly grateful. Their names are recorded in the confidential files of the executive committee and for obvious reasons will not be made public.

Telegraph Age on behalf of all the survivors of the corps, takes this occasion to extend heartfelt thanks to Mr. Carnegie, the "Founder of the Corps."

Mr. Buxton, in reply to Mr. Watt in the English House of Commons recently, said that he "estimated that the annual 'loss' involved by the

system of cheap rates for newspaper telegrams was about £220,000, in return for which the nation enjoyed such advantages as were derived from the dissemination of news at a cheap rate, and he did not propose to charge this class of traffic at the same rate as ordinary telegrams. There would appear to be no 'loss' on this account, but on the contrary a net gain of such an amount as had been netted on this class of traffic, for it is a matter for argument that it would not exist to the full or in part if charged at the higher rate. The 'loss,' therefore, may be considered a 'theoretical,' not an 'actual,' loss as the reply would appear to indicate, as every telegraph system, it may be said in reason, looks upon 'press' as additional revenue. It is transmitted more easily and generally at times when lines are clear or not pressed by ordinary traffic."

And now Rhode Island, small in area but mighty in majesty when seeking to assert its power, would put pressure upon the unfortunate telegraph companies, and by legislative enactment compel them to keep all offices located in towns of 5,000 population, or over, open at all times. As compliance with such a strict measure would not be warranted by the amount of business handled, and as the eight-hour law in that state, as laid down under the proposition, would require three separate operators to maintain the office during the day of twenty-four hours, failure in which, as in certain other observances, would be followed up by the imposition of sundry fines, it is altogether probable that telegraph facilities in Little Rhody, if the impossible be insisted upon, may be narrowed down very materially, so far as the number of offices is concerned.

The annual report of the wire department of the City of Boston, just at hand, affords an excellent insight of what has been accomplished by the operations of that department in the New England metropolis during the year 1907. A series of well-executed illustrations in duplicate show views of street wire conditions both before and after the removal of aerial wires. Boston is evidently making fine progress in improving the appearance of its streets by removing overhead wires to underground conduits. The report, which is embodied in a pamphlet of forty pages, and which is supplemented by a sectional map showing the prescribed district for 1908, has been compiled by James E. Cole, acting commissioner of wires.

In an appeal taken by the Postal Telegraph-Cable Company at Norristown, Pa., recently, on what was termed an exorbitant charge made by the borough of West Conshohocken for the inspection of telegraph poles, the judge handed down an opinion fixing the rate at ten cents a pole. The borough had taxed each pole \$1.

Patent Laws Need Reform.

Urgent representation being made to Congress in behalf of the Harrison bill for the establishment of a central patent court of appeals for the United States brings into prominence, says a contemporary, a big vexed and important issue that has not been given the attention it deserves in legislative deliberation because, probably, of its vexatious nature, and which has not been impressed upon the public mind as being vital because, probably again, of general ignorance, misconception or lack of information regarding its importance.

Everybody knows we have patent laws. Everybody knows, in a vague way, that when an inventor discovers a new idea or mechanism or process, he applies to the government for a patent, and that this patent is supposed to give him a right of monopoly in the profits from its use for a limited term. Behind the idea of granting patent rights and monopolies is a fundamental idea or theory that such a system benefits the public. This theory is that the patent, by giving the inventor a monopoly and not permitting others to use his method, idea or process without paying him for such use, encourages invention, and that the encouragement of invention benefits the public by increasing and multiplying inventions that conduce to the great comfort, happiness and prosperity of the people.

In theory the system is defensible, if not unassailable. In practise, under the patent laws of the United States, the theory is not working well. Ask any honest, experienced patent attorney, and he will tell you very frankly that because of defects in the system our patent laws to-day are so easily evaded or abused that they very often afford little protection to the inventor and frequently do not serve the purpose of benefiting the public.

It occurs so often as to have become almost an axiom that it is not the inventor but some capitalist or promoter who benefits from the patent monopoly. It also occurs, possibly even more frequently, that the granting of patents by the government does not result in giving to the public the benefit of the new invention, but in actually depriving the public of such benefits. The records of the patent office are full of stories of valuable and wonderful inventions for improving methods of manufacture, transportation or communication, which have been bought and pigeon-holed by great trusts or business concerns to get them out of the way and prevent a competition that might seriously injure the older methods and the capital invested in machinery or plant which the new invention, if used, might make obsolete.

Other countries have tried to meet and solve both these problems by changing their patent laws. In some European countries, for instance, patents are required to be "worked" within five years. If the invention patented is not put to use in that time, the patent monopoly is nullified and anybody may make free use of the new idea.

This is intended to protect the public from improper monopoly and disuse of the patent rights. In other countries, too, efforts have been made to protect the inventor without infringing on public interests.

Germany's patent laws differ from those in this country in a vital respect. Understand that before a patent is granted the claims made by the inventor are supposed to have been thoroughly examined by a government expert who goes through all the records, decides whether the idea presented is one deserving of a patent, and determines whether or not it is a really new suggestion, or is simply a repetition in slightly different or identical form, of some idea already patented. This is done in all countries. In Germany, after having thus examined the idea and granted the patent, the government practically assumes the responsibility for the patent. That is, having declared the invention is a proper one to be patented, the government stands behind this opinion and defends the inventor or patentee from infringement. It helps him in case his patent is attacked; it punishes those who infringe his patent, and after a short period of years it makes patent incontestable.

In the United States the government, after granting the patent, leaves the inventor or patentee to fight the thing out for himself. He must fight infringements in the courts without aid from the government. At any time during the life of the patent it is open to attack from anybody who chooses to attack it, and the patentee must defend himself from these attacks without government aid.

Much of the difficulties experienced in efforts to protect inventors and the public under our patent laws lies in the method of court procedure. Other countries have patent courts, with men on the bench thoroughly versed in the patent law, and familiar with patents. In the United States, patent cases are tried before judges in the Federal, District and Circuit courts. These judges are supposed to know patent law and procedure offhand. A patent case involving an important question of ownership or rights in which the decision depends upon some very delicate question of chemical process or some complicated mechanical action or elusive electrical theory, must be tried before a judge who possibly knows nothing of machinery, electricity or chemistry, and the case may be sandwiched in between one concerning railroad rates and another dealing with admiralty law.

It is no exaggeration of present conditions in patent law practice to say that until a patentee has had his right confirmed by the United States Supreme Court or by every Federal Court of Appeals he has no security whatever against continued litigation on any contested ground. If his right is violated in California, for instance, he must sue for infringement there; if he wins in the District Court he must face an appeal. Unless he can secure a general affirmation of his right by the United States Supreme Court, he

may have to sue in each of the nine judicial circuits of the country to defend his rights. He may win in one district and lose another suit, brought on the same grounds, in another district and before another judge. Probably the nearest approach to a central court of patents in the country is the Court of Appeals of the District of Columbia, where about half the docket is made up of patent cases. Because of this large amount of patent business in this court, patent attorneys say, its rulings are usually such as tend to bring the proceeding in the judicial circuits into unfavorable comparison.

A House committee is now conducting hearings on the Harrison bill. There seem to be only two sources of opposition to the central court plan; patent lawyers practicing elsewhere than in Washington, and general practitioners who fear such a court would put a high premium on patent law specialists. The main reason for the failure of Congress to have established such a court before this, and the main cause for present delay and difficulty, seems to be that the lawyers can't agree concerning the details of a bill.

The Electrical Properties of the Atmosphere.

In the study of the electrical properties of the air considerable advance has been made during recent years, but we are still sadly ignorant of the behavior of this element. The subject is interesting not only from the scientific point of view, remarks the Electrical Review, but to engineers, who are looking forward to a decided increase in the voltage of transmission systems, whereby they hope to decrease the cost of construction and at the same time increase the area over which power may be economically distributed.

For a great deal of our knowledge regarding this ever-present mixture of gases we are indebted to Dr. J. J. Thomson, and we have come to expect from time to time further additions by him to this. In a recent lecture before the Royal Institution, of London, he discussed the conduction of electricity through gases, but limited his remarks to one method by which this is brought about; the method, he said, which is so inconspicuous under ordinary conditions that for many years it was not recognized at all. This is the conduction brought about by ionization of the air, itself caused, it is believed, by radioactive substances.

The seemingly erratic behavior of air when employed as a conductor of electricity has been one of the most puzzling electrical phenomena, but this, it is now believed, is fully explained by the recognition of the presence of radium emanation in the air, which brings about a degree of ionization depending upon the quantity of the emanation present, and hence causes the air to act as a conductor in the same proportion.

Another interesting question is to explain how the earth manages to maintain its negative charge if it is surrounded by a conducting atmosphere. The potential gradient in the air is fairly large

and may indeed be as much as one volt per centimeter, which would indicate that the negative charge should be neutralized rapidly by the positive electricity of the air. The fact that this neutralization is going on continuously has been established by C. T. R. Wilson, who found that the rate of neutralization is sufficient to discharge the earth in an hour if the negative charge were not being continuously given back to the earth. How this is done has not yet been explained, but Dr. Thomson thinks that rain plays a large part in it, if it is not, in fact, the sole agent. Drops of water form more easily on negatively charged particles. Rain may be thought of, then, as forming on the negatively charged dust particles, and as it falls to the earth it not only clears the air, but restores to the earth its negative charge.

One of the most surprising features of modern scientific advance is the new light it is shedding on forces and actions which are continuously playing around us, but of which we have had no intimation before. One can but wonder what influences they must exert on every phase of terrestrial life and development.

Advance in Wood Preservation.

"Timber thoroughly treated with proper preservatives will last almost indefinitely," says a government expert who is an authority on wood preservation. "Engineers have known for years that this is true," he continues, "but up to the present time, at least in America, complicated and expensive plants have been necessary for the work and wood preservation has often been too expensive an operation to allow treated timber to come into general use."

Methods in wood preservation have undergone a marked change in the last few years, however, and the work which a few years ago was limited to a few experiments carried on in scattered parts of the United States has grown with such rapidity that wood preservation has become a business which figures most prominently in the industrial life of this country.

Each year users of timber are treating an increasing portion of their supply by bringing preservatives into play to close the pores and prepare the timber they use to resist the fungi which cause decay. The work points the way to one of the chief means of the conservatism of the nation's forest resources, for as the length of the life of timber is increased the drain upon the forests is lessened, and more wood made available for use.

Andrew Carnegie in a recent address said:

"The curse of drink is the cause of more failures in life than anything else. You can surmount every other faulty habit, but the man who is a confirmed drinker has not one chance in a million of success in life. Liquor will conquer you, a million chances to one, if once you give it sway."

Historical Sketch of the Late Hon. William Orton, President of the Western Union Telegraph Company.

BY A. W. ORTON, OF ROME, N. Y.*

The several men who in the past have attained to the presidency of the Western Union Telegraph Company have been men of large executive calibre and of pronounced individualism. Their names are indissolubly woven in the history of the great corporation over which in their day and generation they were called upon to preside. It is instructive and interesting to read the narrative which presents a view of their lives.

The following embodies some personal facts related to the writer by Mr. Orton when he was president of the United States Telegraph Company, in 1865 and 1866, with the company's headquarters in New York City. It was mainly through the personal efforts of Mr. Orton that the United States with other telegraph companies were merged into the Western Union system.

William Orton descended from Thomas Orton, who came to America from England in the year 1636 and settled in Windsor, Conn. William was the oldest son of Horatio W., and was born on a farm about two miles southeast of Cuba, Alleghany County, New York. In his earliest years he made the most of the opportunities of the district schools which he attended, and long before he grew to manhood's estate he engaged in the work of teaching in these schools. He soon found he could increase his efficiency as a teacher by laying a better educational foundation for himself. With that end in view he attended a school in one of the Eastern states, where he met a teacher from whom he gained more knowledge than from all others; he learned from him the secret of how to teach himself. Young Orton entered the State Normal School at Albany, N. Y., under the inspiration of David C. Page, one of the pioneers in the work of normal training, graduating from that institution in 1847, expecting at that time to devote his life to the profession of a teacher. Had he done so he would undoubtedly have been as brilliantly successful in this calling as he afterwards became in other lines of endeavor. He did not, however, teach many years after his graduation. His fine presence and his marked executive ability attracted to the young schoolmaster the attention of business men, and he was soon induced to exchange the vocation of the pedagogue for a position in the publishing house of George Derby and Company, of Geneva, N. Y. Here he advanced rapidly in the esteem of the firm and was early admitted to a partnership in the business. The concern was transferred eventually to New York. The Civil War coming on, the firm met with reverses. For a short time thereafter Mr. Orton was associated with the firm of J. B. Gregory and Company, publishers. Mr. Orton told the writer that the year before his firm met with reverses, just prior to the Civil War period, the profits for the year were fully twenty-five

thousand dollars, while the next year, so disturbed were the times, that the house became hopelessly involved.

After the merger of the telegraph companies, before referred to, had been accomplished, Mr. Orton was presented with several thousand dollars, voted him by the companies for the successful completion of the combination he had been the means of effecting. With this money he discharged the old debts left by the publishing firm, although he was not legally obliged to pay the obligation; with his sense of right of justice and honor he could not feel this money was his to retain.

Soon after reaching New York he began to take an interest in public affairs, and especially in the then newly-formed Republican party, to which he was a staunch adherent all his life. A man of intelligence and force of character, he rose rapidly in public favor and in 1862 was appointed by President Lincoln collector of internal revenue for the most important district in the country, namely, the sixth district of New York, which embraced Wall Street. He showed such efficiency and mastery of the business that his district became the standard of the country, not only in point of magnitude in amount of business handled, but in efficiency of management. At this time a congressional committee desiring information as to the working of the law in internal revenue matters sought enlightenment from the commissioner of internal revenue at Washington and found that he was not able to answer them as to all points; they were advised to send for the collector of the sixth district of New York. The committee summoned William Orton and he showed such thorough knowledge of every point involved that it at once occurred to the members that he was the right man to be at the head of the department in Washington. In the course of a year a vacancy in the commissionership came and Mr. Orton was appointed by President Lincoln to the place in 1865. His administration was efficient and successful in every way.

In Washington Mr. Orton made the acquaintance of the leading men in the country, and the pathway of political preferment seemed open to him, but he was not long permitted to remain in political life. He was prevailed upon to accept the presidency of the United States Telegraph Company. In a short time the consolidation of this organization with its great rival, the Western Union, was brought about, and Mr. Orton was made vice-president of the absorbant company. In 1867 he was elected its president, and to this gigantic corporation and the multitudinous duties it involved he devoted the remainder of his life, withholding no service he could possibly render. The burden of the management of the Western Union Telegraph Company had rested about from the foundation of that corporation on his shoulders. He was neither a practical telegrapher nor a heavy capitalist; he was chosen rather for his efficient executive ability. He was a constant worker; he would devote the usual hours of business to the discussion of details of his office, the night would find him poring over his correspondence, studying up the law cases in which the company was always involved, engaged in consultation to repel assaults

*The author of this sketch is an old-time telegrapher, a member of the United States Military Telegraph Corps, and is a distant connection of the family of William Orton.

in legislature or Congress upon the property committed to his management, or starting on a moment's notice journeying across the continent, to the capital of a distant state, or to adjust a complicated controversy at Havana; he was never free from the pressure of his position.

Wherever the wires reached men were always talking to him about business. He was a good talker, whether engaged in debate or speaking from the platform. He was a rapid and clear thinker, and his speech flowed easily, with a racy flavor of sarcasm or humor, as fact or fancy directed him; his observation covered a wide range of vision, with a broad knowledge on all public questions. He was a politician by instinct, strong in his Republican convictions and warm in his friendships.

It was to his credit, being early consulted by personal friends who were pressing General Grant for a third term for President, that he refused to be a party to that movement, taking such a stand in the counsels of his party that did much to render that nomination impossible. After the death of Horace Greely, in the winter of 1873, Mr. Orton purchased a controlling interest in the New York Tribune and actually engaged Schuyler Colfax to become the editor-in-chief of that journal. The latter soon withdrew from the engagement and while in doubt about an editor Mr. Orton received an offer to take the paper off his hands at a price that afforded him some profit, an offer that he accepted, disappointing some of his friends thereby, and which he himself subsequently regretted.

The disease that brought death to William Orton was called apoplexy. It was a misnomer; he was killed by overwork; his life was brought to a premature end by the burden and strain of the office to which he gave conscientious attention, undermining his health. He died in New York City, April 22, 1878, when nearly fifty-two years of age.

William Orton would have been a striking and leading personality in any community in any line of work. In matters of executive ability he rose to the rank of genius.

After the death of Mr. Orton there was some talk of William H. Vanderbilt for the president of the Western Union Telegraph Company, but he did not want the place with his other duties. The senior vice-president, Dr. Norvin Green, was subsequently elected.

Telegraph Messages Wilfully Delayed in India.

A recent despatch from Bombay, India, says:

"Discontent on the part of the telegraph signalers with the new scheme of duties introduced by Mr. Newlands, the English expert, has produced the most serious congestion on the Indian lines. The director-general states that the operators are purposely and wilfully delaying messages. All deferred-rate telegrams are posted instead of being telegraphed, and 2,000 telegrams are held up at Rangoon. Cables forwarded from Europe via Teheran are seriously delayed from Karachi onwards."

The London Times, in discussing the telegraph situation in India, has the following:

"The news of serious congestion on the Indian

telegraph lines consequent, it is alleged, on the discontent of the signalers with recent changes in the departmental regulations will not surprise those who have been following the course of events in the telegraph department during the last few months. With a view to improve the working of the department, the government of India requested the authorities of St. Martin's le Grand to lend the services of an expert to investigate the whole system in force. Mr. J. Newlands was selected for the duty, and went out to India at the close of last summer. Lecturing at Rangoon at the beginning of the year, Mr. Newlands said that the system in vogue was altogether defective, and that the public had a right to expect better service. The department was badly in need of reform in all its branches, and unless taken in hand would never be able to cope with the growing volume of work. His criticisms, which do not seem to have been qualified by any recognition of the differences between English and Indian conditions of climate and work, excited some alarm among the operators, and from that time on there have been signs of uneasiness and dissatisfaction. Various changes in the regulations affecting the signalers were made, and others were understood to be in contemplation. It was unofficially stated at the end of February that a new scheme of duties had been worked out by Mr. Newlands for immediate introduction in the mofussil stations, and to be applied later to the 'Presidency' towns. The basis of the 'watch' seems to have been that of eight hours' continuous duty, in the night as well as in the day division. Meetings of signalers were held at Calcutta, Agra, and other large centers, and resolutions were passed praying the director-general to reconsider the new system of watches, as unsuited to the climate and conditions of India. Meanwhile, further trouble arose from a strike of the messengers in Calcutta, which was, however, settled by the grant of certain small concessions. On March 3 a deputation of some two hundred and fifty members of the signaling staff in Calcutta, headed by Mr. Lafont, the telegraph master, waited on the director-general, who said that they were unnecessarily excited, as the new scheme of duties had not yet been brought into definite operation. At a second interview certain modifications in the scheme were promised. Mr. Harvey, the officiating member of the Council for Commerce and Industry, was also seen by a deputation, which asked for a twenty-five per cent. increase of pay all round.

"Serious congestion of traffic was already being experienced a month ago, and representations were made to government on the subject by several of the chambers of commerce and trades' associations. In particular the Bengal Chamber of Commerce drew attention to the danger of a general strike of signalers, and to the serious loss this would entail on the commercial community. There could be no doubt, it said, that the discontent was more or less general, and the time would seem to have come when a searching inquiry into the whole matter should be made by government. It might reasonably be anticipated that if such an inquiry was promised the danger of a strike would be averted."

Government by Wire.

(From the London Daily Express of April 5.)

A situation that is entirely without precedent in the history of the British constitution exists to-day. There is no head of the government in the country. The King and the Prince of Wales are on the Continent. The Prime Minister has resigned office, and Mr. Asquith has not yet started for Biarritz to receive his appointment as Premier at the hands of the King.

If such a state of affairs had existed a hundred years ago, and Napoleon had seized the occasion to display his faculty for throwing all Europe into convulsions at a moment's notice, something like chaos would have been the result in this country. To-day, by the aid of the telegraph, it is as easy for King Edward in Biarritz to keep in touch with public events in Great Britain and to take his part in the government of the country as it was for one of the Georges when he had only gone as far away from Buckingham Palace as Windsor Castle.

Government by telegraph is one of the most striking developments of the last half-century. Rulers and their ministers can go where they choose and yet keep in the closest touch with the affairs of their nations.

When the Kaiser was rustivating in Hampshire last year he had a private telegraph office fitted up at Highcliff Castle, and during the whole of his stay in England he transacted his business with the same regularity and as expeditiously as if he were in the imperial palace at Potsdam.

Modern science has made life very pleasant for twentieth-century monarchs compared with their feudal predecessors. The mediæval monarch with a weakness for sightseeing who had the temerity to leave his country for a brief excursion probably came back to find that there had been a revolution in his absence without his knowing, and that instead of being a king he was merely a private person in imminent danger of having his head chopped off.

Even Asiatic monarchs who rule peoples in which the primitive instincts are still the strongest come and go with the regularity of the confirmed Cook's tourist. The King of Siam wanders round the watering-places of Europe; the late Shah had a passion for traveling; even the Ameer of Afghanistan made the excursion of his life last year, and traveled all through India.

In Europe King Leopold spends half his time in Paris, King Alfonso makes long stays in England, and King Edward spends three or four months a year abroad. But they never lose touch with their capitals, and if one of them were to cross the Atlantic he could receive despatches at sea by wireless telegraphy rapidly and precisely.

The two heads of great powers who are forbidden by their constitutions to leave their native soil are the Mikado and the President of the United States. The Mikado in this respect is the

most circumscribed modern ruler, for though Mr. Roosevelt may never leave United States territory he has half a continent to roam over. When he goes on his shooting expeditions in Wyoming he is as far from his capital as King Edward would be in New York, but the President manages to transact his state business in the gorges of the Rockies nearly as easily as if he were in Washington.

Fast trains and fast steamers by which they can return rapidly have contributed almost as much to the comfort of travel-loving kings as the telegraph and the telephone. Supposing, however, by a wild stretch of the imagination, that communication by wire with the Continent was cut off, and that a foreign fleet began to land an army to-day on the Essex marshes, or that some one organized a revolution and sacked Buckingham Palace, and that there was no means of informing the King. Who would be the executive head of the realm?

The responsibility would devolve on the person of Lord Loreburn, the Lord Chancellor. The popular lawyer, whom everybody knows as "Bob" Reid, would be the central figure of a great drama, and the responsibility for the security of the nation would devolve on him.

The Lord Chancellor is the keeper of the great seal of England, which he hands to the King to be affixed to all important state documents. James II. thought the tenure of the great seal so important that when he was fleeing from Ireland to France he threw it overboard, hoping thereby to stultify all the behests of William III. But another was made, and William was secure on his throne.

All sorts of fascinating questions are raised by the absence of the King and the assumption of semi-royal functions by the Lord Chancellor. Would Lord Loreburn, for instance, be commander-in-chief of all the forces of the Crown—naval and military? Would he also be the head of the Church?

These possibilities are in the last degree unlikely, but it is curious that so much faith is placed in the reliability of the telegraph that the constitution makes no provision for such a situation.

The absence of the King used to be met by the appointment of a person known as a Justiciar when His Majesty went abroad. This fell into desuetude in the reign of Henry III. After that there were appointed custodes regni or locum tenentes. Thus, when Henry III. went to Gascony, the Queen and the Earl of Cornwall were made guardians of the realm.

A Council of Regency took control of state affairs when Edward I. went abroad, and when William III. went to Holland Queen Mary was given power by statute to exercise the royal prerogative. Regents or Lord Justices exercised this function during the absences of the Georges. The Prince of Wales was made Guardian and Lieutenant of the Kingdom in 1716, and in 1732 Queen Caroline occupied the same position.

The last occasion when Lords Justices exercised the royal prerogative was in 1821 during the absence of George IV. Since then no provision has been made for the absence of the monarch—a remarkable testimony to the faith placed by the government in the reliability of the telegraph wires.

The World's Telegraphs.

The Bureau International des Administrations Telegraphiques has issued its report for the thirty-ninth year, viz., 1907. In accordance with the resolution adopted by the Berlin Wireless Telegraph Conference of 1906, the Bureau organized a department to deal with this branch of the service, and it was fully working on January 1, 1907. The following countries are now adherents of the St. Petersburg convention, viz., Germany, Argentina, Australian Commonwealth, Austria, Belgium, Bolivia, Bosnia-Herzegovina, Brazil, Bulgaria, Cape of Good Hope, Ceylon, Portuguese Colonies, Crete, Denmark, Egypt, Spain, France and Algeria, Great Britain, Greece, Hungary, British Indies, Dutch Indies, French Indo-China, Iceland, Italy, Japan, Luxemburg, Madagascar, Montenegro, Natal, Norway, New Caledonia, New Zealand, Orange River Colony, Holland, Persia, Portugal, Roumania, Russia, Senegal, Servia, Siam, Sweden, Switzerland, Transvaal, Tunis, and Uruguay. The total area of all these countries is 65,895,439 square kilometers, with a population of 945,413,154.

Of the various telegraph companies, nineteen are adherents, fifteen conform to regulations although non-adherents, and five correspond with the bureau through the medium of other companies. In the first group are included the Black Sea, Commercial, German Atlantic, East European, French, German-Dutch, Rio de la Plata, Direct Spanish, Direct West India, Eastern, Eastern Extension, Great Northern, Halifax and Bermudas, Indo-European, South American, Spanish National, West African, West India and Panama, and Western Telegraph and Cable companies. The second group comprises the African Direct, Amazon, Western Union, Anglo, Central and South American, Commercial Pacific, Cuba Submarine, Direct United States, Eastern and South African, Europe and Azores, India Rubber, Gutta-Percha and Telegraph Works, Mexican, Pacific and European, River Plate and West Coast of America Telegraph and Cable companies. The third group consists of the African Trans-Continental, British North Borneo, Commercial (Cuba), Postal and United States and Hayti Telegraph and Cable companies. After enumerating the various cables laid and telegraph lines constructed, the report states that during the past year 5,200 new offices were opened to international traffic.

The bureau had estimated their receipts for 1907 at £6,501 and expenses at £2,580, whereas they amounted to £5,663 and £2,511, respectively, leaving a sum of £769 in favor of the admin-

istration. The estimated receipts and expenditures for 1908 are also given, which, in view of the telegraph conference to be held at Lisbon, Portugal, on May 4, are higher than in 1907.

Insuring Telegraph Messages.

Denmark proposes to establish a method whereby telegraph messages can be insured by the sender, as has been previously mentioned in this journal. In other words, for a certain additional cost the company guarantees safe and accurate delivery, or, where such is not brought about, makes good.

It is due to a telegraph operator, M. Gredsted of Copenhagen, that the Danish government is now earnestly considering the advisability of taking up the insurance question.

For certain reasons the state department did not consider it advisable for it to take the matter in charge, but the greatest consideration was shown the project, especially to the extent that the department of telegraphs was authorized to accept the premiums due for the insured messages. Probably the best method, and one which is meeting with general approval, is the plan to issue stamps, which, when attached to a message blank, will inform the operator the telegram is insured against delay or wrong interpretation, whether from the sending or receiving station. It may be taken for granted that the operators under such conditions will be on their guard.

No other country in the world has so far considered it advisable to insure telegraph messages, and it will be the office of the Danish Transportation Insurance Company, the "Danish Lloyd," to be the pioneer in this direction, since the department of telegraphs is now negotiating with this company for that purpose. At the start it is considered likely that the premiums will be high, at least until such a time when the idea has had time to demonstrate its efficiency. In some instances, where commercial houses or industrial concerns doing much business over the wire desire to cover their entire telegraphic correspondence against loss through delay or mistakes, this can be done. So far the greatest amount for which any one telegram will be insured is to be 5,000 krone (\$1,350), but it is not unlikely that greater figures will obtain later on.

The Herald's Chinese Cable.

The New York Herald of April 10 contained almost three pages of very interesting matter relating to the Chinese boycott of Japan's commerce.

The features of the display were the reproduction of a code telegram representing 1,800 characters of the Chinese language and the reproduction of this in Chinese type.

The process by which the code was made out and printed was given to the readers and proved very interesting. When the cipher was received it was sent to a Chinaman to be translated, which he did in Chinese characters.

The Military Telegrapher in the Civil War.

PART TWO.

Continuing the publication of letters begun in the April 1 issue of TELEGRAPH AGE, written by military telegraphers who were active in the field performing highly important and patriotic duty in connection with the army during the Civil War, the following by Duncan T. Bacon, dated at Logansport, Ind., June 30, 1879, is an interesting contribution to the series. It was addressed to Col. William R. Plum, for insertion in his history of The Military Telegraph during the Civil War, a plan, as previously stated, that was abandoned by reason of the great amount of matter received.

Here is the letter:

"As near as I can recollect I was sworn into the Government service at the St. Louis (Mo.) Arsenal in the latter part of July, 1861, by Major Gordon Granger, being, I believe, the fourth operator employed by the United States in the then 'Department of the West.' I was at once assigned to duty at the headquarters of General John C. Fremont in St. Louis, that office being in charge of J. C. Sullivan, familiarly known as 'Yankee Sullivan.' I remained at that office until General Fremont was superseded by General Hunter, when I was transferred to Benton barracks, then under the command of Major General S. R. Curtis. In January, 1862, I was sent out on the North Missouri road with General J. M. Schofield, and was stationed for a short time at Hudson, Mo. In the latter part of the month I was recalled from the northern part of the State and ordered to Rolla, Mo., there to report to General Curtis for field service. This I did, and was placed in charge of the construction and operation of the military telegraph line from Rolla as far as the army under General Curtis should move.

"While on this duty I built and opened a line of telegraph from Rolla, via Lebanon and Springfield, to Bentonville, Ark., a distance of some two hundred and fifty miles, and was present as operator and cipher clerk during the Battle of Pea Ridge, in March, 1862. While waiting at Springfield, Mo., for a supply of wire insulators and other building material I, as well as the men and operators under my command, were made very comfortable through the kindness of Captain Philip H. Sheridan, the post quartermaster, who placed one of the finest houses in the town at our disposal, and who also took care that our rations were of the best. Shortly after our supplies arrived, Captain Sheridan was ordered to St. Louis and assigned to the staff of General H. W. Halleck as staff quartermaster. After the Battle of Pea Ridge the army fell back to near Cassville, Mo., and I was ordered to St. Louis to take charge of the telegraph in the operations that were about to be commenced south of Cairo. I turned over the command of the telegraph department to Luke O'Reilly, an operator who had been with me all the way through from Rolla, and who not long afterwards became a great favorite with General Curtis, and was by him placed

upon his staff with rank of second lieutenant and aide de camp. When I last heard of O'Reilly he was captain and aide de camp on the staff of Major General A. H. Terry.

"Leaving the headquarters of General Curtis I, in company with one of my men, started for St. Louis, and after five days of hard horseback riding, averaging fifty miles per day, reached Rolla and there took the train for St. Louis. Immediately upon my arrival at the latter city I was ordered by Major G. H. Smith, superintendent of telegraph in the Department of the West, to report at once to Major General Halleck upon the steamer Continental, for service in Tennessee and Alabama, and almost before I knew where I was going I was on board of that vessel and bound down the river for Pittsburg Landing, Tenn. General Halleck and a large number of officers were also on board, together with a well organized corps of telegraph men, which had been placed under my charge.

"We arrived at Pittsburg, Tenn., on the evening of the second day of the battle of Shiloh, and found everything in the utmost confusion. One of the first things I did was to lay a telegraph cable, which we had brought with us, across the Tennessee River. This being successfully accomplished, we were soon in connection with Nashville and Louisville. I will here insert a copy of an order, the original of which I now have in my possession:

"Pittsburg, Tenn., April 18, 1862.

"Mr. Duncan T. Bacon is hereby authorized to take command of the construction party and the working and military lines at Pittsburg, Tenn., and as they may be built hereafter, until further orders. All operators will report to him for orders. Mr. Bacon will report daily to headquarters telegraph office or to Captain McLean, assistant adjutant general, for orders, and carry out such as he may receive with the utmost promptness.

"(Signed) GEORGE H. SMITH.

"Supt. Military Telegraph.

"Department of the Mississippi."

"In accordance with these instructions I at once opened an office at the headquarters of General Halleck, on the bluff overlooking the Tennessee River, and also opened a field office at the headquarters of the various division commanders, opening, I think, eight offices at as many different headquarters. The only names of operators in charge of these offices that I can now recall are L. C. Weir (Mr. Weir is now president of Adams Express Company, New York.—Ed.), at General Halleck's, and A. S. Hawkins at General Pope's. Mr. Hawkins, who was an old and intimate friend of mine, had, I believe, always been identified with telegraphy since that time, and up to the date of his death, which occurred at Memphis in the fall of 1878, from yellow fever, he having heroically volunteered to go to the assistance of his brethren in that plague stricken city, and fell at his post in the discharge of a more than soldier's duty.

"During the attack upon and the subsequent siege of Corinth, I remained in charge of the telegraph operations in the field before that place, and

upon the day after its fall, in June, 1862, I was ordered to Memphis.

[At this point two pages of the letter are missing.—Ed.]

"Some of the Confederate operators we found there were afterwards caught tapping the wires and furnishing information to the enemy, giving us no little trouble and annoyance. Notably among these were 'Ed.' and 'Alf.' Saville, both original secessionists, and willing at all times to fight for their side. The telegraph lines now having been put in working order, Memphis was once again placed in communication with the north. General Halleck still remained at Corinth, Miss., and General U. S. Grant was sent to Memphis to organize an expedition for operations at Vicksburg. Business getting quite heavy over the lines, I found I needed more assistance, and soon found a soldier who had had some previous experience in the telegraph business, so, upon my application, the following order was issued:

"Headquarters Dist. of West Tenn.,
"Memphis, June 26, 1862.

"Special Orders,

"No. 120.

"Private Philip Isaacs, Company C, 11th Indiana Regiment, is hereby detailed for special service and will immediately report to D. T. Bacon, United States Telegraph office, Memphis, for duty. By order of Maj. Genl. U. S. Grant.

"(Signed) JOHN A. RAWLINS,
"Asst. Adj. Genl."

"About this time the White River expedition, under command of Col. G. N. Fitch, of the 46th Indiana Volunteers, was started with the intention of forming a junction with General Curtis, who was coming down through Arkansas. These two officers were in the habit of reporting their progress direct to General Halleck at Corinth, through special couriers to Memphis, thence by cipher telegram to the commander in chief. These despatches were usually taken direct to me and by me put into cipher and forwarded. General A. P. Hovey, in command of the post at Memphis, claimed that he should be furnished with copies of all such despatches. Declining to furnish them, I was pre-emptorily ordered under arrest by the General. The following from Albert D. Richardson, Esq., Memphis correspondent of the New York Tribune, under date of July 18, 1862, to his paper, explains the affair:

"On Wednesday, General A. P. Hovey, commanding this post, ordered D. T. Bacon, Esq., manager of the military telegraph, to furnish him copies of official dispatches from General Halleck to General Curtis and Colonel Fitch. General Hovey's motives were doubtless good—to keep himself advised of everything important affecting his post directly or indirectly. But Mr. Bacon knew his duties too well to commit the gross breach of official duty required of him. He respectfully declined to obey the order. General Hovey directed his arrest, but Mr. Bacon was absent from the office when the orderly arrived, and one of his asso-

ciates, Mr. F. S. Van Valkenburg, was arrested instead. The case was laid before General Halleck by Mr. Bacon, when "Old Brains," as the General was familiarly known, promptly replied: "Release the operator at once. He did perfectly right in disobeying your orders."

"Shortly after this affair the troops in the vicinity of Grand Junction and Corinth, under command of General W. T. Sherman, were brought to Memphis, and the movements against Vicksburg were begun. General Halleck left Corinth and returned to St. Louis. The telegraph lines between Corinth and Memphis, being thus wholly unguarded, fell into the hands of the Confederates, who tore them down and carried off the wire, appropriating it to their own use further south. Memphis being again cut off from telegraph communication with the North, I was ordered, about the middle of August, to close the office and report with all instruments, supplies and employes, at headquarters at St. Louis, which I did as soon as possible. Capt. T. B. A. David, having superseded Major G. H. Smith as superintendent of United States military telegraphs, I was assigned to duty at headquarters office, St. Louis, Mo., where I remained until my resignation was accepted in April, 1863.

"I returned to my home at Ogdensburg, N. Y., taking a position there in a railroad freight office. At the time of the first draft for soldiers in July, 1863, I was lucky enough to draw a prize, and was one of the very first men drafted in the district, but my former service in the United States Military Telegraph Corps was considered of sufficient importance to exempt me from serving as a drafted man, and I was honorably discharged. I did not again enter the service, although I received tempting offers to do so from Capt. J. C. Van Duzer and other military telegraph superintendents, and I have since frequently regretted that I did not remain in the corps until the close of the war."

The Telegraph in Mexico.

The Mexican government is actively engaged in extending its telegraph lines in many sections of that country, establishing new offices and improving the service in every possible manner according to modern methods. Large quantities of telegraph material of the very best class are being purchased in the United States for carrying out these extensions. Telegraph business within this country has already reached large proportions, and is rapidly growing. The work in Mexico is being conducted under the direction of Don Camilo A. Gonzales, the director-general of the Federal telegraph lines of Mexico.

All telegraph lines in the Republic of Mexico belong to the Mexican government. The salary of telegraph operators ranges from sixty to one hundred dollars per month according to their intelligence, experience and the importance of the office where they work.

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

The Polyglot Stenocode.

By A. C. Baronio, of London.

Every telegraphic code, on whatever system framed, in proportion as it is the result of orderly thought and labor, will possess its own attractive features which will appeal to some particular user whose requirements are limited to the extent of the ground that has been covered by the work, but the great desideratum has always been an universal code suitable for all times and capable of use for putting into cipher everything that can be written in English or any other language.

The essential features which must distinguish such a code are three in number, two of which are demanded by the interests of the merchant or other user of telegraphy, and the third by those of the telegraph administrations whose business it is to carry the messages.

The two which concern the user are: (a) That it shall be economical, in that it enables the maximum of meaning to be conveyed by the minimum of words; (b) That it shall possess unlimited scope for expansion.

That which concerns the telegraph administrations is (c) That it shall admit of quick and accurate transmission along their lines by the use of the fewest possible number of electric impulses.

The author indicated the principles on which such a code could be constructed in one of his former publications (London, May, 1880), but, owing to the disabilities arising from the then existing regulations with respect to code words, and the limitations of the apparatus at that time in use on submarine cables, he did not proceed with the matter. It may seem strange that instrumental limitations in dealing with the relatively small amount of traffic carried by the submarine cable companies should have been a prominent factor in the postponement of the development of an universal system of coding; but it must be borne in mind that it is in precisely that class of work, carried at the high cost per word and strictly limited speeds of the cables, that coding becomes most valuable—nay, imperative—and consequently a code which these limitations deprived of much of its value was obviously in advance of its time.

These limitations have been practically removed in recent years by the great advance which has been made in the sensitiveness and precision of the apparatus now employed in cable signaling, and especially by the invention of the "drum relay" by S. G. Brown.

The action of the International Telegraph Conference, held in London in 1903, in authorizing the use in code telegrams of artificial ten-letter words removed all remaining obstructions, and has enabled the author to produce this "Polyglot Stenocode" system, which perfectly fills all the conditions which we have seen are essential to the long waited for universal code. That it fulfils the first and second of these conditions—

economy to user and scope for expansion—is shown by the fact, which appears from inspection of the table of conjugations, that, within a space nine inches by six, more than 1,000,000,000,000 different phrases are brought under immediate observation. Incredible as this might appear to those acquainted with the difficulties and restrictions of ordinary codes, it yet pales into insignificance when the reducer table is examined and the fact grasped that when the message has been coded by the Polyglot Stenocode the number of letters required to express it can still further be reduced by one-third, producing code words as now defined.

This table further provides an absolute safeguard against that great danger to which all other codes are exposed—of becoming useless through an alteration in the regulations governing the number of letters permissible in code words (say a reduction to eight-letter combinations)—for by its use Polyglot Stenocode words are capable of ready adaptation to such new length for the purpose of transmission, while still retaining many of the advantages and checks of the system. The third condition—facility and accuracy of transmission—is also filled in an equally complete manner; but owing to the necessarily technical nature of the subject, and the fact that some advantageous alterations in the present practice of signaling are required, a little explanation of the system in this respect is perhaps desirable.

The method used is a simplification of that described in "A Short Explanation of the Principles and Practice of Stenotelegraphy," the author addressed last year to all the telegraph authorities, and may, in its completest and most economical form, be summarized as the employment of biliteral combinations of a consonant followed by a vowel so selected as to be transmissible in the Stenocode alphabet by electric currents of uniform strength but varying direction or duration, after the manner of the common Morse system.

While the use of the Stenocode alphabet is necessary to obtaining the greatest benefit from the "Polyglot Stenocode" by the telegraph administrations, yet when used in conjunction with the slight changes in the ordinary Morse alphabet which were suggested in connection with plan A of Stenotelegraphy, a very considerable gain in the number of electrical impulses required to transmit each word is obtained, and also a substantial increase in accuracy.

It will be remembered that a feature of stenotelegraphy on that plan was that, by an exchange of characters between three of the letters, the alphabet is made to consist of two vowels of one element each, four vowels of two elements each, eight consonants of three elements each, and twelve consonants of four elements each.

This exchange of characters is carried one step further in the present system and "P" is also made to change with "W," for experience has shown that combinations of "P" with the vowels produce no syllables that are liable to be mis-

read either when written or signaled, and the aim of the author all through the compilation of this work has been to foresee and eliminate as much as possible every risk likely to lead to error.

The Polyglot Stenocode employs only the eight consonants of three elements each, and the four vowels of two elements each, which, when combined, give thirty-two biliteral syllables invariably composed of one consonant of three impulses and one vowel of two impulses.

The letters thus used are D, G, K, N, R, S, T, P, A, I, U, Y, and are to be signaled as follows according to the type of apparatus used:

THREE-ELEMENT CONSONANTS.

Letter.	Signalled by Morse or Dot and Dash Method.	Signalled by Recorder or Reversal Method.
D - - -	
G - - -	
K - - -	
N - - -	
R - - -	
S - - -	
T - - -	
P - - -	
TWO-ELEMENT VOWELS.		
A - -	
I - -	
U - -	
Y - -	

The effect of this arrangement, it is easily seen, is to give a direct gain of twelve and one-half per cent. in speed, combined with greatly increased accuracy, from the number of possible substitutions being substantially reduced, while most of the numerous class of errors caused by the running together or splitting of characters, failure of contact and misreadings, by which a letter may be converted into some other letter or letters, become capable of detection, and immediate correction, by each operator as the message passes through his hands, from the orderly sequence of consonant-vowel being interrupted.

This latter characteristic which Stenotelegraphy possesses in common with its elder sister Pantelegraphy, is in itself so self-evidently an immense aid to accuracy that it is to be hoped that the International Telegraph Conference will, at its coming meeting this year, see fit to amend its regulations so that all code words shall consist of biliteral syllables composed of consonant-vowel or vice versa. Such action on its part would remedy the complications and conflicts of interest which have arisen from the sole limiting qualification of pronounceability adopted by the last Conference, held at London, in 1903, while giving a great boon to the telegraphing public, a boon to the full value of which is only obtainable when it is a matter of professional knowledge to the operator that variation from the ordered sequence is, ipso facto, evidence of error.

A still further gain of twelve and one-half per

cent. in speed is perfectly feasible if desired; for, since each three-impulse consonant is followed by a two-impulse vowel and no other combination is admissible, while five of the combinations are invariably used to form a word, it follows that the space after each letter, rendered necessary by the irregular number of impulses that may go to form a letter in the ordinary Morse code, may be eliminated, and the message transmitted as a series of dots and dashes and divided up into letters and words at the receiving station.

The increased speed and accuracy thus shown to be derivable from the transmission of Polyglot Stenocode words with only a slight modification of the alphabet at present in use, and consequently by means of the same apparatus, are in themselves great enough to justify the claim that the system satisfies the third requirement of an universal code, and affords advantages to the administrations which are commensurate with those it offers to the telegraphing public.

When, however, these words are transmitted by the Stenocode two-unit special alphabet shown below, in which the letters are formed on the Stenocode principle, but by the use of only such combinations as are transmissible by currents of uniform strength, and therefore requiring no change of existing automatic apparatus, these advantages become much more marked.

STENOCODE TWO-UNIT SPECIAL ALPHABET TRANSMITTED BY CURRENTS OF UNIFORM STRENGTH.

Letter.	Transmitter Slip.	Receiver Slip.
G or A	• •	
K or I	• •	
D or U	• •	
P or Y	• •	
N	• •	
R	• •	
S	• •	
T	• •	

It might be objected that the same symbols being used to represent two different letters would result in confusion, but this objection loses its apparent force when it is noticed that the same symbol never represents two consonants or two vowels, but always a consonant and a vowel, and it is remembered that these invariably occupy different positions in the thirty-two biliteral syllables of which the Stenocode words are composed.

For example, the accompanying illustration could only read "gapynusaki," for otherwise the



fundamental rule of consonant-vowel sequence would be violated.

Stenocode words expressed in this alphabet

would invariably consist of twenty units as against the present average of forty units per code word, and thus a gain of fifty per cent. in the time required for transmission through each cable is obtained, while at the same time an immediate and efficient check on the accuracy of each word is placed in the power of each operator to apply as the message passes through his hands.

There are many other simple checks which could be employed to ensure accuracy when once the advantages of biliteral consonant-vowel code words, and the consequent shortening of the time required for their telegraphic expression, have been recognized by the administrations, and which are simply matters of preconcerted arrangement among them, but enough has been said to indicate the possibilities of the system in this direction.

Before concluding, however, the author would earnestly direct the attention of the cable companies, who are really the administrations most concerned, to the means herein provided for keeping down their working expenses by increasing the traffic capacity of their cables and clerks, as one solution of the problem confronting them of maintaining their dividends in the face of lowered tariffs and the increase of staff and other facilities that adherence to present methods would necessitate to deal with the resulting greater volumes of traffic.

The Telegraph as a Life Saver.

William Brady, a passenger traveling over the Mohawk and Malone division of the New York Central from Montreal to New York City, was stopped barely in time recently from taking a poison given through mistake by a Montreal druggist. Brady has the telegraph to thank for escaping death.

Shortly before the train left Montreal Brady entered a drug store and requested that a prescription he had compounded in a hurry, as he was about to leave the city. Soon after Brady had left the store with his medicine the druggist discovered that he had by mistake used a deadly drug in compounding the mixture. The druggist, thoroughly frightened, rushed to the Bonaventure station, and not knowing Brady's destination, or the train he left on, sent messages to several stations on the Grand Trunk and other roads, informing the man of the mistake which had been made.

One of these messages was sent to Tupper Lake, in the Adirondacks, and as the train stopped at that station the telegraph operator jumped on board and called Brady's name. Brady was at that moment standing at the water tank preparing to take the medicine. The mistake was explained and the medicine thrown away.

There are 1,653 male and 986 female operators in the London, England central telegraph office.

Wm. P. Davis, Western Union Chief Operator at Dallas.

William P. Davis, chief operator of the Western Union Telegraph Company, at Dallas, Tex., is a native of Omaha, Neb., where he was born forty-six years ago, in 1862. Like many another in the business, his telegraph career began in the messenger service and in his native place. This was in 1874. Shortly thereafter he drifted down to Dallas, finding employment in the Western



WILLIAM P. DAVIS.

Chief Operator, Western Union Telegraph Company, Dallas, Tex.

Union office, where he has since continuously remained, earning position and making a name for himself as an expert in his profession, high-minded of purpose, honorable in his dealings and steadfast in his friendships. In his present office he has served as clerk, clerk to the superintendent, operator, filling the positions of night chief and day chief, and now that of chief operator.

Insulation Resistance of Telegraph Lines.

In an article on telegraphy by W. Bubénik, appearing in a Vienna, Austria, technical journal, the *Electrical World* in an abstract of the same, says: In this mathematical article illustrated by diagrams, formulas are given for the loss of current due to imperfect insulation of the line against earth. The currents at the transmission end, as well as at the receiving end, depend on the insulation resistance of the line, as does also the magnetizing force of the telegraph apparatus. With a change of the insulation resistance due to weather or change of distance, etc., the magnetizing current of the instrument changes, and it may become necessary to adjust either the instrument or the voltage at the transmission end. The author prefers the last method, and shows that it is possible to subdivide the source of current so that lines of any insulation resistance may be connected to the source.

The new classified catalogue of books on the telegraph, telephone, wireless telegraphy, electricity, etc., published by TELEGRAPH AGE, may be had for the asking.

Representative Western Union Men at St. Louis.

The office of the Western Union Telegraph Company at St. Louis, Mo., ranks well up toward the top of the list of larger offices in this country of the great system of which it is so important an integral part. Yielding to the growing necessities of the situation, the St. Louis headquarters were removed about a year ago (to be exact the final transfer occurred on the night of April 28-29, 1907), from 412-414 Pine street, premises long before outgrown, and where for seventeen years it had been located, to the present position in the Commercial Building, at Sixth and Olive streets, in the heart of the business district of the city. This edifice is an imposing one, architecturally considered, and the ample quarters occupied by the telegraph company, with its complete equipment, comprehensively perfect in every detail, meeting the multitudinous, exacting and intricate requirements of modern telegraphic demands—the office may well be accepted as a model. It is no wonder that the great staff centered here are proud of their environment. They may well be, for nowhere is there anything more completely designed to meet telegraphic needs.

In an article published June 1, 1907, this office was fully described, as well as its equipment and connections. In the same account an extended reference was also made to the chief members among the operating force of this office, as it then existed, as well as the length of service with which many of them were credited. The present article has more to do in specifically referring to a few of the heads of departments.

GEORGE J. FRANKEL, SUPERINTENDENT AT
ST. LOUIS.

St. Louis is the headquarters of the superin-



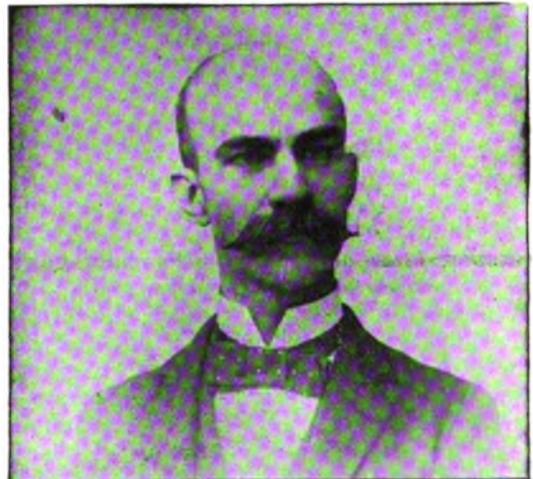
GEORGE J. FRANKEL.

Superintendent, Western Union Telegraph Company, St. Louis, Mo. Mr. Frankel occupies an office on the seventh floor

of the building, from which he directs the extended business pertaining to his district. He was appointed to his position early in 1902. He reached his fiftieth year on December 30 last, having been born at San Antonio, Tex., in 1857. Beginning business life when fifteen years of age, as a messenger boy in his native town, he subsequently went to Dallas as a telegraph clerk, going thence to Houston, where he acquired a knowledge of operating. As a manager in Western Union employ at Jefferson, at Marshall and at El Paso, although he showed much executive ability, he nevertheless left the commercial telegraph to accept the position of a train dispatcher for the Texas and Pacific Railway, yet he was glad a year later to go back to the Western Union, which he did as manager of the office at Sherman. But Mr. Frankel was wanted for better things, and two years later he went to St. Louis as chief clerk to the superintendent. On May 1, 1897, he was appointed assistant superintendent to Theodore P. Cook, being elevated to the superintendency five years later, when Mr. Cook went to Chicago as general superintendent.

RUDOLPH H. BOHLE, MANAGER AT ST. LOUIS.

On September 28, 1907, R. H. Bohle completed twenty-one years of continuous service as manager of the Western Union Telegraph Company at St. Louis. He has been so long in this position and has become so thoroughly identified with telegraph interests, in particular with the company which he so admirably serves, that locally one is regarded as the synonym of the other. With added years of service comes a larger experience, a ripper knowledge, and to-day Mr. Bohle is a better manager than ever before. He is popular among business men, and it may truthfully be said that Western Union interests do not



RUDOLPH H. BOHLE.

Manager, Western Union Telegraph Company, St. Louis, Mo.

suffer in his keeping. Perhaps this is due in part to the fact that Mr. Bohle is a native of St. Louis, the date of his birth being November 2, 1850, and on that account he feels a certain respon-

sibility attaching to his position, a dignity to maintain that possibly another, foreign to the place, would not be so sensitive to uphold. Be that as it may, of one thing we know, and that is his good stewardship remains unchallenged.

On November 6, 1861, young boy that he was, he became a messenger in the service of the United States Military Telegraph Corps in St. Louis, the first so employed. He soon learned the art of telegraphy, and after the close of the Civil War he entered the employ of the Western Union Telegraph Company, and when but shortly turned sixteen years of age, was appointed manager of the telegraph office at the board of trade. Here he remained for twenty years when his faithful service was rewarded by appointment to the office he now holds, endorsed for that post by a very general expression of approval by the business men of his city.

WM. E. BELLMAN, CHIEF OPERATOR AT ST. LOUIS.

William E. Bellman, the chief operator of the office at St. Louis, is a man now forty years of



WILLIAM E. BELLMAN.

Chief Operator, Western Union Telegraph Company, St. Louis, Mo. age. It was over twenty-three years ago that he began his telegraphic career, which he did in the railroad service on the Nickel Plate system. In the field of railroad telegraphy he became an adept, eventually rising to the position of train despatcher, later being appointed chief clerk to G. C. Kinsman, superintendent of telegraph of the Wabash Railroad, at Decatur, Ill. In 1889 Mr. Bellman was appointed chief operator of the office at Cedar Rapids, Iowa, later going to Kansas City. Seven years ago he became connected with the Western Union Telegraph Company, at St. Louis. His versatility of character is shown in the fact that during this comparatively short period of time he has successfully filled numerous offices of responsibility, including those of solicitor, manager of branch offices, division chief, traffic chief, and lastly that of chief operator. During the continuance of the World's Fair at St. Louis, he was given charge of his company interests at the exposition grounds.

COL. M. D. CRAIN, NIGHT CHIEF OPERATOR AT ST. LOUIS.

Colonel M. D. Crain, night chief operator at St. Louis, respected in the service of which he is a well-known and vigilant member, has behind him a long, honorable and varied record as a telegrapher, of which his abilities still keep him well to the front. Few there are who enjoy, and deservedly so, a finer reputation for probity of character and the qualities that go to constitute a gentleman. He is a soldier endowed with energy, equally exacting of and yielding to obedience, in the department over which he is in charge. With the newspaper fraternity he is on the best of terms, and on stormy nights the press has frequent occasion to accord him only words of praise. Born at Norwich, N. Y., April 1, 1841, Colonel Crain early in life showed abilities as a telegrapher. The story of his life has often been told, yet in brief it may be recapitulated that in 1858 he opened every telegraph office on the line of railroad between Terre Haute and St. Louis. He served as a military telegrapher throughout



COL. M. D. CRAIN.

Night Chief Operator, Western Union Telegraph Company, St. Louis, Mo.

the war, and was present at many of its hard fought battles. In 1863 he was appointed chief operator of the military office at St. Louis, by Colonel Robert C. Clowry, now president of the Western Union Telegraph Company, as a reward for meritorious conduct in the field. He has been connected with the Western Union Telegraph Company at St. Louis since 1871, excepting for a brief period of service at Kansas City. He was appointed to his present position in March, 1892.

HENRY GOSTING, ASSISTANT CHIEF OPERATOR AT ST. LOUIS.

Henry Gosting, assistant chief operator at St. Louis, is another bright member of the operating staff at that point, a young man still who by his integrity of purpose, and ability to do things, is winning his way upward in the line of telegraph advancement. He was born thirty-five years ago

and entered Western Union employ in 1887, as a check boy. Such was his aptitude, however, for the profession in which he had embarked, that two years later, after he was well grounded in the art of telegraphy, he was appointed manager of the office at Camden, Ark. Subsequently he served as an operator in the St. Louis office, where



HENRY GOSTING.

Assistant Day Chief Operator, Western Union Telegraph Company, St. Louis, Mo.

he gained much experience, later spending two years at the key in Chicago. Returning to St. Louis his rise has since been rapid, for during the last four years he has filled with much acceptability the positions of division chief, assistant wire chief and now that of assistant to Mr. Bellman.

ARTHUR MITCHELL, NIGHT FORCE CHIEF AT ST. LOUIS

Arthur Mitchell, Sr., night force chief in the St. Louis office, has a record of over twenty years of continuous service in that office. He is recognized as a man of varied business accomplish-



ARTHUR MITCHELL, SR.

Night Force Chief, Western Union Telegraph Company, St. Louis, Mo.

ments, and conducts his office with a firm hand, yet in such a manner as to command the respect and confidence of employes. Two events in

1893 brought Mr. Mitchell prominently before the local telegraph fraternity, namely, the successful management of a telegraph tournament and a go-as-you-please walking match. Mr. Mitchell possesses a highly artistic temperament, and outside of the sphere of telegraphy, to which he devotes himself assiduously when others sleep, he has achieved considerable success and is recognized as a landscape painter of merit. He is a member of the St. Louis Artists' Guild, and is a regular exhibitor at the Society of Western Artists. He was awarded a diploma of honorable mention at the Lewis and Clark Exposition.

F. E. PATRICK, TRAFFIC CHIEF, BARCLAY DEPARTMENT, AT ST. LOUIS.

Frank E. Patrick, traffic chief of the Barclay department, in the St. Louis office, was born at Manhattan, Kan., July 14, 1873, and entered the service of the Western Union Telegraph Company at the age of fourteen as a messenger at Springfield, Mo. He has remained with that company almost continuously since then excepting three years spent at the Northwestern University, Evanston, Ill., and one year during the Spanish-



FRANK E. PATRICK.

Traffic Chief, Barclay Department, Western Union Telegraph Company, St. Louis, Mo.

American War, when he was appointed captain of Company F, Ninth United States Volunteer Infantry, by President McKinley. For a time he was in charge of the department of claims of this company. Mr. Patrick is a Shriner and a member of the famous St. Louis Moolah patrol. It will interest many friends at St. Louis to state that Mr. Patrick is the agent in that city for Telegraph Age in Western Union circles.

The Postal Telegraph Clerks' Association of Great Britain, held its twenty-eighth annual conference in Glasgow April 9 to 11. It was reported that the association numbered 8,748, with 246 branches. It was agreed to grant three seats to women on the executive body, and to place the sole responsibility of management in the hands of the executive.

The Rugh Composite Telegraph and Telephone System.

The patent recently granted to Harry O. Rugh, of Sandwich, Ill., for a composite signaling and telephone system, numbered 882,347, relates to electrical systems for transmitting intelligence, and finds a most useful embodiment in composite signaling and telephone systems wherein the same line conductors act to convey telephonic and telegraphic currents. In the usual embodiment of this invention, a transmission line is employed to connect telegraph stations and telephonic outfits are connected between said telegraph stations. Where the telephonic outfits are connected with the transmission line, two sets of coils are employed, preferably each containing two coils preferably of the same ohmic resistance, one of each pair of coils possessing high impedance and the other preferably little or no impedance. The telephone receiver has its terminals connected or adapted for connection with the two sets of coils, the connection of one telephone receiver terminal being between the coils of one set or pair and the connection of the other telephone receiver being between the coils of the other set or pair. One impedance coil is interposed between one telephone receiver terminal and one telegraph station and the other impedance coil is interposed between the other telephone receiver terminal and the other telegraph station. One non-inductive resistance coil or connection is connected between one telephone receiver terminal and one telegraph station and the other non-inductive resistance coil or connection is connected between the other telephone receiver terminal and the other telegraph station. By this arrangement, the telegraphic currents find access through the two sets of coils in parallel. The impedance coils force said incoming telephonic current through the non-inductive resistance coils or connections and the telephone receiver associated therewith. In short, it will be seen that it is provided at each telephone station a quadrilateral, two opposite sides of which contain the impedance devices that have been described, while the other sides of the quadrilateral include means whereby the telephonic currents may be conveyed. These latter sides of the quadrilateral may, if it is desired, include impedance windings that are shunted by condensers, the condensers permitting the passage of telephonic currents while the impedance devices permit the passage of telegraphic currents.

What Mr. Rugh claims as being new in his invention is summed up as follows:

1. In a composite telegraph and telephone system; the combination with a transmission conductor affording passage for telegraphic current, a plurality of telegraph stations connected thereby, a plurality of telephone stations also connected thereby, said transmission conductor normally permanently extending to all of said telegraph and telephone stations, a quadrilateral of connections at each telephone station, the telephone receiver circuit at each telephone station

having one terminal connected between two of a pair of the sides of said quadrilateral and the other terminal connected between the two sides of the remaining pair of sides of said quadrilateral, the said pairs of sides of said quadrilateral each being connected in series with the transmission conductor, the telegraph stations also being in serial relation with said quadrilateral, opposite sides of said quadrilateral possessing impedance to telephonic current and being interposed between the associate telephone receiver circuit and the telegraph stations while the remaining sides of said quadrilateral afford passage for voice currents, all of the sides of said quadrilateral affording passage for telegraph currents.

2. In a composite telegraph and telephone system, the combination with a transmission conductor affording passage for telegraphic current, a plurality of telegraph stations connected thereby, a plurality of telephone stations also connected thereby, said transmission conductor normally permanently extending to all of said telegraph and telephone stations, a quadrilateral of connections at each telephone station, the telephone receiver circuit at each telephone station having one terminal connected between two of a pair of the sides of said quadrilateral and the other terminal connected between the two sides of the remaining pair of sides of said quadrilateral, the said pairs of sides of said quadrilateral each being connected in series with the transmission conductor, the telegraph stations also being in serial relation with said quadrilateral, opposite sides of said quadrilateral possessing impedance to telephonic current and interposed between the associate telephone receiver circuit and the telegraph stations while the remaining sides of said quadrilateral afford passage for voice currents, all of the sides of said quadrilateral affording passage for telegraph currents, conductors extending from the transmission conductor and completing the telephonic circuit, and condensers in said conductors.

3. In a composite telegraph and telephone system, the combination with a transmission conductor affording passage for telegraphic current, a plurality of telegraph stations connected thereby, a plurality of telephone stations also connected thereby, said transmission conductor normally permanently extending to all of said telegraph and telephone stations, a quadrilateral of connections at each telephone station, the telephone receiver circuit at each telephone station having one terminal connected between two of a pair of the sides of said quadrilateral and the other terminal connected between the two sides of the remaining pair of sides of said quadrilateral, the said pairs of sides of said quadrilateral each being connected in series with the transmission conductor, the telegraph stations also being in serial relation with said quadrilateral, opposite sides of said quadrilateral possessing impedance to telephonic current and interposed between the associate telephone receiver circuit and the telegraph stations while the remaining sides of said

quadrilateral afford passage for voice currents, all of the sides of said quadrilateral affording passage for telegraph currents, and conductors extending from the transmission conductor and completing the telephone circuit.

Telegraph Reminiscence.

David Homer Bates, of New York, although now and for many years past no longer in the telegraph service, of which formerly he was a bright ornament, is nevertheless, even in the midst of a busy life, loyal to its best memories and illustrious traditions. Old timers know him to be a veritable encyclopedia of telegraphic lore, abounding with information of scenes, events and personages of long ago, which he delights to place at the disposal of all who may be interested. This, in fact, he sturdily holds to be part of the duty of life incumbent upon all old timers who are in possession of data of like character, especially if it be of historic value. Attracted by the large amount of reminiscent matter which has appeared in TELEGRAPH AGE during the past year, Mr. Bates a short time ago wrote to this Journal pronouncing warm approval of the policy of management that encouraged such contributions, and expressed the hope that many others who had anything good of like nature to communicate would do so through these columns.

Mr. Bates' suggestion is to be commended. There are a number of former telegraphers in New York, as well as elsewhere, who have met with success in life, many of them in abundant measure, in the pursuit of other avocations that have engaged their attention since they quit the key. In common with most telegraphers these men still retain a fondness for the friendships formed in the early days, for the genuine telegrapher is an individual of gregarious tendencies, and the remembrances of those cherished times, and of contemporaneous happenings within the fraternal sphere, are of a character usually to awake enthusiasm and interest in their recital.

In the effort to arouse a few of the aforesaid old timers to a realizing sense of the obligation which Mr. Bates said they owed to the guild in which formerly they were in close fellowship, and which will not allow them to become disassociated, Telegraph Age wrote a few days ago to J. Frank Howell, now a successful banker and broker in the Wall street district, with a view of enticing that gentleman into print with a chronicle of incidents, relating to the telegraph of—well, of the time when he was included in the ranks. A characteristic reply has been received from Mr. Howell, dated, not from his business office, but at the point which claims his best affections, namely, "Oakview Stock Farm," over at Englewood, N. J., where, when not engaged in financial operations, Mr. Howell is acting the part of an enthusiastic farmer. He refers to the scope and delightful nature of his work on the farm, and the fact that the dual character of his occupations leave him but little time to attempt anything further; expressing fear, indeed,

that cold type would make what he might say too chilly for general perusal. But warming up with recollections, stirred by the subject, he exclaims with fervor: "I never had such times as we have had on the Old Timers' trips, and enjoyed them because I could always find such agreeable companionship." Then he goes on to say that "telegraphic reminiscences are always interesting and it is a pity there are not more of them published, especially when if covered, as they might be, by a great number of pens." With the evident desire that he may be able to respond favorably to our request for a reminiscent article, yet perhaps, and it may be naturally so, reluctant to begin on such an undertaking, Mr. Howell concludes his letter: "Should a few spare moments disentangle themselves from the shrubbery, garden, flowers, pigeons, ducks, turkeys, Berkshire pigs, of which I have more than twenty; and the horses and the farm in general, I will try to work them out in a 'slow heat' along the lines laid down."

Addresses of Surviving Members of the United States Military Telegraph Corps Wanted.

The executive committee of the United States Military Telegraph Corps would like to have on file an up-to-date list of all members of the corps with their post office address in each case, together with the date and serial number of their certificates of honorable service under the Act of Congress of January 26, 1897; and especially the following names, in regard to whom the executive committee has received no recent data:

George Allison, Edw. C. Boyle, Henry Bowerman, John A. Cassell, Charles E. Chandler, Achilles P. Cochrane, A. D. Daugherty, John Dinan, William M. DeGrove, Frank H. Evans, George M. Farnham, Isaac C. Groomes, John M. Geiger, Martin E. Griswold, Joseph Hansen, Henry P. Hull, George S. Holmes, William E. Hertford, Minard Y. Holley, Francis M. Ingram, Seeley B. Knapp, Stewart W. Knapp, John P. Lathrop, Hector Lithgow, Charles H. Lithgow, Frank C. Long, William McCormick, I. T. McCloskey, Peter J. Murray, William S. Maynard, Henry S. Martin, James S. O'Brien, L. Ford Perdue, Amos C. Paxson, Charles H. Palmer, Jesse Ruggles, R. H. Ryan, Byron L. Robinson, Irving C. Showerman, Simon S. Small, William K. Smith, Andrew C. Schnell, Frank Spare, Henry C. Sprague, John W. Smith, John Scanlon, Ellis Stone, Joseph T. Tiffany, William E. Tinney, George Turner, George J. Talmage, Henry R. Trowbridge, Rudolph C. Voelker, L. W. Wortsman, J. S. Williams, John C. Wagner, H. W. West and A. A. Zion.

If this notice should catch the eye of any of those whose names appear herewith or of others who are able to supply the addresses, a postal card with the desired information will be welcomed and acknowledged by David Homer Bates, 658 Broadway, New York.

Letters from Our Agents.

PHILADELPHIA, WESTERN UNION.

H. V. Hudgens, of this office, was married April 29 to a Virginia lady.

Manlove Smith has returned to this office after a sojourn of two months at Jacksonville, Fla.

The many friends of George Snyder, who was one of the original printing operators back in the sixties, will be pleased to learn that he is recovering from a very severe and painful operation which was successfully performed in this city recently.

ST. LOUIS, WESTERN UNION.

Through the courtesy of Superintendent George J. Frankel and Manager R. H. Bohle, two large waiting rooms have been opened on the seventh floor of the Commercial Building, in connection with this office, for the convenience of the operating force. One room is designed exclusively for the women operators and the other room is for the male sex. These rooms have large windows admitting air and light, and are well furnished with tables and chairs. The daily papers and Telegraph Age are on file, all of which are contributed by the operators.

The St. Louis Barclay department displays a full page portrait of John C. Barclay, the inventor of the system, and the assistant general manager of the company and its electrical engineer. This picture appeared in the anniversary number of Telegraph Age and has been placed in a neat black frame. It is regarded as a fine likeness.

Samuel Sullender, an operator in this office, and Miss Alice Bagot, also an operator and formerly employed here, were married April 20.

Paul Rainey, for several years employed as an operator for this company in this city, and Miss Anna C. Sarensen, of Salt Lake City, were married at Ogden, Utah, March 15.

NEW YORK NEWS.

Assessments Nos. 477 and 478 have been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of John H. Kelly, at Brooklyn, N. Y.; William Olver, at Philadelphia; Alexander K. Marshall, at North Fork, Ky.; John P. Meder, at Carson, Nev.; David H. Christie, at Brooklyn, N. Y.; Thomas S. Young, at Mount de Chantall, W. Va.; George H. Wilson, at Los Angeles, Cal.; John Burry, at Staten Island, N. Y.; Thomas E. Maddex, at Bayonne, N. J.; Edmund W. Firmin, at New York.

The Hult Telegraph Key

Attaches to the frame of the typewriter and is a part of its keyboard. It reduces breaking to a mere motion of a finger instead of the old tiresome reach back of the machine to the wire.

Easier to break on than pressing a typewriter key.

Splendid exercise for paralysis.

Improves appearance of typewriter.

This is something you NEED. Order one and give it a trial. We guarantee full satisfaction or prompt refund of money. Price, \$2; postage prepaid. Testimonials FREE. High-grade repair and experimental work. Prices reasonable. Sending machine parts and repairing. Write us. Sending machine Jacks, 50 cents.

JOHN A. HULT & CO.

418 Kansas Avenue

TOPEKA, KAN.

Good Telegraph Delivery Service in England.

"Harry Johnstone, spectator, international football match, Glasgow," was the address on a telegram from Leeds, England, recently. The post office messenger found the correct Johnstone in the crowd of 121,000 that witnessed the game.

Mr. S. A. Duncan, of Atlanta, Ga., in renewing his subscription, observes: "I have been a subscriber to Telegraph Age so many years that I look for it almost as regularly as I do for my meals. I am glad to see the continued improvement and advance made by the paper, and trust that notwithstanding the panic the Age may continue to prosper."

"Lightning Flashes and Electric Dashes," a book made up of bright, ably written stories and sketches, telegraphic and electrical, that should find a place in the home of every telegrapher; 160 large double-column pages; profusely illustrated; price, \$1.50, carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Why not save your money and acquire the ownership of a home? The Serial Building Loan and Savings Institution, 195 Broadway, New York, offers a safe depository for the one and will aid you in securing the other under a system making such acquisition possible and easy. This is the telegraphers' bank, and it has been of aid to thousands.

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

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.

Rubber Telegraph Key Knobs.

No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. This renders the touch smooth and the manipulation of the key much easier. Price, fifteen cents.

J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

Log Pattern \$3.50
Logless Pattern 4.00
F.O.B. Columbia, Pa.

THE LEFLEY KEY.



The Best Key on the Market for Business and Profit. Because it does not stick; is durable; speedy; insures fine clear-cut Morse; an easy sender.

Send draft, express or P. O. money order.

S. B. LEFLEY,

Columbia, Pa. E. F. D. No. 1.

The Postal Telegraph-Cable Company of Texas.

Executive Offices, Dallas, Tex.
S. M. ENGLISH, General Manager.

Operates west of the Mississippi River in Southern Missouri and Kansas, Arkansas, Oklahoma and Indian Territories, Texas and Louisiana, with outlets at New Orleans, La.; Memphis, Tenn.; Vicksburg, Miss., and Wichita, Kan., at which points it exchanges business with the

POSTAL TELEGRAPH-CABLE COMPANY
CANADIAN PACIFIC RAILWAY COMPANY
COMMERCIAL CABLE COMPANY
HALIFAX-BERMUDA AND DIRECT WEST
INDIES CABLE COMPANY
NEWFOUNDLAND GOVERNMENT SYSTEM
UNITED STATES AND HAYTI CABLE
COMPANY
BRITISH PACIFIC CABLES
COMMERCIAL PACIFIC CABLES
DOMINION GOVERNMENT LINES TO THE
YUKON

THE Canadian Pacific R'y Co's Telegraph

Executive Offices, Montreal
JAS. KENT, Manager

The Largest Telegraph System in Canada
63454 miles of wire; 1860 offices.

DIRECT CONNECTION WITH
POSTAL TELEGRAPH-CABLE COMPANY
COMMERCIAL CABLE COMPANY
HALIFAX-BERMUDA AND DIRECT WEST
INDIES CABLE COMPANY
NEWFOUNDLAND GOVERNMENT SYSTEM
UNITED STATES AND HAYTI CABLE
COMPANY
BRITISH PACIFIC CABLES
COMMERCIAL PACIFIC CABLE
DOMINION GOVERNMENT LINES TO THE
YUKON

Direct Through Wires to All Parts of
CANADA
NEW YORK CHICAGO SAN FRANCISCO
BOSTON, ETC.

The Great North Western Telegraph Company of Canada

H. P. DWIGHT, I. McMICHAEL,
President. Vice-Pres. and Genl. Mgr.

Head Office: TORONTO

DIRECT WIRES TO ALL PRINCIPAL
POINTS

EXCLUSIVE CONNECTION IN THE
UNITED STATES WITH THE WESTERN
UNION TELEGRAPH COMPANY.

DIRECT CONNECTION WITH THREE
ATLANTIC CABLE STATIONS.

The Great North Western Telegraph Company has a larger number of exclusive offices than any other telegraph company in Canada, and its lines reach 49,280 offices in Canada, United States and Mexico.

DOMESTIC AND FOREIGN MONEY
ORDERS BY TELEGRAPH AND CABLE.

The North American Telegraph Company.

Organized 1886.

GENERAL OFFICES, MINNEAPOLIS, MINN.

H. A. TUTTLE, CLINTON MORRISON
Sec'y and Gen'l Manager. President.

Its lines extend through the States of
Minnesota, Wisconsin, Iowa and Illinois.

Connecting with the
POSTAL TELEGRAPH-CABLE CO.,
and the
COMMERCIAL CABLE COMPANY
COMMERCIAL PACIFIC CABLE COM-
PANY.

Exclusive direct connection with the tele-
graph lines of the Minneapolis, St. Paul
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 Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.
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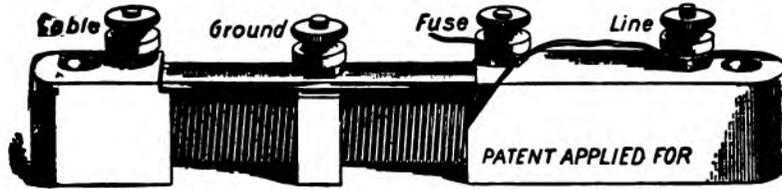
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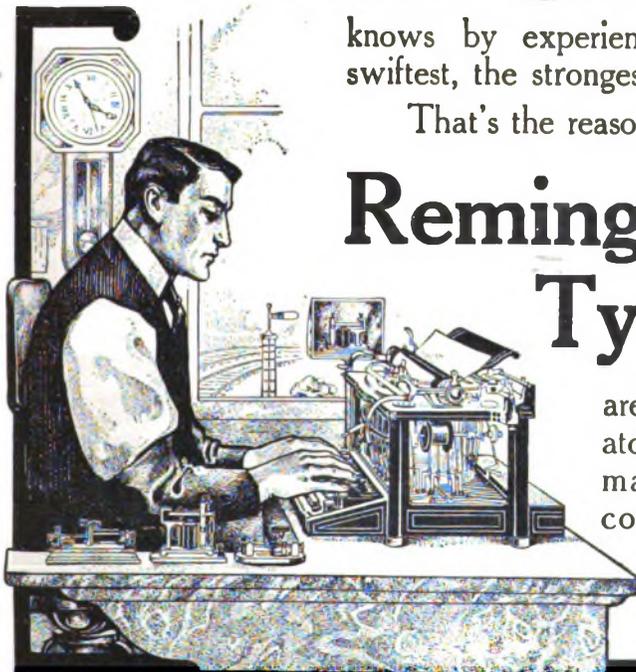
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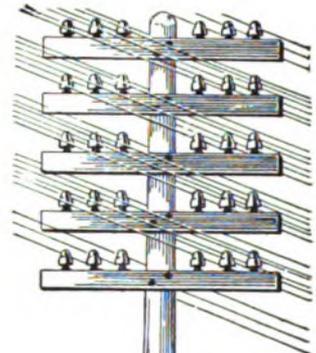
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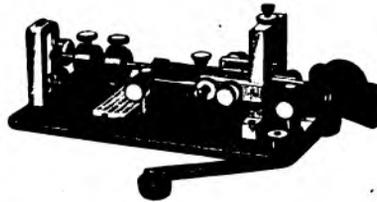
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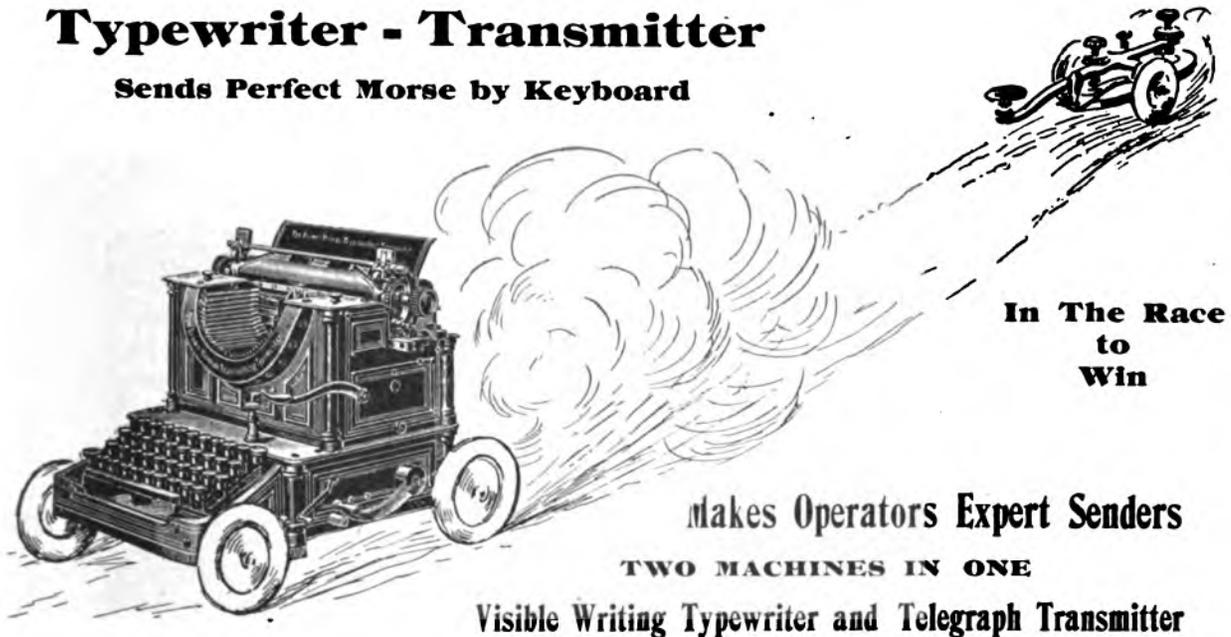
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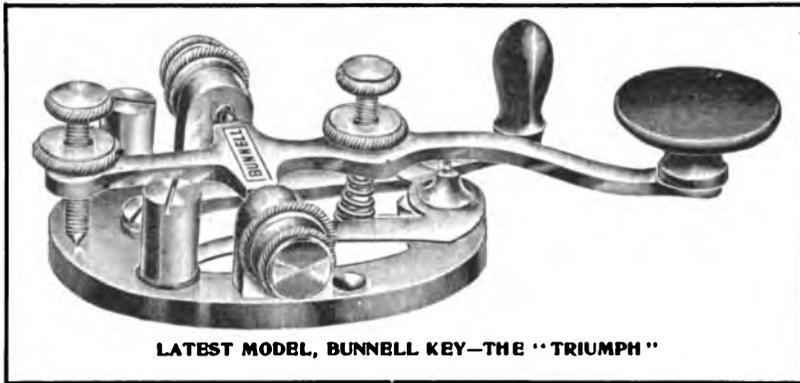
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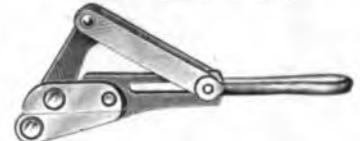
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No. 10.

NEW YORK, MAY 16, 1908.

Twenty-fifth Year.

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SOME POINTS ON ELECTRICITY.

The Freir Self-Polarizing Quadruplex Relay.

BY WILLIS H. JONES.

Because of the term "self-polarizing" being applied to the Freir relay there are a great number of operators who have the erroneous impression that Mr. Freir's quadruplex instrument for the common side of the circuit is merely a companion "polar" relay which responds to "direction" of current in the same or similar manner as its partner on the first side of the table.

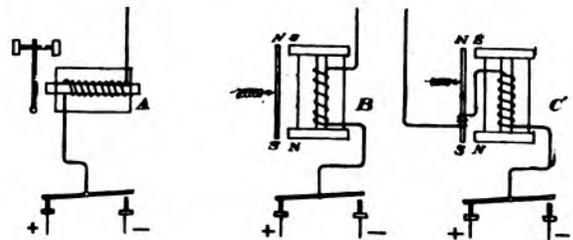
This, however, is not the case. Its operation depends entirely upon alterations in the volume of current flowing irrespective of its direction. In this respect it is identical with that of the old neutral pattern. The distinction between the two types is that in the old pattern the soft iron armature is moved by the mere attractive force of the relay magnet alone; that is to say, without any inherent power or tendency in the armature itself to help in the operation, while in the Freir pattern the self-polarizing of the armature by means of the multiplex current creates a little magnet of the lever and settings, each pole of which possesses a natural inclination to move toward the relay magnet having a radiation of opposite lines to itself, and thus tends to assist

the relay magnet. In order to take advantage of this property of a polarized movable armature lever then, it is simply necessary to arrange the coil winding in such a manner that the conditions in the magnetic circuit are favorable.

To illustrate this point let us note the magnetic effects obtained by the three arrangements shown in figures A, B and C, respectively, in the accompanying diagram.

A is an ordinary single line relay. B is practically the same thing somewhat differently constructed and possesses a lever armature consisting of a bar of hard steel which is permanently magnetized. The latter therefore possesses a north and a south pole of its own created by the magnetic lines of force it normally contains.

Now, the full or attractive strength of any magnet is equal to the square of the number of magnetic lines of force flowing through its iron core, hence, as shown in Fig. A, the pull can be no greater than that due to the lines of force the current alone creates, as the soft iron lever arma-



FIGURES A. B. AND C.

ture neither adds to nor diminishes the magnetizing energy.

In Fig. B, however, the steel armature being itself a magnet commingles its lines of force in the magnetic circuit when they flow in the same direction, and thus creates a stronger relay (other conditions of the magnetic circuit being equal). In other words, we have the combined strength of two magnets working in unison instead of one in the old, or neutral pattern.

If the lines of force in the steel armature (referring to the magnetic circuit) should happen to flow in the opposite direction to those in the relay core, or, in other words, oppose the latter, it is obvious that the total strength of the relay would be weakened to the extent that the former opposes. A permanent magnet, therefore, cannot be used for the armature of a common side relay where the polarity of the main line circuit, or magnetizing currents, is subject to alterations.

If, however, we substitute an electro-magnet for the steel bar in series with the relay coil, as shown in Fig. C, and arrange the winding thereof

in such a manner that the same current which magnetizes the relay core simultaneously magnetize the extra electro-magnet, the soft iron lever armature of the latter may be polarized inductively with the advantage that its polarity will change to meet each alteration in the relay and thus preserve the existing relationship between their respective signs regardless of the alterations in the polarity of the line current. The "pull," therefore, will be the same with either positive or negative current.

In the Freir relay for the common side of a quadruplex circuit the inventor has taken advantage of this knowledge in the construction thereof, as may be seen by a glance at Fig. D, which shows an end view of the three coils, two of which, b and c, correspond in construction with that shown in Fig. C, coil A being the usual companion spool as in the case of an ordinary neutral relay. Of course, this instrument, including the armature coil B, is differentially wound, although for simplicity it is not so shown in the accompanying cut.

In this relay the winding of the armature coil B and that of C is such that the same current

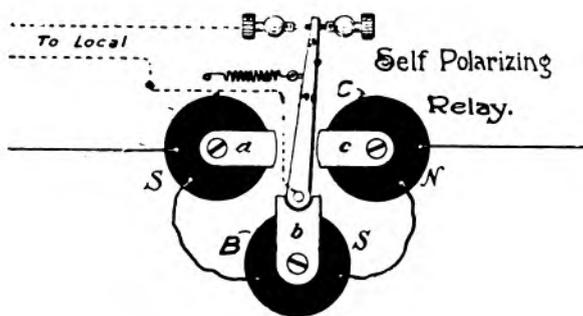


FIG. D.

flowing through each produces an opposite polarity in the iron terminals of one from that of the other. If B is positive and C is negative a change in the direction of the current merely causes the signs of the respective magnets to exchange places, but does not prevent or lessen their attraction for each other in the least.

It follows, then, by stiffening the retractile spring to a degree that will keep the armature b from being pulled over to the local contact point by the strength of the "short end" or weaker current, the lever may nevertheless be actuated by an increase of current from the distant end, which is purposely made strong enough to overcome the spring tension.

The question has frequently been asked, Why, considering the fact that coil A must be moved so far away from the lever armature for best results, the left-hand coil is necessary at all, and whether it would not be possible to operate a relay on a multiplex circuit with that coil entirely eliminated?

In reply we will say that such a thing is possible; that is to say, it would work fairly well

when the wire, weather, and other conditions are favorable, but so far as that goes, any old type of relay might do the same. In fact, a two-coil relay similar to that shown in Fig. C represents an English relay invented by Stroh, but as it never became very popular the indication is that it possessed a weakness. The third coil, added by Mr. Freir, is an improvement thereon, and as its action is evidently one of the factors which gives his relay its well known efficiency it follows that coil A cannot be ignored. All quadruplex attendants know that by merely altering the position of coil A better results are often obtained, hence there is no denying it plays its part.

As to the necessity of moving coil A some distance from the lever the following information will afford an explanation: The mass of iron in the armature is very small as compared with that in the cores, hence it is evident that if coil A has a much more intense field than B (the armature), the latter is liable to have its lines overpowered, being a feeble north, and A a stronger north, thus giving C the south pole, a greater opportunity to complete its lines of force through those of A instead of B and thereby only feebly or sluggishly attract the lever. For this reason coil A must be weakened by removing it a certain distance, and that distance is the point where the magnetic strength of the combination AB is identical with that of C. If A, B and C possessed equal magnetic strength of, say, 10 each, the armature would probably not have more than 6, hence A is moved back so B may have the necessary help to control the lever. When these conditions exist the magnetic field seems to have a maximum solidity or steadiness, each coil in a way tending to compensate any unevenness in the other.

Other factors which make for the efficiency of this relay are the absence of a yoke, freedom of armature movement, small self-induction and others fully described in the preceding article, appearing May 1.

As to the comparative merits of the Freir and the old type neutral relay it may be said that there are certain conditions where each has an advantage over the other. The yoke of the latter tends to give it a strong magnetism with an accompanying slow time constant, while the former is much quicker in action.

In a choice, therefore, for a standard instrument, so far as the Western Union Telegraph Company was concerned, guidance in the matter was very much after the manner one would pursue in selecting a horse, it all depends upon whether a truck, race, or family horse is most serviceable for general work. After a thorough trial by that company the Freir relay was considered the most suitable for all around work and finally was made its standard.

Recent Telegraph Patents.

A patent, No. 885,545, for a telegraph sounder, has been granted to James J. Thomas, of Whiting.

Iowa, and Albert G. Christopherson, of Scribner, Neb. The patentee has a pivotally mounted electromagnet, the poles of which move toward and from the fixed poles of a permanent magnet. Is intended to be more sensitive than the present type of sounder.

A patent, No. 885,688, for a relay, has been issued to Archibald S. Cubitt, of Schenectady, N. Y. Relay having current carrying coil and a core movable in the magnetic field thereof, and a frame serving as a path for the flux and as a magnetic shunt around said core. Includes means for varying the reluctance of the shunt path.

The following patents have expired:

Patent No. 450,630, for a printing telegraph, held by S. R. Linville and L. F. Hettmansperger, of Philadelphia.

Patent No. 451,449, for a telegraph repeater, held by A. C. Booth, of Cedar Rapids, Iowa.

Personal.

Mr. W. S. Burnett, of Milwaukee, electrical engineer of the Morse Code Signal Company, of that city, was in New York on May 4.

Dr. Leslie C. Love, of Montclair, N. J., and Miss Edith Manson, daughter of Mr. George T. Manson, general superintendent of the Okonite Company, New York, were married on April 21.

Mr. Orrin S. Wood, the first telegrapher in the world, has left New York for his country home at Turner, Orange County, N. Y., where he will spend the summer according to his usual custom.

Mr. A. L. Suesman, at one time and for many years, the general Western manager of The United Press, at Chicago, and early in life manager of the Providence, R. I., office, is now engaged in doing editorial work for the American Institute of Electrical Engineers, New York.

The cornerstone of the beautiful new building of the International Bureau of the American Republics, Washington, D. C., was laid on Monday afternoon, May 11. Major J. O. Kerbey, an old-time telegrapher, is at the head of one of the departments of this bureau.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Belvidere Brooks, general superintendent of the Eastern division, attended the shad dinner on Saturday, May 9, at Philadelphia, tendered by the John A. Roebling's Sons' Company, an event which is celebrated annually.

There has been installed in the offices of this company at St. Louis and Kansas City a number of motor generators which, it is said, possess features of improvement not found in other machines of this character. These motor generators are the product of the General Electric Company. The St. Louis plant, consisting of twenty

machines, was installed by H. S. Graber, the chief engineer of the telegraph company. The improvements embraced in these machines include the insertion of a fan which causes a forced circulation of air through the machine, thus greatly helping to keep down the temperature. These machines are excited from the primary, or 110-volt current. They also have laminated pole shoes and a large number of armature coils, thus giving a lower voltage between adjoining commutator bars; also, an improved brush holder, making a firmer contact between holder and brush.

Mr. J. Levin, general superintendent at Atlanta, Ga., has just returned from a tour of inspection covering the second and third districts of his division, being accompanied by G. W. Lloyd and B. F. Dillon through their respective districts.

RESIGNATIONS AND APPOINTMENTS.

F. J. Krumling, chief operator at Toledo, Ohio, was on May 1, appointed manager of that office to succeed J. F. Rawie, who resigned to remove to California. J. S. Reichert, formerly wire chief, succeeded Mr. Krumling as chief operator, A. A. Patterson being made wire chief.

O. L. Michaels, manager at East Las Vegas, N. M., has been appointed manager at Colorado Springs, Colo. He will be succeeded at the former place by F. D. Nash.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mrs. John W. Mackay, the mother of President Clarence H. Mackay, and his sister, the Princess Colonna, sailed for Europe on the Kronprinzessin Cecilie, on May 12.

Mr. H. J. Kinnucan, superintendent at Detroit, Mich., was a recent visitor.

Mr. Henry Scrivens, who for the past eight years has been chief clerk to E. G. Cochrane, general superintendent, has been appointed chief clerk to Charles C. Adams, second vice-president. The vacancy caused by the promotion of Mr. Scrivens has been filled by the advancement of A. H. Clarke, division cashier, the latter position being filled by the appointment of A. B. Parrish, stenographer.

The Chicago, Milwaukee and St. Paul Railway on May 4, organized and incorporated in Butte, Mont., the Continental Telegraph Company, capitalized for \$300,000. The St. Paul's contract with the Western Union Telegraph Company expired May 1. The new company will do a general commercial business, and the Continental Telegraph Company will cover the territory along the 10,000 miles of the St. Paul Railway when completed to the Pacific Coast, and have connections with other telegraph companies.

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.

The Railroad.

Mr. E. H. Millington, of Detroit, superintendent of telegraph of the Michigan Central Railroad Company, was a recent New York visitor.

The New York Central Railroad Company has closed its telegraph school at Albany for the summer, and possibly for an indefinite period. The reason for this action is that the company now has a surplus of operators. C. A. Wood, who has had charge of this school, has been assigned to duty in the office of the assistant general manager, P. E. Crowley, at Albany.

Mr. L. H. Korty, superintendent of telegraph of the Union Pacific Railroad Company, at Omaha, Neb., has resigned on account of continued ill health and has retired permanently from active business. He was appointed assistant superintendent of the road in 1881, and succeeded to the superintendency in 1887. He is succeeded by J. B. Sheldon, who has been Mr. Korty's assistant for many years.

As the time approaches for the holding of the convention of the Association of Railway Telegraph Superintendents, at Montreal, Que., on June 24, 25, 26 and 27, the prospects for one of the best and most numerously attended of meetings daily grows brighter. The convention numbers of Telegraph Age will embrace two issues, the first to be published on June 16, copies of which will be distributed at the convention itself, and the second on July 1, in which the full story of the convention will be printed.

In order that readers may not receive a possible wrong impression respecting the distances covered over which combined telegraph and telephone working on lines of the Canadian Pacific Telegraph system is concerned, mentioned in this column on April 16, it is well perhaps, in order to make the statement referred to more clear, to say that the distance so worked from Montreal to Fort William, a repeating point, is 995 miles, while the entire distance from Montreal to Winnipeg is 1,415 miles.

The May meeting of the Railway Signal Association was held in the Engineering Building, New York, on Tuesday, May 12. The subject in the forenoon was "Specifications for Electric Interlocking." In the afternoon a paper on storage batteries, by H. M. Beck, was read. Mr. Beck discussed the restoration of low cells. The secretary announced that as Mr. Beck treated his subject with reference to a single type of storage battery, it is desirable that makers of other storage batteries which are used for signal purposes should be represented at the meeting, with a view to bringing out the best methods of dealing with all kinds of storage batteries which may need restoration, and they were accordingly invited to be present.

The spring session of the American Railway Association was held at the Hotel Belmont, New York, April 22. There were present two hundred

and twenty-five delegates, representing one hundred and fifty members. The executive committee reported that the membership of the association now comprises three hundred and thirty-eight members, operating 240,770 miles; and the associate membership forty-four members, operating 1,630 miles. An election of officers resulted in the selection of F. A. Delano, president of the Wabash road, president; W. A. Gardner, vice-president of the Chicago and North Western Railroad, second vice-president. The next meeting of the association will be held at Chicago, on November 18.

The Railroad Commissioners of New Hampshire blame the federal government for a butting collision of freight trains which happened near Haverhill, in that state, on March 20, and in which five men were killed and two others injured. It is reported because of the federal statute the road had to hire young and inexperienced operators." The collision was due to the dropping of the word "East" from a telegraphic order directing the trains to meet at East Haverhill, making it read "Haverhill." It is preposterous to place the blame on the law as causing the accident. If the telephone had been in use on this railroad and had been brought into requisition the accident probably would not have occurred. One decided advantage of telephonic train orders over telegraphic train orders, is that the person receiving the order over the telephone personally executes it, whether it be the conductor or the engineer. In this specific case had the conductor received the order by telephone the repeating of the words "East Haverhill" several times would most likely have made a lasting impression on his mind, so that, if by any chance he had neglected to write the word "East" on his order, it would have become apparent to him on reading the order over that something was wrong, and he would naturally have sought its verification before attempting its execution.

We desire to state that back numbers of this paper, those issued more than six months prior to any current date, will be charged for at the rate of twenty-five cents apiece when they can be furnished. This price is fixed because of the necessarily limited stock we carry, and of the difficulty we have sometimes in filling an order. Oftentimes the request is for papers of a more or less remote date, with the expectancy of being charged at but ten cents a copy, whereas, in order to obtain the desired issue we are ourselves frequently obliged to pay the larger sum named or even more. The growing value of complete files of Telegraph Age should cause our readers to carefully preserve their issues.

The story of the rise of Francis T. F. Lovejoy from the position of a telegraph operator to that of a multi-millionaire, told elsewhere in this issue, will be read with the interest attaching to such a remarkable career.

Radio-Telegraphy.

A patent, No. 886,303, for a spark-gap apparatus, has been issued to Walter W. Massie, of Providence, R. I., assignor to the Massie Wireless Telegraph Company, Providence.

As a result of the disagreements between the French Cable Company in Venezuela and President Castro, it is stated that President Castro has taken steps to install five wireless stations at different towns to supplant the cable company. E. C. Newton, a representative of the De Forest Wireless Company, left Porto Rico several days ago to arrange with the President for the installations.

Consul L. Edwin Dudley reports that two wireless telegraph stations have been established in the vicinity of Vancouver, B. C. One station is situated at North Vancouver, just across Burrard Inlet. The other is at Point Gray, a peninsula, seven or eight miles distant. These stations promise to be of great service to coastwise trade between Vancouver, Puget Sound ports and Alaska.

A serious interruption to transatlantic wireless telegraph service occurred on April 22, when some of the aerial wires at the Glace Bay receiving station of the Marconi Company were broken during a severe storm. The broken wires were at the top of a tall mast over two hundred feet in height. Because of its covering of ice and sleet it was impossible to find anyone who would consent to be hoisted to the top until the subsidence of the storm, and such impedimenta was removed.

A patent, No. 886,302, for a combined tuning coil and condenser, has been granted to Walter W. Massie, of Providence, R. I., assignor to the Massie Wireless Telegraph Company, Providence. In this device there are provided an inductance coil, a condenser having movable plates, a lever for operating these plates to vary the capacity of the condenser, and a substantially circular inductance coil operatively associated with the condenser, approximately concentric with the axis of motion of and engageable by the lever.

A return which has been issued by the marine department at Ottawa, Ont., shows that from April 1, 1906, to March 31, 1907, 20,405 messages were transmitted through the Marconi wireless stations in the Dominion. The amount of tolls collected was \$0,033. There are in the Gulf of St. Lawrence and on the Atlantic seaboard thirteen stations. Three are low-power stations and cost \$5,000 each. The ten high-power stations cost double that sum. The company, while retaining all the tolls, receives \$2,500 and \$3,500 for operating the low and high stations, respectively.

Consul Wilbur T. Gracey, Tsingtau, transmits the following information regarding wireless telegraph installations which have recently been placed on the ships of the Hamburg-American Line running between Shanghai, Tsingtau and Tientsin: "Sea telegrams are those which are exchanged between ships at sea and the stations

situated on land. They must, when forwarded by way of wireless stations, be either in plain words or in code terms contained in commercial cable codes. If intended for ships at sea, the address must contain, in addition to its usual contents, the name or official number of the ship and its nationality."

President Roosevelt has sent to the Senate the reports of the War and Navy departments and the Department of Commerce and Labor on the international wireless telegraph convention signed at Berlin, November 3, 1906. All three departments recognize the necessity for some rules governing the exchange of aerial messages and approve the convention. The need is urgent, for the reason that there are now in the United States ninety-seven wireless shore stations. Of these forty are operated by the navy, sixteen by the army and forty-one by private concerns. A bill is now under consideration by Congress providing for rigid governmental control of wireless communication, and fixing penalties for private persons who interfere with government messages or indulge in "fake" messages.

Hans Knudsen, a Danish inventor, announces that he has perfected an invention by which he can set type on an ordinary linotype machine in Paris, by wireless waves thrown from London. He further states that he would publicly demonstrate his new invention within a few weeks. We are asked to believe by the inventor that the first machine has proved successful, setting 3,000 words an hour at a distance just as if the operator were working the machine. He even goes so far as to predict that the London correspondents of New York papers would soon be able to send their news straight to the printing press through the wireless operator. Knudsen, in demonstrating his device, sent photographs of King Edward, Queen Alexandra and Emperor William, it is said from one room through the wall into another, without wires, the pictures proving recognizable.

For the last few weeks the French War Office has been experimenting at the Eiffel Tower, Paris, with the system of wireless telephony invented by Lee De Forest, and the success of the experiments and their scope have just been published. Sets of apparatus were installed at the tower, in the Fort of Mont Valérein, and at Villejuif, a southern suburb of Paris. The experiment for telephonic communication between Villejuif and the Eiffel Tower succeeded excellently. Mrs. de Forest, using the apparatus at Villejuif, spoke quite easily to her husband at the Eiffel Tower, more than six miles away. By means of the apparatus at the Eiffel Tower and in Fort Mont Valérein, a conversation was carried on at a distance of three and a half miles with equal ease. The experiments were carried on before several officers of the French army and navy.

The appellate division of the German Patent Office has handed down an interesting decision affecting the future development of radio-tele-

raphy and radio-telephony. The decision has reference to the arc-interrupter patent of the Berlin inventor, Ernst Ruhmer, which materially affects the Poulsen system for the propagation of continuous electrical waves. The Amalgamated Radio-Telegraph Company, which is developing the Poulsen system, admits, it is said, that several Poulsen stations are working under the Ruhmer system. The German Poulsen patents relating to electrical radio-telegraphy and telephony and the German Ruhmer patents relating to the electrical arc interrupter have within a few days become the property of the C. Lorenz Actien Gesellschaft, Berlin, which will develop the patents in Germany. This amicable arrangement will prevent the contest between the two inventors, which was feared.

The Marconi Company's Report.

The Marconi Wireless Telegraph Company (England), has only recently made public a report of its condition, brought down to the period ended September 30, 1907. A London electrical journal, whose view is obtained at close range, in commenting upon the statement, had this to say:

"The long looked-for report of the Marconi Wireless Telegraph Company has at length been issued. The unusual delay that has taken place apparently been prompted, firstly, by the complex and delicate situation in which the company found itself when the Government decided to ratify the Radio-Telegraphic Convention, and, secondly, is due to the feeling of the directors that they ought, if possible, to be able to give a definite announcement as to the success of the transatlantic service. The latter has now been in operation for about six months, and thus the directors have had a fair opportunity of judging of the possibilities of the service, though during the greater part of that time the service has been very limited. Little is said as to the actual results that have been obtained, but it is mentioned (on the authority of the newspaper in question) that one newspaper in New York has received dispatches totaling 68,404 words during five months, promptly and efficiently transmitted. When the necessary enlargement and duplication of the machinery has been carried out it is claimed that the stations will be able to cope with a much larger volume of messages, and it is further estimated that the four stations—Poldhu, Clifden, Glace Bay and Cape Cod—working twelve hours a day at a speed of twenty words per minute, and at an average net rate of 4d. per word, will bring in a net revenue, after deducting working expenses, approaching to £150,000 per annum. Nothing is said in the report as to whether this rate of working has hitherto been maintained for any considerable period, though it is stated that the service has been conducted at speeds varying up to twenty words a minute, and that it is expected to attain a speed of thirty words a minute with certain improvements in the apparatus. The estimate, therefore, of twenty words per minute as an average seems

optimistic at the present time, not merely from the technical point of view, but also that of obtaining the necessary business turn-over.

"The directors do not look with any greater favor than in the past upon the International Radio-Telegraphic Convention, which they regard as the result of foreign intervention following on their successful efforts in establishing a wireless service at sea; and it is pointed out that the select committee to which the question of ratification was referred expressed the view that, if the Marconi company was found to be injuriously affected by the ratification, they should be treated with a generous consideration quite irrespective of and without prejudice to their legal position.' The directors have, therefore, been carefully considering the course the company should adopt, and although very little is said as to the outcome of the deliberations, it appears that the board is about to modify its policy 'so as to arrive at arrangements which will not only be satisfactory to the governments concerned, but also remunerative to the Marconi companies.' It is noticeable that the share interests in the subsidiary Marconi enterprises, of the nominal value of £2,394,106. 10s., together with the five hundred and fifty patents owned by the company, are set down in the balance sheet at a value of only £244,966 9s. 6d. But the most important point is that the board will ask the shareholders to approve an issue of 250,000 seven per cent. fixed cumulative preference shares of £1 each, thus increasing the nominal capital to £750,000. This is a sting in the tail of the report which will not be comforting to the existing shareholders. These new preference shares will be entitled to dividend in priority to all other shares, and subject to the payment of a non-cumulative dividend of ten per cent. per annum on the paid-up ordinary share capital of the company, they will have the right to participate, *pari passu*, in proportion to the capital paid up, with the ordinary shares of the company in any profits not required for the payment of such preferential dividend. Except so far as this new capital, should it be obtained, may serve to improve the general position of the company, it is clear that the present shareholders have little prospect of any return upon their investment. Further, a large part of the new issue will be required to pay off the company's existing financial engagements, so that, after meeting such liabilities and the cost of issuing, it will not provide any very considerable working capital for expansion. Finally, the mystery of Mr. Cuthbert Hall is referred to at the end of the report, but is not cleared up. The net result, however, is that he has relinquished his position as managing director, together with any claims for commission, in consideration of a payment in cash and the allotment to him of 10,000 fully-paid ordinary shares in the company. Mr. Cuthbert Hall has since retired from the board, and we conclude that a new era in the policy of the Marconi companies has begun."

The Cable.

The new submarine cable between the Cocos Islands and Java is open for traffic.

Cable communication is interrupted May 13 with:

Venezuela	Jan. 12, 1906.
Hayti	Jan. 18, 1908.

All offices closed to International traffic except Cape Hayti, Mole St. Nicholas and Port au Prince.

Madura Island (Dutch East Indies) Feb. 3, 1908.

Mr. Herbert Taylor, acting superintendent of the Commercial Pacific Cable Company at Guam, where he has been located for the past five years, is now in New York on a vacation which will be extended over five months. After making a visit to Manchester, England, his old home, he will return to Guam. Although, of course, the island is an isolated spot on the map of the world, Mr. Taylor appears to enjoy life there, and is enthusiastic over its climate, which he describes as being well nigh perfect.

The Department of Commerce and Labor has been advised by cablegram from Special Agent Roland R. Dennis, who is in attendance as representative of the United States government upon the International Telegraph Conference, now in session at Lisbon, containing important information that business interests are not to be disturbed by a serious curtailment of the right to use codes in international cabling. The cablegram reads as follows: "Tone of the Conference is not strongly antagonistic to the large majority of existing code regulations. There is a feeling to prevent the use of unpronounceable combinations of letters now being supplied by codemakers. The British Post Office circular issued to Chambers of Commerce reads in part: 'The Postmaster-General thinks it desirable that the condition as to pronounceability be somewhat more clearly defined in order to put some limit for the future to a growing tendency which, if unchecked, cannot fail to produce results highly injurious to the telegraph service generally, and therefore to the public and to commerce.'" There is, however, no intention of adopting other than a wide and even generous interpretation which would cover the bulk of the codes at present in use.

The Telegraph Conference and Pronounceable Words.

The English Postmaster General has made a statement on the subject of the possible adoption of restrictive regulations with regard to code telegrams by the International Telegraph Conference, which assembled at Lisbon, Portugal, on the 4th inst. He points out that the privilege of using artificial "pronounceable" words on the footing of code at ten letters to the word was granted on the assumption that it would not be abused; but, unfortunately, many words had been submitted, such as BYWRGROCBX, which could hardly be

said to be pronounceable. A telegrapher could deal more rapidly and surely with a pronounceable word, which he could grasp and remember while transmitting, than with an arbitrary combination of letters, each of which required a separate effort of attention. He, therefore, thought it desirable that the condition as to pronounceability should be more clearly defined, in order to check this growing tendency, without, however, adopting an ungenerous interpretation of the condition.

Obituary.

Howard J. Bruce, aged forty-seven years, a Western Union telegraph operator at Richmond, Va., died in that city on April 18.

John T. Brophil, forty-four years of age, a telegraph operator, formerly well known in race-track reporting, died at St. Louis, April 7.

Charles G. Pond, aged fifty-five years, a member of the operating force of the Western Union Telegraph Company at Boston, died April 23.

An American telegrapher named Chablin was killed by the insurgents in Peru, on May 6, previous to the attack made by them on Cerro Pasco.

Joseph Crawford, aged forty years, a Postal telegraph operator at Pittsburg, Pa., committed suicide at that place on April 8. His home was in Philadelphia.

Charles H. Seiffert, a well-known operator in both commercial and railroad telegraph circles in Chicago, Memphis, New Orleans and Cairo, died at Moline, Ill., after a prolonged illness, on May 2.

John W. Mannion, aged forty-four years, a telegrapher connected with the Western Union Telegraph Company at Pittsburg, died at his home in Newark, O., on April 5. From 1888 to 1903 he was manager of the Western Union office at Newark.

Frederick H. May, aged eighty-three years, and who was vice-president and general manager of the American Rapid Telegraph Company during the existence of that concern, died, May 10, at his home in Newark, N. J. He had been prominent in railroad construction in the West and Middle West in the seventies, and won fame in the Civil War by keeping the Illinois Central north of Cairo open for troops and supply trains for General Grant. Mr. May was born on the Isle of Man. He had lived in retirement for many years past.

John F. Martin, aged fifty-six years, a former telegrapher, but for the past twenty years a stock broker in New York, died April 25. Mr. Martin was a native of New York City, and became a clerk in the Western Union cable office in 1870. He subsequently learned telegraphy and was an operator in the main office of that company until 1888, when he resigned to become a member of the Consolidated Stock Exchange. A few years later he became a member of the New York Stock Exchange, with which he continued to be identified up to the time of his death.

W. J. Murphy, aged fifty-nine years, vice-president of the Cincinnati, New Orleans and Texas (Queen and Crescent) Railroad, died, May 10, at Cincinnati. He began his career as a messenger boy in the service of the Erie Railroad, afterwards becoming a telegraph operator, despatcher, chief despatcher, superintendent and general superintendent. He resigned from the Erie in 1888, and after a short vacation became superintendent of the Eastern Tennessee, Virginia and Georgia Railroad, now a part of the Southern. From that road he went to the Queen and Crescent, and served it first as superintendent, and later as general manager. Five years ago he was made first vice-president. Mr. Murphy kept up an identity with telegraph interests by retaining his membership in the Old-Time Telegraphers' and Historical Association.

Governor Hughes Recommends State Supervision of the Telegraph.

Governor Hughes, of New York, in his message to the extra session of the legislature, convened May 11, had this to say in recommending the placing of the telegraph and telephone under the control of the Public Service Commission:

"The amendment of the Public Service commissions law by making suitable provision for the enlargement of the jurisdiction of the Public Service commissions, so as to bring telephone and telegraph companies under proper regulations, and also such other amendments of the statutes as may be deemed advisable in the light of the experience of the commissions, in order more fully to accomplish the purpose of the Public Service commissions law.

The policy of the state with regard to the supervision of public service corporations should be uniform and embrace all corporations of this character. Telephone and telegraph companies exercise important public franchises. The community should be protected against extortionate rates and machinery should be provided for an adequate supervision of operations and service. Issues of securities should be made only under appropriate public scrutiny, to prevent the evils of unwarrantable inflation. The state should protect its citizens from exploitation on the part of those who enjoy public privileges and undertake public service, while at the same time, by provision for thorough investigation and the careful examination of facts by an administrative board suitably equipped for this purpose, the evils of ill-considered and arbitrary action before the facts have been properly ascertained should be avoided. Justice to the community does not involve injustice to private rights. The provision of adequate means for the exercise of the state's authority of regulation, so as to insure the performance of public obligations in a just and impartial manner, is of the highest importance to the good order of the community and to the welfare of all the people. The state cannot afford to be lax in the exercise

of its supervisory powers, but they should not be exercised without due regard to the varying problems of numerous particular cases. The subjects of complaint in connection with the operations of public service corporations involve so many considerations, and demand such patient, expert and thorough inquiry that they cannot be dealt with to advantage through sporadic legislative action.

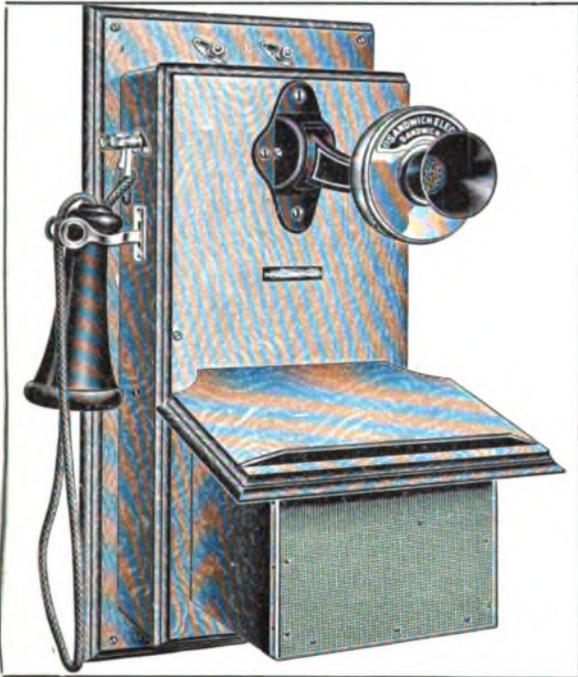
The plan which was adopted last year of establishing public service commissions has worked admirably, and, indeed, as an adequate scheme of regulation presents the only alternative to legislative action, which is manifestly not as well adapted to the just settlement of the great variety of grievances which must be dealt with separately and after investigation and are susceptible of a fair disposition only through a continuous administrative board. The plan should be made comprehensive, and now that the commissions have been organized and are in working order, it is proper that telephone and telegraph companies should be brought under their supervision. This may be made effective as early as October 1, 1908. Action now will save, at all events, many months, and, most probably, a year's delay in establishing this important jurisdiction.

Operators Who Have Been Successful.

Reading an article a few days ago, reprinted in the New York Herald, in 1891, from a Philadelphia journal, regarding the telegraph and its operating force of that day and generation, Mr. D. H. Bates, one of a group of gentlemen, was stirred to reminiscent review. Recalling the names of some former operators of the Quaker City, who in other fields of endeavor have since won for themselves place, recognition and substantial reward in the good things of life, and who when in the service were conceded to have had excellent all-around abilities as operators, excelling perhaps as senders, Mr. Bates, said:

"There were at this time some fine senders in Philadelphia, prominent among them being Robert J. Wynne, afterwards Postmaster-General and now United States Consul-General at London; P. Voorhees Degraw, now Fourth Assistant Postmaster-General; John A. Henneberry, now chief clerk in District-Attorney Jerome's office, New York, and E. C. Boileau, now with a Philadelphia broker. Here at New York, 'Wal' Leaming was my admiration; 'Ham' Young's sending was like copper-plate—never a break. Then, as now, he was located in Washington, where for years he has been the night manager of the Western Union office. Then there was John E. Zueblin, who was killed a few years ago when passing from one car to another on a train in Ohio—his Morse was fine, but his spacing was not so good. Fred. Catlin, who is still in harness, and who lives over in Brooklyn, was always a superb operator. How many there were! What an impressive list of names might be enumerated. Alas! where are they all now?"

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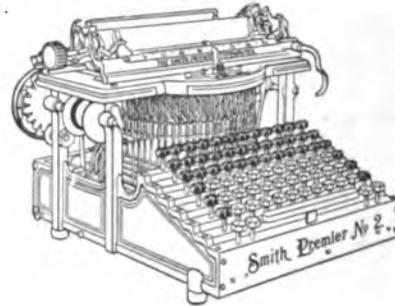
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NEW YORK, MAY 16, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been 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.

The Telegraph Bills in Congress.

The declaration made by George H. Fearons, general attorney of the Western Union Telegraph Company, before the House Committee on Interstate and Foreign Commerce, on May 5, conveys information of profound significance as to the character and relative percentage of the messages transmitted by telegraph in this country. Mr. Fearons appeared in opposition to a bill introduced in the House by William J. Cary, of Wisconsin, requiring telegraph companies to transmit with all telegrams sent the time of their filing. Mr. Fearons said that sixty per cent. of the telegraph messages of the country consisted of the transmission of business despatches, those emanating from exchanges, boards of trade, merchants, etc.; twenty per cent. might be credited to press mat-

ter, fifteen per cent. to railroad needs, and of the remainder, three per cent. to the sending of private and social communications. The exceedingly small number attributed to the latter, as an originating source, will doubtless be a surprise to many. Yet the figures named are no doubt substantially correct. Society, considered as a concrete proposition, contributes but a moiety to the support of the telegraph. It is clearly evident that the business interests sustain and are responsible for its well being. Without such maintenance the passing of the telegraph would be inevitable. Although criticism of the telegraph more frequently arise from within social circles than from any other source, the insignificance of its needs and consequent demands, as compared with the whole, is but as a drop in the bucket.

In stating the company's objections to placing the time of filing on each telegram sent, Mr. Fearons pointed out the hardships that would follow the operation of such a law, holding that its enactment would impose a grievous burden in the conduct of a business so vast in extent as that of the Western Union Telegraph Company. He said that on the basis of 74,805,000 telegrams, the number transmitted annually by his company, the additional words required for expressing the filing time would reach the enormous equivalent of 17,454,000 messages of ten words each. Such a statement made in answer to the carelessly considered proposition embodied in the demands that the passage of the House bill would enforce, is well calculated to arouse and hold close attention and cause careful deliberation of the subject involved on the part of the committee in whose hands the bill now rests.

No more deplorable spectacle has ever been witnessed in the annals of the telegraph than the effort now being made by a certain class of telegraphers to influence national legislation in a manner antagonistic to the telegraph interests of this country. The hearings that have been held by both the Senate and House committees of interstate commerce, to enable those who are responsible for the bills regulatory of the telegraph, to appear in their behalf, have not proved to be altogether enlightening exhibitions of high-minded and disinterested purpose. It may be considered questionable, indeed, whether the gentlemen constituting the committees have been sufficiently influenced by what the hearings have developed, to regard the passing of the bills as desirable. We hazard the opinion, based upon the equities dictated by common sense, that it will be a long time before the telegraph bills now in committee hands of both branches of Congress will be reported upon. The telegraphers have rather overacted their part in appearing in such a highly moral attitude of mind in an attempt to force coercive legislation upon the telegraph. Indeed, to a close observer the vision of a little halo might almost have been discovered gathering about the brows of the officials of the Commercial Telegraphers' Union, assembled before the committee, when it was

declared that the true intent of the bills which they advocated had "but one object in view and that was better service," each spokesman declaring in turn that the welfare of the dear public was the impulse that stirred his heart. Of course, all thought of vindictiveness of motive as exercising any influence in the proceedings is out of the question!

"The Importance of Legible Copy."

How relevant the question of the production of legible copy is deemed in the telegraph service has received abundant illustration since the appearance of the editorial in *Telegraph Age* on May 1, entitled "The Importance of Legible Copy." The article evidently struck a sympathetic chord in the managerial mind in general, for a number of letters have since reached us, not only expressive of approval, but also entering into a discussion of the "lost art," as one writer termed it. Commenting on the subject, W. C. Black, superintendent of the Postal Telegraph-Cable Company at Denver, Colo., wrote: "I believe the operators of to-day would exercise greater care in producing in neat form, and in transcribing messages correctly on the typewriter, could they but inspect some of the messages that were written with the pen by operators back in the seventies and early eighties. I have in my possession a number of such, and enclose for your inspection a few sheets of press report, made by George J. Carroll, of Detroit, and Mr. Kronenberg, of Toledo. Copy of this character was typical of much that was regularly produced in those days by numerous operators. It delighted the printer. I wish it might be produced in fac-simile to show the modern operator a style that was common in the old days. I recall with satisfaction many of these former 'masterpieces' that would do credit in their beauty of style and of their perfect legibility to a teacher of penmanship. New York, Chicago, New Orleans, Omaha and, in fact, all large cities, had elegant penmen among the operators in the time to which I refer. For my part, I would like to see some of the 'copy' made by such men as Barney De Kline, 'Bob' Cuppage, 'Jack' McRobie, 'Bob' Rattray, 'Jimmie' Largay and W. J. Quinn. We should be getting back to gracious and graceful first principles."

The Post Office Electrical Engineers' Journal.

"The Post Office Electrical Engineers' Journal" is the title of an English quarterly, of magazine form, the initial number of which was issued in April in London. It is the official journal of the institution whose title it bears, and in that capacity it stands representative of the telegraph and the telephone in Great Britain, the former of which in that country is under Government ownership, while the latter is rapidly passing under such jurisdiction. This first number which reaches us, and which gives abundant promise of being representative in the best sense of the subjects which it aims to discuss, contains a number of excellent articles

of a character which should commend the publication to the best practical and scientific thought of the professions indicated in the British islands. An engraving of Sir John Gavey, C. B., the first president, in 1905, of the Institution of Post Office Electrical Engineers, and who was formerly at the head of the English telegraphs, offers an attractive frontispiece to the journal. He also contributes a signed article entitled "Words of Welcome." Donald Murray has an article on the "Typewriter and Piecework in Telegraphy," in which he depicts the use of the typewriter by operators in America. There is also published an amount of social miscellany appealing to local interests. It appears by an accompanying circular, that a number of articles are in preparation for future publication, to be contributed by well-known writers, one by Sir Wm. H. Preece, K.C.B., being on "Pre-Post Office Telegraphs." The current issue contains eighty pages. The publishers are H. Alabaster, Gatehouse and Company, London, the price of subscription being four shillings.

Filing Time on Messages in Georgia.

The railroad commission of Georgia has passed a rule amending a former rule requiring telegraph companies to show the time both of filing and delivery of messages, by which the telegraph companies are allowed to charge two cents additional for all over ten words when the time of filing is shown.

The order is rule 3, and is as follows:

"Telegraph companies are required to show on each telegram they transmit and deliver between points in Georgia the correct time, expressed in hours and minutes, that such telegram was received at office of delivery. And where the sender of any such message desires to show also the correct time of filing with initial office, the transmitting company shall, where the words necessary to express the filing time added to the words in the body of the message do not exceed ten words, carry said information free. But where such words added to the words in the body of the message exceed ten words a charge of two cents per word for each word in excess of ten shall be allowed, subject to a maximum extra charge for showing said time of filing of five cents."

Maryland has enacted a law by which the telegraph companies are obliged to place the hour of filing on all messages.

The Telegraph in Austria.

At the end of 1906 the Austrian telegraph system aggregated 37,966 kilometers of State lines; 4,851 kilometers of railway, and 100 of private line, or a total of 42,918 kilometers. The total wire mileage of the three systems was 145,794, 68,828 and 323 kilometers, respectively, or a grand total of 214,945 kilometers. The system of State lines and wire increased during the year by 674 and 4,290 kilometers, respectively, that of the railways

by 14 and 1,571 kilometers, while the figures for the private systems were 100 and 322 kilometers. The wires are chiefly composed of iron. There were in Austria 6,409 offices open to the public, being an increase of 104 on the previous year; 4,026 were Government, and 2,360 railway offices. The number of offices represents one for every 46.8 square kilometers, and 4,080 inhabitants. A pneumatic system is working between Vienna, Prague and Carlsbad, the length being about 81 kilometers.

Mr. Vail Has No Objection to Public Control.

Theodore N. Vail, president of the American Telephone and Telegraph Company, in his recent annual report, presents an interesting analysis of the telephone business. Among other things he says:

"Any revenue produced over and above legitimate requirements and the proper reserve to provide for contingencies could be used for the benefit of the public, allowing the company to retain a part sufficient to stimulate the most efficient and economical management. It would be difficult, if not impossible, to get effective and economical management, such as would produce the best results for both public and the shareholders, without recognizing this principle." Also that "it is contended that if there is to be no competition there should be public control. It is not believed that there is any serious objection to such control, provided it is independent, intelligent, considerate, thorough and just, recognizing, as does the Interstate Commerce Commission in its report recently issued, that capital is entitled to its fair return, and good management or enterprise to its reward."

Poulsen on Wireless Telephony.

Prof. Valdemar Poulsen, the Danish inventor, read a paper before the Royal Institution in London recently on his system of wireless telephony, remarks the *Electrical World*. After detailing how he had succeeded in carrying the human voice through the air a distance of about two hundred miles, that is to say, between Copenhagen and Berlin, Mr. Poulsen is reported to have spoken as follows:

"The essence of my discovery is its simplicity, and it resulted from another discovery: I made several years ago that the rapid passage of electricity to and fro produces an effect known as the 'singing air.' This singing I found produced notes too low for the air to hear and some that were too high to be understood, so in order to make the notes understandable I arranged an apparatus consisting of coils of wire, joined in series to a condenser with leads to the source of the current, joined by two carbons in parallel.

"I found that the current flowed rapidly in the arc between the carbons, oscillating to and fro, and the oscillation was enormously improved by occupying the intervals between the carbons with hydrogen gas. This resulted in continuous un-

damped waves which can easily be tuned to any desired plan, so that they will only influence those instruments which are arranged to correspond with the sending instrument."

Coming to the pure telephone and efforts to establish wireless communication, Mr. Poulsen said that the waves that Bell had harnessed by the use of mirrors had proved to be without value, but with the undamped waves, each exactly like its predecessors, the problem had been solved. These regular waves transmitted sound perfectly, and by means of them it had been possible to telephone a tune, without wires, two hundred and ninety miles, and to make a human voice recognizable at a receiving station one hundred and seventy miles away from the person speaking. At the close of the paper some interesting demonstrations of the new method of communication were given.

An Australian Telegraph Invention.

Mr. William Leivesley, a postmaster in Queensland, has just patented all over the world a telegraphic invention of considerable interest. According to a foreign authority "the object of the invention is to provide circuits and a simple combination of apparatus and switching gear to facilitate the transmission of messages direct to their destinations, over long lines in a variety of directions, to a greater extent than has hitherto obtained; to permit any prearranged number of telegraph circuits to work with each other just as though they were one and the same circuit; to enable a number of stations on different lines, not ordinarily in direct communication, to communicate directly with each other without hand repetition. Hand repetition, and the delay, labor, and the possibility of mistakes incidental thereto, are also obviated or greatly reduced when an interruption on a line occurs. In newspaper messages the same news may be transmitted direct to its various destinations by one telegrapher by one operation of a telegraph key. The lines are relieved of the time taken up in receiving and transmitting at intermediate stations. The invention also allows of signaling four or more ways on the Morse system, and at the same time may embrace or combine other systems. It provides for repeating direct on to main lines, and different systems are also enabled to work together and interchange signals harmoniously. The great economy in the "diversifier" system is that the old systems, machinery and equipments of circuits, may be adopted to the diversifier in the internal wiring of offices and joining to the switchboard."

The practical side of the telegraph is discussed in every issue of *Telegraph Age* in a manner of interest and aid every individual operator in the service. Why not secure the benefits of such information by subscribing for the paper—\$1.50 a year.

For "The Honor of the College."

BY DR. L. M. RHEEM, OF MINNEAPOLIS.

Your editorial, "Thoughts for Reflection Affecting the Telegraph Service," in TELEGRAPH AGE of April 16, was read by me with the deepest interest. The article is true and timely. A man with no axe to grind can sometimes say things in a way that gives them weight with those to whom they are directed, which he could not do were he on one side or the other in the controversy.

While I may be classed as a "rank outsider," having no right to "butt in," I believe it to be my plain duty, as well as the duty of other men occupying a like position, to say a word on the subject of your editorial. I regard myself as a member of the telegraph alumni, and look upon the telegraph as my alma mater, for the reason that it was in that service that I first acquired a knowledge of the basic principles of all business, saw the necessity of an education, and had aroused in me, by the precept and example of the educated gentlemen then constituting the very large majority of the rank and file, an ambition to be able to do my future work for the work's sake, instead of for the sake of a job.

In this respect I am neither a prodigy nor a curiosity, for in less than ten minutes time one can call the names of more than a hundred men occupying positions of honor in all the professions, conducting or controlling large business interests in all activities of the age, and entrusted with the administration of affairs on which the destinies of the governments of the world depend, who received their first training in the same school.

While I have not gone as far as some of these gentlemen have in the accumulation of the goods of this world, I look on their preferment with no feelings of envy; rather am I proud of them, proud to be even in a small measure in their class, and proud of the telegraph through which they were given to the world.

Their very existence and the history of their achievements should be an inspiration to better things for every employe of the telegraph, and should be made one of the prime factors in the abolishment of the labor union, which, in my judgment, has no place in the profession.

I don't know who the misguided individual was who gave us the nonsensical jingle "In union there is strength," nor whether he intended it to apply to all kinds of unions; if he did, it has been conclusively demonstrated by the three telegraph strikes that "In union there is not strength."

When I see one of these elaborately designed affairs with signs, passwords, grand this, or grand that, walking delegates, organizers, or what not, as well as an elaborate ritual for the "initiation" of dissatisfied, incompetent workers, I feel like saying, "Boys, forget it! That craft goes to the Port of Nowhere, and it never arrives; in a short time it is a water-logged derelict, menacing and

destroying the property of the honest skippers on the ocean of commerce."

I never like to hear a man criticise anything unless he has something better to take its place. Well, I have something better to offer; and if you want to know what it is I will tell you. The prescription has been tried a thousand million times, and it has cured every time.

Before prescribing for the ailment of a patient, it is necessary to make a diagnosis. That is an old Greek word, and it means "I know." To diagnose the case before us, we require the services of no expert diagnostician; a tyro can see that the malady is Ignorance and Pessimism. Either of these alone is bad enough, but together they are very serious. Both embody the destructive principle. Ignorance comes from the old Latin "Ignoramus," meaning "we know not;" pessimism comes from the Latin "Pessimus," meaning "the worst," and "Pestis," meaning "an infectious disease."

They belong to the shadows and the darkness, to the bludgeoner and the assassin; they have no place in the light of the present day. Neither of them ever built anything, not even a chicken-coop. They never have made, and never will, make an honest dollar for any man.

In all the pages of the history of the world, no good act is recorded as having been performed by ignorance or pessimism. They sent Jesus of Nazareth to the cross, and Jacques de Molay to the stake. They have consistently obstructed the advancement of the seven liberal arts and sciences, have throttled invention, destroyed governments, leaving chaos, ruin and misery in their wake.

For an illustration, we need go no further than our own Morse, the fruit of whose inventive genius was made the butt of the so-called congressional wits, ignoramuses in disguise. The first message of the telegraph, "What hath God wrought," should be the key-note in the action of the telegraphers of to-day; "What hath God wrought," an illumination of the creative principle, a typification of the builder. Ignorance and Pessimism can not, and should not be permitted to travel in such grand company.

No, boys, this thing will not do; you have had given in your charge the traditions of one of the noblest professions in the world, a profession whose fundamentals carry one straight into the very heart of the universe; a profession through whose hands passes the expression of every emotion of the human mind, and which occupies the position, in a large measure, of conservator of the destinies of the human race. The "honor of the college" has been entrusted to you and you must keep it untarnished.

What? "You don't get enough salary?" That has nothing to do with the question, I am not talking of telegraph companies, I am talking about the Profession of the Telegraph. Just you forget your miserable, petty squabbles with those companies, get yourselves in condition and in line for

better things, and the salary question will be solved before you realize it.

"How can you do it?" I'll tell you. Get rid of your ignorance as quickly as you can and uproot that pessimism even to the faintest little rootlet. To illustrate how you may do this I will tell you a story.

In the early seventies, I knew a telegraph office in which there were eighteen or twenty operators employed, the business handled by it was intricate and required skill of a high order. A large amount of the business was code cables and messages, in which a large number of words were used whose meanings were unknown to the operators handling them. Now, while they could handle these messages without knowing the meaning of the words in them, they "wanted to know," so they chipped in and bought a Webster's Unabridged Dictionary. Thereafter, when a new word made its appearance, it was quickly memorized and given a place in the educational equipment of the ambitious boys who simply "wanted to know." As is the case with every one who wants to know, these boys were not satisfied with this knowledge alone. The Franco-Prussian war was then in progress; in the press news of each day from the seat of war, new towns and cities were mentioned as the different armies moved, as well as the names of new generals on both sides.

The boys chipped in again and bought a large atlas and an encyclopedia, for the purpose of securing full information of these places and men. By the time the war was over, the boys not only knew exactly where the places were located, but knew all about their principal industries, how many persons they employed and where they sold their products. They not only knew who the different generals were, but how they came to be generals; they not only knew the generals, but their relatives, where they lived and what they did for a living. If a message had been handed to one of those boys with instructions to deliver it to either Bismarck, von Moltke, Bourbaki or Bazaine, it would have been delivered without asking a question, for he would have known exactly where to find the gentleman in the shortest possible time.

Well, what came of this? One of the boys became, on account of his general knowledge of things, private secretary to the Secretary of War, studied law, and, before he died, made a place for himself of which he had reason to be proud. The very first piece of legal business he did, was to draw my "last will and testament" for me, just to see, as he said, "whether he could draw a will that would stick." I still have the will; and whenever I look at its beautiful chirography, its carefulness of detail and its correct legal phraseology, I think with affection of the genial kindly gentleman whose first training was received in the "College of the Telegraph." Others of this company reached distinction as writers, authors and business men, and those of them who are alive to-day still "want to know."

While the class of knowledge here outlined is useful as a preparation for business apart from the work of the telegraph, you should not stop with that; in fact, you should begin by learning what you don't know about the telegraph business. See how many things in the following list you don't know, and then make it your first business to learn them:

How to receive a message at the counter; find the tariff and check it properly; how to make up a money order; how to account for a message; how to make up the different reports of an office; how to get the message to the operating room; how to route it; how to classify it for transmission; how to transmit it in the most workmanlike way; how to prepare it for delivery; how to deliver it; how to place a message on a receiving blank so that it "balances" the blank and impresses its addressee with its clean-cut arrangement. I have two typewritten messages before me now, received in the last few days, which an operator should not allow to go out; their make-up is slovenly, spacing irregular, capitalization disregarded, and a general air of carelessness and "don't care" about them that makes me wonder whether they are really correct. These things, you will say, are too simple to bother with, and belong to the managerial and accounting departments. Well, don't you want to be a manager some time? Or would you rather be the "ice man," with just enough knowledge to crack off a chunk, flip it across the lawn and yell "I-c-e?"

To go still further—see if you know how to set up a simplex, duplex, quadruplex, printer, ticker, Wheatstone, Barclay, or Rowland; how to install and manage a dynamo plant; how to test wires; how to find and kill a "bug"; how many wires enter the switch boards of the office; how many follow different routes; where the testing stations are; how to "patch" a wire and how to handle the different wires in the most economical way.

How will you learn all this? It is easy enough. The first time you have an hour to spare, instead of wasting it in bewailing your condition and criticising your employers, drop in to see the manager; tell him that you would like to acquire a knowledge of bookkeeping and reporting of the office and ask him if he cannot give you a chance to do so. He will likely tell you that he cannot increase his expense in that department, as it has already been criticized by his superintendent. Tell him to forget it, that there will be no expense about it, that you just want to learn how to do it, and are willing to work your way.

Now, the manager may faint, or he may discharge you on the spot; at any rate he will grant your request in the end and will keep you in mind. The chances are that the first time he gets confidential with his superintendent he will tell him "what a funny thing" happened the other day when Brown came in and wanted a chance to learn

about the accounts of the office. It will tickle the superintendent, and he will keep his eye on you, and one of these days when he wants a manager in a hurry you are quite likely to be "it."

Then, after you have trimmed up the manager, go after the chief operator or division chief; tell him that you would like to know how to handle your own quad and duplex sets; that you have noticed that a good deal of time is wasted each day in waiting for him to come and balance the set; tell him you would like to do a little extra work for nothing in learning the switchboard and testing; offer to borrow some books from him; tell him you "just want to know." Read the regular article in TELEGRAPH AGE, entitled "Some Points on Electricity," in which Willis H. Jones is endeavoring in a careful, painstaking way to show you the road to salvation.

About the time you have finished these stunts will be the time for you to break into the superintendent's office, if you are at district headquarters; strike the chief clerk and tell him you have heard of a "semi-annual" that he makes up; tell him you would like to come around and help out on it if you could, just to know what it is; get acquainted with that wild-eyed estimate clerk, who is a walking wonder of maps, poles, wires, cross-arms, cables, conduits, manholes, cost and methods of construction; tell him the same thing, that "you want to know." Now, don't you worry about these men not being willing to tell you what they know; they will do it all right, for the reason that they have been waiting a long time for a man who wanted to know and would listen and learn.

Then go around to the office of the superintendent of construction; he knows a lot of things that you should know: they are all interesting and useful. He is usually a little crusty from having come in contact with so many farmers having original ideas on rights of way across their fields, but if you convince him that you want to know, he will tell you all about it. In going through this "freshman" term, you will see a great many side lanes and by-paths that are full of various kinds of knowledge; you cannot stop to explore them all, but you can make a note of them and go back some day when you get around to it.

Now, let us suppose that you have hived all this knowledge, and have not been promoted—have not even had your pay raised. That would appear as though there were some flaw in the scheme, would it not? Not at all; you were not doing this for a salary; you were doing it because you "wanted to know;" now that you do know you can make Mr. Ignorance look pretty foolish when he goes round telling people that he still lives in your house; he is "on the block" and he does not know it.

Well, I will tell you what to do next; take a vacation. That is, dress up pretty spruce and take a walk through the business district; watch for the names of firms and individual whom you have no-

ticed as sending a very few messages or no messages at all by your company; make it your business to get acquainted with the manager of the concern, and go after him for business for your company. Don't be afraid of him; he looks pretty fierce, but you are just as good a man as he is, and you know a whole lot of things that he does not know. He will likely tell you a story of hard luck he experienced through your company, and that he would not send a message with that set of robbers under any circumstances. You tell him that the things he tells you are some of the very things that have been corrected; tell him you want him to try it again; that you work the wire that would handle his business and that you will give it the very closest attention; tell him that you want his business because it will help you more than it does the company; make it a personal matter with him, and don't let it rest with one call; keep after him. Then tell the manager of your office that you have been talking to a friend of yours about giving the company his business, and that he is going to do it. Follow this line of work through this "vacation," and note the result.

One of three things is bound to happen—you will either have your salary raised, be promoted to a more responsible position, or one of those clean-shaven, clear-eyed, hustling business men will say to you: "Say, young man, I want you to go to work for me. You have the qualities I need in my business." I do not know whether your old company would let you go or not; if it did, it would part with you with the kindest feelings, and you could go back to it any time you wished to.

I do not know what the policy of the presidents and general managers would be in relation to a man or set of men who would really work for the company, but judging from the way they have taken care of the large number of men who have worked in this identical way, I believe their policies would be satisfactory to all concerned. I have some old-time friends perilously near the top of the telegraph ladder, and every time I see one of them negotiate an additional rung it makes me feel good, for I know that they are keeping the old traditions and the "honor of the college."

Boys, try it; get in line; play ball.

Somewhere about the time indicated a few paragraphs back, you will make a queer discovery; you will remember that you started to get rid of Ignorance and Pessimism, and that by just helping other people you have lost them both; and in their places you have installed Knowledge, Enthusiasm and Fidelity—a grand trinity.

Do you know what enthusiasm means? It is from the two Greek words "en" and "theos," and it means "I have a God within me." Fidelity comes from the Latin word "fidelitas," and it means "Faith," the first of the magnificent triumvirate that rules the world, and who brings in her train her two beautiful sisters, Hope and Charity.

What a pitiful thing a man without Faith is!

With no faith in the future, with no faith in his fellowmen, he has no faith in himself, no ideals, no visions; he has no conception of his place in the grand scheme of the universe, and his worth cannot be indicated by the cipher, which is the pythagorean symbol of infinity and eternity.

What a monstrosity a man without Hope is! Groping in the shadows and the darkness, with his face turned to the depths, he hears no message from the empyrean, calling him to the better life.

And a man without Charity!

Though I speak with the tongues of men and of angels, and have not charity, I am become as sounding brass or a tinkling cymbal.

And though I have the gift of prophecy, and understand all mysteries, and all knowledge; and though I have all faith, so that I could remove mountains, and have not charity, I am nothing.

* * *

Charity suffereth long and is kind; charity envieth not; charity vaunteth not itself; is not puffed up.

Doth not behave itself unseemly, seeketh not her own, is not easily provoked, thinketh no evil.

* * *

Beareth all things, believeth all things, hopeth all things, endureth all things.

Charity never faileth; but whether there be prophecies, they shall fail; whether there be tongues, they shall cease; whether there be knowledge, it shall vanish away.

* * *

When I was a child, I spake as a child, I understood as a child, I thought as a child; but when I became a man I put away childish things.

For now we see through a glass, darkly; but then face to face; now I know in part, but then shall I know even as also I am known.

And now abideth faith, hope, charity, these three; but the greatest of these is charity.

Boys, you cannot change by one jot or tittle, the philosophy of the ages; it was given to us at the dawn of creation; its precepts and messages have been repeated to us by Moses, Solomon, Jesus of Nazareth, Confucius, Buddha and Mahomet, whose followers in all parts of the world are trying, each in his own way, to see the light and bring the brotherhood of man.

In this indescribably wonderful century, these precepts are being amalgamated with and utilized by the thinkers and planners of the business world; it may be said for a selfish reason; this may be true at the start, but even the practice of them in the pure abstract will soon bring the full melody that comes from the soul.

There is a legal fiction saying that "a corporation has no soul." This has been quoted freely of telegraph corporations, but it is the purest fiction. These corporations each have a soul; a great big virile soul, because it is made up of the souls of the splendid men who have the direction of the corporations' affairs. But, they also have "a charge to keep;" that, in its last analysis, is a sacred one; a part of it is "The traditions of the telegraph and the honor of the college."

Will you help them keep this charge? If you will, you will soon find and realize their souls. If you will not, but still insist on "sowing the wind,"

blame no one but yourselves when you reap the "whirlwind."

Now, I should like to know whether I am alone in my way of thinking? I should like to know whether I am a dreamer, a visionary, and "seeing things?" I should like to know how other members of the "alumni" feel about this question? I know of a number on whom I could call and whose names I could give, but I am going to call only upon two, although in so doing I am taking an unwarranted liberty, as I have never met either of them and am totally unknown to both. But their faces, as they have appeared in the public prints, are familiar to me as well as to all; their splendid careers starting from the common walks of life, through the "College of the Telegraph," through their magnificent benefactions and works for the benefit of civilizations and of their fellow men, have been an inspiration to me as well as to others. You know their names even before I write them. Will Mr. Andrew Carnegie and Mr. Thomas A. Edison from their rich experiences of the past, their knowledge of the present and the innate kindness of their hearts, take a few minutes time to tell these boys whether I am right or wrong in asking them, in begging them to fit themselves to keep and preserve "The traditions of the telegraph and the honor of the college?"

Municipal Electricians.

Patent No. 451,902, for a fire-alarm telegraph apparatus, held by J. W. Stover, of Newtonville, Mass., has expired.

William S. Riehl has been appointed superintendent of the fire alarm telegraph service of Cincinnati, O., to succeed his father, the late Louis F. Riehl, who held the position for many years. The salary is \$2,000 a year.

A patent, No. 884,607, for a telephone fire alarm, has been granted to William S. McLewee, of Yardley, Pa. Diagram of circuits adapted to telephone subscribers in order to give a fire-alarm signal over usual telephone circuits.

Once more the fire-alarm system in New York City has been severely condemned. Superintendent Martin, wire chief of the fire department, at a hearing before the Commissioners of Accounts on April 30, stated that the whole alarm system below Fifty-ninth street was likely to be rendered useless at any moment. Mr. Martin described the working of the system, its inauguration, and its history. He also explained how the system had been added to from time to time as the city's fire limits extended. He called attention to the fact that the system had never been designed for a city of New York's magnitude. The condition of the trunk lines below Fifty-ninth street, he said, was especially bad, particularly in and around police and fire headquarters.

This is a good time to begin a subscription to Telegraph Age, \$1.50 a year.

Some Suggestions From the "Call Boy."

A writer in the *Electrical Review*, who describes himself as a "call boy," makes the following interesting contribution:

If you can hear above the clatter of the telegraph instruments and care to chat a few moments with the night call boy, all right. I like to read of Edison, who went up the grade like a sleek passenger engine, who with energy and nerve gave the throttle a couple more notches and plunged on and on in the darkness over an unknown track. They say he is an old man now, and I suppose he will die and I will never get to see him, but his achievements can never be forgotten. Here are his inventions all about the office. We pin carbon paper about the incandescent lamp so it will not shine so bright. There is the quad wire, two messages going each way at the same time; two counter-currents working through a neutral relay, says the operator, but I don't understand that. There is the carbon transmitter on the telephone, with which I saw one of the head men talk to New York City. There are relays, repeaters and condensers. Two Edison bipolar dynamos in the powerhouse one block away have been pulling the street cars for the past seventeen years, since 1891; just six years after the first electric street car system was built in America at Brooklyn. Two smaller bipolar machines supply the incandescent lights: one Brush and two General Electric machines have been added of late years. Yet great as Edison was and is, and as hard as he worked, serving us faithfully even in the autumn days of his life, he could not do it all. Kelvin, Bell, Tesla, Brush, Thomson, Roentgen, Hewitt, Marconi and a score of others seem to parallel his lines.

What electrical invention is more commonly used and is as far-reaching as the telephone? What does it mean to the call boy? It means this much—that if a few more of the trainmen had telephones the call boy could be dispensed with. I often call a train, engine and crew of five men in six minutes. An hour later a big freight train of forty cars goes thundering through the town.

About a year ago a train was held up about thirty miles south of here, one passenger being killed. The lady operator handed me a typewritten copy giving full particulars twenty minutes after the hold-up. Almost the same moment our special agent (detective) came in to get full information. I never even asked how he got the news so quick. I called the chief of police of this city (Fort Scott, Kan.), and read him the message. Then I called the constables of the smaller surrounding towns and advised them. Then the despatcher asked me to get an engine and bloodhounds started to the scene of the robbery as quickly as possible. I called the chief of police again and a number of parties in town, but it seemed that no one had bloodhounds or knew where there were any. Then it occurred to me that I could call up farmers on the farmer lines, so I began ring-

ing up some old-time hunters down on Drywood, eighteen miles away, several of whom live in the hickorynut jungles that extend for half a mile on either side of the river. However, I did not locate bloodhounds, but the other fellow did by the same method, and they were hurried to the scene of the robbery and killing. Just calling anybody and everybody within a radius of twenty miles! How impossible this would have been one hundred years ago! Let us listen a moment to the telegraph instrument. St. Louis is talking to Pueblo on one wire. The despatcher is calling down a young operator on another. "What do you mean by guessing at train orders?" he says. But I must not tell stories out of school.

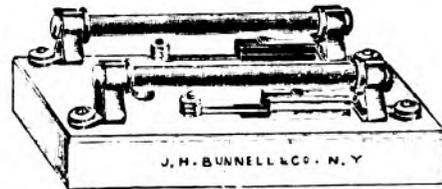
The Barclay Lightning Arrester.

John C. Barclay, assistant general manager and electrical engineer of the Western Union Telegraph



SINGLE POLE SET.

Company, New York, has patented a lightning arrester and protector for telegraph and telephone lines, which has been adopted as its standard by the company named. It is manufactured exclusively by J. H. Bunnell and Company, Inc., of New York, in both single and double pole form. The device, which is illustrated herewith, showing both forms, embodies some original and peculiarly effective features in construction, results reached after



DOUBLE POLE SET.

many years of experience and study of the subject and its needs on the part of the expert telegrapher whose exponential idea it is. The fuse caps are provided with flanges which prevent the fuses from being shaken out of their holders even when placed in a vertical position and when there is much vibration.

Colonel Plum narrates in his "Military Telegraph in the Civil War," that a telegraph line repairer who was highly expert in the use of climbers, was trimming trees at that time in Danville, Ky., preparatory to the stringing of a telegraph wire. An old woman who had watched his operations as an intensely interested spectator, subsequently, in relating the incident, said: "What can't them Yankees do! One of 'em just walked up and down the trees like a devil."

Simultaneous Telephony and Telegraphy.

Francis R. Hoyt contributes an interesting article on simultaneous telephony and telegraphy in "Telephony," in which he explains, in part, by describing a "method to supply the so-called railway composite instruments to railroad companies for their private use on the telegraph lines operated by them. In many ways this is one of the most wonderful circuits ever put into practical use, as it can be added to any quadruplex circuit, and permits of four separate and distinct telegraph messages and one telephone communication to be in progress at one time over one grounded telegraph line, and that without introducing objectionable interference between the different circuits. This system is very efficient when used on grounded telegraph lines, and has been applied in some cases to lines over one hundred and fifty miles long.

"Another condition under which the telegraph has proven itself an adjunct to the telephone company, when operated by the latter, is in the case of a heavily loaded toll line, that is, a toll line which at certain periods of the day or night is so congested with calls that every minute lost by operators in making appointments, getting parties, up, etc., means dollars to the telephone company. If the telegraph is brought into play, appointments can be made, parties held, and, in fact, all the preliminaries of a future call, as well as all checking of past calls, can be done while the line is being used for actual conversation.

"In addition to these points of advantage to the telephone company there are numerous reasons why firms doing a private telegraph business, and especially brokerage concerns who furnish stock market quotations, desire the class of service offered by telephone companies. First of all, because the telephone side of the duplex means dollars to the telephone company, and in the case of a break down they exert every factor possible to restore service immediately, so that when faults of this kind occur the time which elapses in the interval is infinitesimal as compared with the time required by a telegraph company in restoring service under similar circumstances.

"The fundamental principles of simultaneous telephony and telegraphy are, in a few words, as follows: (a) You can telegraph through an impedance but not through a condenser, and (b) you can telephone through a condenser but not through an impedance. Simultaneous telephony and telegraphy is not new. In fact, there appears in the records at Washington a patent dated as early as May 7, 1878, covering what is to-day the first step in one of the most elaborate systems in use. This circuit is nothing more than a grounded telegraph line with condensers bridged around the telegraph relays or actuating apparatus to permit of the free passage of the voice currents. Though this circuit in its day was a wonderful advancement in telephony it had its drawbacks when put into practice, and in reality it is not a simultaneous circuit, as

it was only intended to use the telephone at such times as the telegraph was idle. This, however, could be remedied by a proper arrangement of connections, but in that case we would encounter several drawbacks; chief among these being that for ringing purposes a high frequency current would necessarily have to be used, because to ring with a magneto or generator one side would have to be grounded and the current from the other side would chatter all of the relays whenever applied to the line, thus interfering with any signals which might be in transit at that time. The system was never adopted as a commercial branch or addition to the telephone or telegraph office, but it thoroughly demonstrated the fundamental principles as outlined, which proved the stepping stone for other great minds; and as a natural sequence there followed our present day simultaneous telephony and telegraphy systems. The railway composite used to such an extent all over the country to-day is merely an elaborate form of this simple circuit.

"We may say that simultaneous work is divided into four classes, which are as follows:

"First, simplex circuits, that is, a circuit by which one telephonic and one telegraphic communication can be transmitted over one metallic telephone line.

"Second, composite circuits, or circuits by which two telegraphic and one telephonic communication are made possible without the least interference over one metallic circuit.

"Third, quadruplex circuits, which render four telegraphic and one telephonic communications not only possible, but of the highest commercial efficiency, and when properly installed and balanced, give equally as good results as either the simplex or composite.

"Fourth, railway composites, so termed because they are merely telephone circuits added to the telegraph lines usually operated by railway companies, so that they can despatch their trains, or, in fact, conduct any business quickly and privately over lines already doing manifold duty and without paying a toll or having any additional maintenance cost. No matter how heavily loaded the line may be nor how old the iron wire, it is possible to secure a good conversation over distances of from one hundred and twenty-five to one hundred and fifty miles, and never know you are talking over a line carrying telegraph messages, provided the line is well insulated with respect to the ground.

"Simplex circuits in turn are divided into two main branches, i. e., those using repeating coils at either end of the line with the telegraph tap taken off of the line side of the coil, and those using a retardation coil with the telegraph tap taken off of the center of the coil. Both of these circuits are used extensively by long distance companies throughout the United States, some using one and some the other. In most cases it depends entirely upon the amount of telegraphic work they intend doing or will be able to do, which circuit they adopt. Primarily each has its advantages

over the other, but from a commercial point of view, that is, as regards transmission, the retardation coil simplex has a shade the better of the two circuits, and can be rung over a considerably greater distance."

The Belin System of Telephotography.

A new method of reproducing pictures at a distance by electric currents over a connecting telegraph wire has recently been discussed in telegraphic and photographic circles. The method has been devised by M. Edouard Belin, of Nancy, France. It depends upon the fact, according to the *Electrical World*, that a photographic film of bichromate gelatin loses its power of swelling in water after it has been exposed to actinic light. Such a photographic film, after being exposed, developed and fixed, presents a rugged surface or variable contour, the ridges or salient points, which have swollen most, corresponding to the darkest portions of the picture, and the valleys or deepest points being those which have received the brightest lights. The photographic print is mounted on a revolving drum at the sending station, and a stylus rides on its surface like the pin of a phonograph. The up and down movement of the stylus as it rides across the ridges and valleys, corresponding to the light and dark streaks of the picture, are mechanically magnified and serve to operate a small but effective rheostat so as to modify the current in the line circuit. At the receiving end of the line is a synchronously driven cylinder. A small but strong beam of light falls on this revolving drum and produces a controlled photographic action on the sensitized drum surface. The variations in line current produce corresponding variations in luminous intensity in a rather ingenious manner. Each of the two cylinders makes about eighteen revolutions per minute, and the pitch of the helical thread is one-sixth of a millimeter. Consequently a strip three millimeters wide will be reproduced in each minute. A picture 9 x 12 centimeters is said to occupy about thirty minutes in transmission.

Up to the present time the apparatus is only described as having been tried either on short lines or on artificial lines. Nevertheless, it is to be hoped that the apparatus will be developed so as to be capable of operation on actual lines of ordinary length, if only to show what can be accomplished in the art of accurate telephotographic reproduction. It is of course no novelty at this date to reproduce pictures in some manner over a telegraph line. There have been, in fact, a number of such telepictorial methods suggested and tried at different times during the last sixty years, the efforts of one inventor after another having come to fruition and to record apparently without attaining commercial application. Two distinct types of operation have been employed, namely, electromagnetic and electrochemical. In both methods the receiving pen has operated in synchronism with the transmitting pen. Selenium transmitters and contact-makers, mechanical,

chemical and electrochemical, have all been tried at the sending station. So far as we are aware, however, the up-and-down motion of a stylus upon photographically indented paper has not been brought out before. The reason that none of the preceding methods of fac-simile teleprinting has come into use is that there has not been sufficient demand for the operation of telereproduction of pictures to make the effort worth while. Any such method naturally involves skilled manipulation, and in the past there has been no demand for the commodity sufficient to overcome its cost in expert service and in telegraph line toll. There are many other possibilities in this category. For example, it has been demonstrated many times that it is quite practicable to communicate with moving railroad trains by means of electromagnetic induction from neighboring telegraph wires suspended in the ordinary way, near to and along the railroad line, but the method seems never to have come into commercial use, because it does not pay to employ a special operator on board a train when a telegram can always be forwarded from the next stopping place.

The Delay of Telegraph Messages in India.

It appears that the object of the Indian Government in appointing Mr. Newlands of London, of the British telegraph, to investigate and report upon the telegraph service, was to find and remove the cause of the great delays experienced in the transmission of telegrams in India. While in England 91.7 per cent. of the messages are put on the wires within ten minutes of their receipt, in India only 8.2 per cent. come within this limit, and no fewer than 57.6 per cent. are delayed over forty minutes. The delay, according to Mr. Newlands, is mainly due to unnecessary signaling operations, the compiling of useless returns and the inefficient organization of the hours of work. The new scheme of duties will not only accelerate the dispatch of business, but will also reduce the amount of night work.

As a result of negotiations with the Indian Government, the strike in the telegraph service has come to an end, and the men have returned to work, to carry out a five weeks' trial of the new system of watches. The Government has appointed a special committee to investigate the alleged grievances of the telegraph staff throughout India.

In going over a list of over one hundred men who now hold important positions in the railway service of this country, a number among them who have reached presidential offices, only seven in the entire lot began at posts endowed with any sort of authority. Ninety-three began at the lowest round of the ladder, simply as boys—office boys, water boys, messengers, shop apprentices and the like. The telegraph was well represented in the list, and proved to be a potent stepping stone leading to the very highest positions attained in executive management.

The Military Telegrapher in the Civil War.

PART THREE.

Among the archives of Col. William R. Plum, of Lombard, Ill., the historian of the part the military telegraphers sustained in the Civil War, is a letter from John N. Brooks, who wrote to the Colonel from Nashville, Tenn., under date of April 14, 1879, at a time when the former was busily engaged in preparing his book for the press. He gives with much graphic detail the incident of a fight occurring at Gallatin, Tenn., when the Confederate colonel, John H. Morgan, surprised and captured the small Federal garrison at that point. So far as the affair concerned the telegraph, we take from Mr. Brooks' original story, the following, of date August, 1862:

"It was an exciting event when Colonel John H. Morgan, the noted Confederate guerilla chief, surprised and captured the town of Gallatin, Tenn., early one morning in August, 1862, overwhelming in his attack the small Federal force there stationed. The conduct of the raid was characteristic of the man whose quickness and daring and ability to turn up with his bold riders at wholly unexpected times and places, and at widely separated points—actions which were a constant menace and source of anxiety to the Union leaders.

"At the time mentioned I was agent and telegraph operator at Gallatin, of the Louisville and Nashville Railroad Company, and also filled the position of express agent, all interests being centered, after the customary manner, in the depot building. In the same structure on the floor above, I occupied a room which was set apart as my bedroom. About daylight on the morning in question I was partially aroused from a sound slumber by the heavy tread of some one mounting the stairs, but thinking in my half conscious condition that it was the porter, I simply turned over for a further nap, and paid no attention to the approaching footsteps. My equanimity as to what was going on, however, was short lived and rudely disturbed, for suddenly bursting in at the door a stranger, in rough garb appeared, closely followed by a second, both of whom, doubly armed with heavy navy pistols, cocked and pointed at my head, demanded my surrender in the name of Colonel Morgan. Raising up in bed I recognized the first man as John A. Ellsworth,* the famous telegraph operator who had attached himself to Col. Morgan's command. I have always recognized that discretion is the better part of valor. Moreover, Ellsworth's reputation had preceded him, and when I replied with alacrity to his fierce order, with an uncompromising, and, I fear, meekly uttered, 'Certainly,' I

* George A. Ellsworth, who served as Col. John H. Morgan's chief telegraph operator during the Civil War, was possessed of an extensive and expert knowledge of the telegraph. It was a toss up with him which side he should serve, North or South, for he was a foreigner and without pronounced prejudices, but deciding in favor of the latter, he went into the service with all

well knew what the consequences would be were I to refuse or even hesitate. War takes few chances under such conditions, and no denials.

"Ellsworth commanded me to get up and to get into my clothes. When I had reached the stage of putting on my pants, he abruptly broke in and asked me whether I had any money. When I said that I had a little, he once again brought his formidable looking-pistol into requisition and told me to "shell out." The command was peremptory and no dodging was permissible, and I quietly handed over my pocketbook, from which he extracted and counted out forty dollars, all it contained. Handing back the empty purse he asked me if that was all the money I had, and when I disclaimed the ownership of any more he cursed me for having so little. I was ordered to finish dressing and then to accompany my captor downstairs into the telegraph office. Once in the office he demanded the keys to my desk, opening which he proceeded to ransack, the first thing pounced upon being a package containing money, about thirty-five dollars, as I remember. It was addressed to a lady resident of Gallatin, and had been received from the express company but the evening before. Nothing was sacred to the big thief in whose power I was, for he clutched at this money and eagerly stowed it away in his capacious pocket, in company with my forty.

This self-banking operation concluded, and a further search of the room revealing nothing else of portable value, he directed me, with an oath, to cut in the telegraph instrument and find out where the trains were. This I did, for to disobey meant instant death, but conducted my actions in as awkward a manner as possible, my object being to convey the impression to the operators along the line that something was wrong at my office. Ellsworth, than whom there was no more expert operator, evidently became suspicious of me, for he finally placed me under a guard of ten or twelve men, and took charge of the telegraphing himself, at the same time trying to imitate my writing. But he apparently made a bad mess of it.

"At this time, it being now about seven o'clock, Mr. Culp, who kept the hotel across the way, just opposite the depot, and with whom I boarded, came in to notify me that breakfast was ready. I remarked that my environment was of such a peculiar nature just then that I didn't see how I could well go unless my guards would accompany

of his well known energy. His versatility, restless activity, good judgment, and daredevil proclivities, combined with his pronounced abilities as a telegrapher, well qualified him for the task he assumed and made him a valuable acquisition to Colonel Morgan. During the war he was continually furnishing the Federal army specious, yet false and misleading information over telegraph wires, which he frequently tapped, respecting Colonel Morgan's movements, thus enabling his commander to execute many maneuvers, to the chagrin and discomfiture of his Northern opponents. Mr. Ellsworth was a Canadian. He died at Antonia, La., November 27, 1899, while in telegraph employ, being found dead in his office with one hand resting on the key.

me. Ellsworth remarked with a grim smile that we would all go, that his little party would, no doubt, do full justice to the hotel proprietor's table, and that he would lock up the office until our return. On our way out, it was necessary to pass the stairway leading to my room. Taking advantage of the opportunity afforded, I asked permission to go up and wash my face. The request was granted, but reluctantly, and with the injunction to 'hurry up.' I had secreted in my bed a pocketbook containing five hundred dollars, the result of long saving, and the first large sum of money I ever possessed. To obtain it I was naturally anxious. As good luck would have it, none of my guards showed any disposition to accompany me aloft. The pocketbook had not been disturbed and hastily glancing inside to see if the money was safe, I quickly slipped it inside of my bootleg, dashed a little water on my face, in order to keep up the deception, and then hurried back down stairs. I considered myself as extremely fortunate in securing the money and that no suspicion was attached to the errand to my room.

"After breakfast, of which my captors partook as if famished, and to the evident dismay of Mr. Culp, whose viands disappeared with marvelous rapidity, we returned to the office, where I was still kept under close guard by direction of Ellsworth, who again took charge of the telegraph instrument. After he had worked some time, and asked various questions regarding the whereabouts of trains, 'Jimmy' Morris, the depot operator of the road at Nashville, one of the brightest men in the profession, mistrusting that something was wrong at Gallatin, finally put the question whether I had received the bottle of 'nitric acid' he said he sent me a few days before. Ellsworth turned to me and wished to know if I got the acid. I promptly told him that I did not. Pulling out his pistol, always ready for instant use, and which he cocked and aimed at me, he exclaimed that he would shoot the top of my d—d head off if I lied about the matter. I replied that he had me in his power and could kill me if he chose, but that I knew nothing whatever about any 'nitric acid.' My positively uttered answer appeared to be satisfactory, for Ellsworth immediately resumed the key and assured 'Jimmy' that he had no knowledge of any nitric acid having been sent. This reply convinced 'Jimmy' that something wrong was up, for it was only a few days previously that he had sent me a bottle of whiskey, which bore the nitric acid label, affixed purposely, in order to trick the boys and keep them from drinking its contents, as otherwise they would have been sure to have done. Furthermore, I had made due acknowledgement of its receipt.

"As a matter of fact, when Ellsworth questioned me about the 'nitric acid,' I had quite forgotten, under the excitement of the moment, that the bottle of whiskey was so labeled. If 'Jimmy' had requested to know whether I had received the whiskey, undoubtedly I would have answered that I

had, so that my reply at the time may be said to have been innocent of all guilt. Subsequently I recalled to mind the fact of the original label, but prudently held my peace, for I knew very well that it would never do to contradict the statement already made. But 'Jimmy' was not to be deceived; he and I had worked together too long; moreover he recognized the touch and felt satisfied that it was Ellsworth with whom he was talking. Then he let out on the Confederate operator, calling him everything that mortal man could think of. It was a tongue lashing long to be remembered. Ellsworth seemed to enjoy the situation, for he sat at the instrument and laughed immoderately at the volley of epithets that came directed to him over the wire, while I stood by under guard listening to the conversation, tickled at what I heard, and hardly able to suppress a laugh myself, yet at the same time not knowing what was to become of me.

"Poor 'Jimmy' was in bad health at the time and left Tennessee and the telegraph shortly after this episode. I learned subsequently that he went to sea for a whaling voyage. I never heard from him again.

"My guards continued to keep a strict watch over me until about ten o'clock that morning, when Washington Morgan, a cousin of Colonel Morgan, made his appearance, and immediately ordered my release. Taking me with him outside on the street, he informed me that I should not be harmed, but that on no consideration was I to leave the town. It was easy to secure my acquiescence to this injunction, a matter, indeed, in which I couldn't help myself. This matter settled, he grew confidential and requested to know where he could get a drink of 'Robinson County whiskey,' that being a staple beverage in Tennessee at that time, as it is even to this day. My acquaintance with the town served me in good stead, for the 'conversation water' was readily obtained at a place on the public square. My new-found friend, having sufficiently quenched his thirst, we became quite sociable, and returned to the depot together, he showing every disposition to treat me kindly. His interference, however, in my behalf, did not secure me from suffering from further spoliation at the hands of the marauders, for when, a little later, I again visited my room, a new twenty-five dollar coat and a number of shirts were missing. Yet with my life spared and the five hundred dollars safe in my boot leg, I concluded that a philosophic view of the situation was the correct one, and that, under the circumstances, self congratulations should prevail, rather than bemoaning the comparatively small loss I had sustained."

"Lightning Flashes and Electric Dashes," a book made up of bright, ably written stories and sketches, telegraphic and electrical, that should find a place in the home of every telegrapher; 160 large double-column pages; profusely illustrated; price, \$1.50, carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Wireless Editor's Troubles.

Making a "wireless" newspaper is not an easy task. According to a writer in the New York Evening Post, the editor of a daily paper on board one of our modern ocean liners sometimes has a strenuous time of it in getting enough news together to fill the white columns. Dependent upon reporters thousands of miles away "at the other end of the ether," the editor has little choice save to twirl his thumbs and wait upon the pleasure of his wireless informants.

In telling of Herr Rabien, editor of the Ocean Gazette on board the Kronprinzessin Cecilie, and his troubles with reporters, the writer gives an amusing account of how difficulties are sometimes bridged. There are good wireless reporters and bad wireless reporters. There are some, according to Herr Rabien, whose color sense or whose flow of words is of just the proper sort. There are others whose ideas, or facts, rather, flow turgidly.

"Now, that Cape Cod operator," he will say, "ah, he is bad—very bad. When he sends news I must write more to it myself. But Poldhu is good, excellent, and Cape Race, but at Nantucket—I should like to hang that man. He adds to my troubles."

Here is an item of news sent out by an American wireless man:

"Bryan made a fighting speech in Carnegie Hall. The text of his speech was 'Thou Shalt Not Steal.'"

The editor swore over this, because other news had been short. He wrestled with the question an hour, while the paper waited. More matter—copy—was needed. Then—Eureka! He added from the storehouse of his fund of common sense: "Bryan was indorsing all the policies of Roosevelt, and bitterly attacking the Trusts."

That would have been all very well had not Poldhu fallen down in the interim. It did. Here was the despatch.

"London people are suffering from a mild type of epidemic influenza."

Herr Rabien swore again. With space to fill, here was a pitiful contretemps. No death list; no peculiar feature—no details at all. Bah! He thought of treating it humorously; a bit of verse, perhaps; but he could find nothing to rhyme with London, and nothing with influenza, except possibly Venezuela, and even that rhyme had its limitations.

He had to let it go. Space still yawned. At the height of despair came the following:

"At least twenty-four soldiers of the foreign legion perished in the heavy snowstorm of February 2." An inspiration here. A French paper of a date a week back lay on his desk. Here was a brief report of an engagement between French and Arabs, in which 500 sons of the desert were killed. Herr Rabien merrily dragged that in, neck and crop.

This was so good that the editor took an hour off for rest and recreation. When he returned

he faced a fresh crisis. No news had come in, and the hour of going to press was at hand. There were still several inches to fill.

He went over all the despatches and stuffed them full of words, as his chefs at the moment were stuffing their capons. Still space remained.

Action was necessary. He went out on deck and interviewed an officer. When he returned he sat at his desk with a pleased smile and turned out a page of copy as follows:

"Moonset to-night at 11h. 35m.

"Sunset to-day at 4.56 p. m.

"Sunrise to-morrow morning at 6.55 a. m."

Then followed figures telling the passengers how many times they would have to walk about the deck to cover a mile. There was still a hole left. Even the paragraph showing how many feet there were in a land mile and a sea mile failed.

The consideration of showing how many feet there were in several thousand sea miles as a means of covering paper with printed figures suggested itself, but there was not time to compute that.

Despair! Then, just as the paper was going to press with a gaping blotch of white in the star-board column, the following came in:

"Lost! A gold veil-pin with pearls. If found, please return to the steward or to Room No. 438."

Herr Rabien seized it gratefully. He could have shaken the hand of the loser of the pin. He inserted it, and then placed a cut of an eagle below it. The hole was filled.

The Telegraph in Colombia.

The Department of Posts and Telegraphs of Colombia has extended the contract made in 1906 with Francisco J. Fernandez for the construction, repair and operation of the federal telegraph and telephone lines, for a period of five years, beginning with January 1, 1908. According to the agreement, the contractor must maintain the present lines in good repair and furnish material and apparatus for future construction, according to the terms laid down. He must also introduce the German type of Hughes instrument and establish a school for instructing operators in the use of this instrument, and also in the operation of wireless telegraph apparatus. At the end of five years the entire system is to be turned over to the government in good condition.

Extraordinary progress is being made in the telegraph extensions in Brazil. There are at the present time 60,000 kilometers of telegraph lines, including the coast and river cables; of this the government owns 27,349 kilometers, with 3,331 stations. Recently a new line of 2,100 kilometers has been erected between Rio Janeiro and Cuyaba on the River Madeira.

Insulation Tests—Milliammeter Method.*

It is customary to make periodical tests of the insulation resistance of telegraph and telephone wires. Up to a few years ago these tests were made with the tangent galvanometer almost exclusively, but with the advent of direct-reading voltmeters and milliammeters, quicker and in every way more satisfactory methods for making tests were found.

The milliammeter furnishes an accurate and ready means of making these measurements, the results of which are directly figured out by Ohm's law. The simple method of making the tests is where the wires are all open at the distant station. The wire chief then quickly inserts his meter in first one and then the other, applying an appropriate battery until he has run through the entire number of wires on that particular pole line. All wires are grounded, except the one under test. This is to not only measure the amount of leakage between the wire under test and earth, but also any leakage which may exist between it and any of the other wires.

The test is ordinarily made with a double-scale milliammeter, employing the most sensitive coil, which usually records on the lower scale. This lower scale is usually calibrated in divisions of .2 milliamperes (or .0002 ampere). Suppose that with a pressure of 100 volts a deflection of two divisions on "lower" scale is noted. This would denote that a current of four-tenths of a milliamperes (.0004 ampere) was passing out to the "open" wire from

100 volts' pressure. Then, by Ohm's law, $R = \frac{E}{I}$;

hence $100 \text{ volts} \div .0004 \text{ ampere} = 250,000 \text{ ohms}$, which would represent the total insulation resistance of the wire. In considering this test the mileage insulation resistance is always reckoned, and this is arrived at by multiplying the length of the wire in miles by the total or absolute insulation resistance. Assuming that the wire in this instance is 200 miles in length, then the insulation per miles would be 50,000,000 ohms, or 50 megohms.

* Extract from "Electrical Instruments and Testing," by Norman H. Schneider, written by Jesse Hargrave, a superintendent of the Postal Telegraph-Cable Company.

The Telegraph and the Desert Menagerie.

The following anecdote, says a telegram from Cairo, Egypt, is at present making the round of semi-official circles in Khartoum.

A little while ago a young telegraph operator was sent to a lonely station in the remote regions of the interior. From the small cabin which served as his dwelling and his office he could hear the roar of lions from a distance. This having occurred several times during the few days after his arrival, he became very much terrified, and despatched the following message to headquarters: "Impossible to live here. Surrounded day and

night by lions, elephants, tigers, rhinoceroses, hyenas, wolves, crocodiles, hippopotami, etc.; beg for transfer."

Two or three days elapsed, and the poor, besieged operator received no reply, which increased his uneasiness. Another official, who was stationed in the same district paid him a visit shortly after this, and the terrified operator related to him his woes and showed him the telegram he had sent. His visitor commiserated him, but pointed out that the list of wild beasts detailed in the message was a little exaggerated, as no wolves exist in the Sudan. Immediately another telegram flew over the wires to headquarters from the forlorn operator at the far-away station, and the following was its wording:

"Referring to my message No. X please cancel the word 'wolves.'"

When the last man left it was not known whether the forlorn operator had had his request granted. His earnest desire for accuracy certainly merited some consideration.

Condensed Signal Outfits.

The signal office of the United States army has recently perfected a field telegraph apparatus which is condensed, so to speak, into such small bulk as to be carried easily by a soldier on foot or on horseback. It occupies a small wooden box about a foot and a half long, and is in effect a complete telegraph station suitable for service in a campaign.

More remarkable yet, however, is a contrivance, weighing only five pounds, which comprises both a telegraph and a telephone outfit. The telegraph instrument is contained in a leather case no bigger than the kind required to hold a pair of ordinary field glasses, and in a small cylindrical box attached to it is an instrument which is a combined telephonic transmitter and receiver.

When an officer of the signal corps, or an enlisted man, wishes to use the telephone, he simply removes the lid of the leather cylinder, takes out the instrument, which unfolds, and applies the receiver to his ear—an action which brings the transmitter close to his mouth. Whether one is on foot or on horseback, this five-pound apparatus—the weight mentioned including the leather cases—may easily be carried slung over the back, so as to be ready for use at any moment.

Commenting on the 'round the world telegraph experiment recently made by a newspaper in Copenhagen, Ferdinand Wagner says in a Berlin paper: "There was nothing wonderful in the result. Two messages were sent by the editor to himself at Copenhagen. One went via Shanghai, New York and London and the other via London, New York and Shanghai. The first to arrive at its destination was the one which was sent east by way of Shanghai. It had to be retransmitted eight times, and was received at the Copenhagen office in three hours and twenty-three minutes after it had been sent away."

FROM TELEGRAPH KEY TO MULTI-MILLIONAIRE.

A Sketch of Francis T. F. Lovejoy, of Pittsburg, Who Became the Business Associate of Andrew Carnegie.

BY ERNEST ROWE.

(Reprinted by permission from Leslie's Weekly.)

A visitor to the little town of Washington, O., in 1869, might have seen, if he had stepped into the village telegraph office, a tall, lean, brown-haired young fellow busily spinning off the dots and dashes. The initials which were signed to the messages were "F. T. F. L." The boy who delivered the telegrams, swept out the office in the morning, etc., could have told you that these letters stood for Francis T. F. Lovejoy, who had lately come to town from Maryland. The little office, scarcely more than eight by twelve, was not particularly inviting. Besides the table, on which were the telegraph instruments, and the small wood stove, which usually needed the touch of a feminine hand, there were just two chairs—one for the operator and one for the boy. In fact, the man at the instrument did not hesitate to make it known that loafing was not desired, and hence he did not provide any inducements by way of extra chairs or soap-boxes. Yet he was always courteous to strangers, though there was little possibility that the latter ever dreamed that they were talking to the future secretary of the Carnegie Steel Company or to the future president of the Sunnyside Mining Company; yet such was the case.

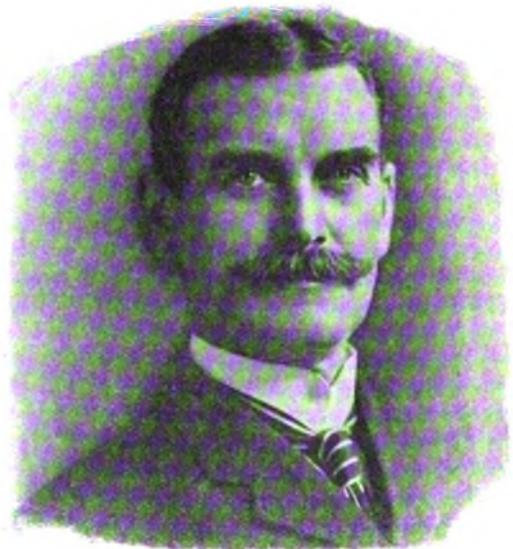
Mr. Lovejoy was born in a Southern farmhouse, on the outskirts of Baltimore, on July 21, 1854. Along with the other boys of the neighborhood, he attended "the little red schoolhouse" and learned his three R's. Later we find him at the little telegraph office in Washington, drawing a monthly salary of all the receipts of the office up to twenty-five dollars. The weekly business scarcely ever amounted to more than five dollars, so he was not burdened with the size of the amount he had to forward to the telegraph company. The errand boy gave his services in return for instructions in telegraphy.

Leaving Washington, O., in 1870, Mr. Lovejoy went to a place of the same name in Pennsylvania, and was employed in the same business. For a short time he was "night man" on the Oil City (Pa.) Derrick. At another time he was employed by an oil operator, Alfred Bronson by name, to look after an oil refinery at Miller's Farm—a hamlet ten miles south of Titusville.

In 1880 Mr. Lovejoy went to Pittsburg, working at his old trade of telegraphy until he finally associated himself with Carnegie Brothers, who even at that time were well-known steel manufacturers. On speaking recently of Andrew Carnegie, Mr. Lovejoy said: "He first impressed me as being a very little man to be as big as he

was." This association with Mr. Carnegie was destined to be of the greatest business value to Mr. Lovejoy. The latter was rapidly given more and more important work to do. He rose to be chief clerk of the company in 1882 and auditor in 1889. Shortly after he was made auditor, he was elected to the board of directors, and was given the office of secretary. In 1892 he had charge of the organization of the Carnegie Steel Company. With two others he, in 1900, arranged the consolidation of the Carnegie interests into the Carnegie Company. This company, by the way, was the model after which was patterned the United States Steel Corporation. When the task of consolidation was completed, Mr. Lovejoy left the Carnegie Company to devote all his time to his private enterprises.

It was when Mr. Lovejoy had full charge of the manufacturing costs of the Carnegie products



FRANCIS T. F. LOVEJOY.

Once a Telegraph Operator, but now a multi-millionaire.

that he began to hunt for something where the cost of marketing was reduced to a minimum. Often, in the steel business, it cost as much to sell the product as it did to manufacture the same. Naturally his thoughts finally turned to gold mining, for which product there is always a good market. It takes no commercial travelers to sell gold. It is the only product that sells itself. In 1902 a piece of mining property was offered to him, and after a most careful examination it was purchased. Since that time Mr. Lovejoy has spent over two millions dollars in developing this property and securing additional territory. To-day the Sunnyside mine is one of the biggest gold mines in the world. The most valuable lesson Mr. Lovejoy learned from his association with Mr. Carnegie was that secret of the latter's success—the ability to surround one's-self with men who know everything about their special line of work. Two things Mr. Lovejoy

knows how to do—how to keep the manufacturing cost down and how to select men who know their business from A to Z. He has also been fortunate in having associated with him in the management of the Sunnyside mine men of the same sterling qualities as himself.

If Mr. Lovejoy had asked you to join him in the steel partnership with Mr. Carnegie and you had put a few thousand dollars in with him, you'd now be one of the "steel millionaires." Of course, you didn't have a chance, but perhaps Mr. Lovejoy will give you a chance to become one of his associates in the Sunnyside mine. Of this I cannot say for sure. But I do know it's an awfully alluring chance, and the best way would be to drop a line direct to Mr. Lovejoy, No. 50 Broadway, New York City. Tell Mr. Lovejoy something about how you are fixed financially—if you can invest with him a few thousand dollars or only a hundred or so. Then, if there is no more Sunnyside stock for sale, he will at least write you a personal letter telling you so. If, on the other hand, there is yet a chance to become associated with Mr. Lovejoy in this greatest of all his great endeavors, he will advise you how you may join him without a very great outlay. It is well to remember that opportunities to join real live millionaires in their enterprises do not come one's way very often. Also when these millionaires put their money into a venture they know absolutely in advance that the venture is going to be successful.

Do you suppose Mr. Lovejoy would have spent two million dollars on the Sunnyside mine unless first he had determined the exact worth of the property? Not much. To-day a man may determine the worth of a mineral property which is developed as accurately as one may measure dry-goods or weigh flour. Mistakes are not permissible nowadays. So, before the Sunnyside mine passed into Mr. Lovejoy's hands, every test known to modern science was put to it, and the property was not found wanting. This is characteristic of Mr. Lovejoy's business method in regard to any proposition—first an excess of critical caution, then either reject or accept it; if the latter, back it for all it's worth.

When Mr. Lovejoy bought the Sunnyside, it was but a prospect, but now, after his five years of development, it is the biggest gold deposit in the world. Does any one deny this? I think not.

Mr. B. H. Revonlds, superintendent, Central and South American Telegraph Company, New York, in renewing his subscription, remarked: "Telegraph Age needs no praise at my hands; it speaks for itself."

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

The New Postal Office at Seattle.

The Postal Telegraph-Cable Company's Seattle office moved into handsome new quarters on the evening of April 21. The new location is at 732 First avenue, corner of Columbia street, in a four-story brick structure, which will be known as the Postal Telegraph Building. The floor space covers 2,675 square feet, providing ample room for all departments. The fixtures are oak, finished in dark color, with desks to match, and present a handsome appearance.

The manager, cashier, receiving and delivery clerks are in full view of the public, so that business can be transacted with great convenience. The superintendent's office, booking department and operating room are separated by glass-paneled partitions, the arrangement bringing out admirably the rich color of the fixtures.

In the operating room the wiring and equipment has been installed in a creditable manner by Division Electrician H. C. Shaw, of San Francisco. An oak switchboard case eight feet high and seven feet wide encloses a 24-wire main board and loop boards. Behind the switchboard is placed the coil racks and cross-connecting frames conveniently arranged for accessibility and light. A 50-wire cable enclosed in piping leads to the terminal frame in the basement. All inside wires and cables are enclosed in pipes. A dynamo bench has been provided for the three 380-volt and two 40-volt motor generators, while the 120-volt leads are taken direct from the power lead. Over the motor generators a handsome piece of Alaska marble, ten feet long and two feet six inches wide, on which the dynamo switches are conveniently arranged, adds to the attractiveness of the main switchboard.

The tables are Postal standard and provide space for four quadruplexes, two duplexes, four sets of Weiny-Phillips repeaters and twelve single Morse sets. A blower carries the messages between the operating room and delivery departments.

A feature of the new office is the window-sign arrangement. An enlarged facsimile Postal blank on the First avenue side has proved a great attraction and is admitted to be the most original window sign in the city. On the Columbia street side is placed the Postal trademark in enlarged form, which presents an artistic appearance.

Mr. E. J. Nally, vice-president and general manager of the company, under whose direction the office was planned, was a recent Seattle visitor, and was greatly pleased with the new quarters, which he considers the best on this coast. The location is ideal for a telegraph office, and credit is due Mr. J. A. Forehand, district superintendent, for his efforts in having the room arranged to suit the necessities of an up-to-date office.

The official personnel of the office is as follows:

J. J. Dunne, manager; R. S. Clarke, cashier; E. S. Eller, chief operator; H. C. Bunting, night chief; C. D. Clarke, all night chief. Fourteen operators are employed, exclusive of the chiefs.

The First Message By Telegraph.

A recent despatch from a town in Illinois said: "Leander Critchfield, one of the oldest printers of this country, who received Morse's telegram, 'What Hath God Wrought?' when it was sent to Baltimore on the first official trial of the telegraph, is dead. Critchfield was at that time a compositor in a Baltimore office, and his 'take' happened to include the article describing the trial of the telegraph."

The statement, says the Indianapolis News, is doubtless untrue. The same claim has been made by other "old printers." A well known member of the craft in this city says he personally has known four or five who have made it. The story has too many heroes, though they are nearly all dead. The truth is that the telegram referred to was not sent to the press nor to any newspaper, but to Mr. Morse's partner, Alfred Vail, who was operating at the Baltimore end of the line in connection with Morse at the Washington end to demonstrate the practicability of the invention. The inventor was not sending any despatches to the newspapers nor trying to exploit his invention in the press. He was wholly intent on making a practical demonstration of it.

The "first despatch" has an interesting history. During the years that Professor Morse was trying to get Congress to make an appropriation to test the feasibility of his invention the United States commissioner of patents was the Hon. Henry L. Ellsworth, of Connecticut. He was the father of Henry W. Ellsworth, for many years a resident and lawyer of this city, and was himself for several years a resident of Lafayette, Ind. He was an able man, a warm friend of Morse and a believer in his invention. The younger Ellsworth, Henry W., was of counsel for Morse in some of the big law suits connected with the telegraph patents. The elder Ellsworth was one of Morse's best friends in the long struggle to get an appropriation from Congress. In a letter to a friend written after the bill had passed Professor Morse wrote: "I watched with intense interest the progress and vicissitudes of the measure, through the House and then through the Senate. I had staked all I possessed on the issue. After much tantalizing delay the vote was taken in the House amid many attempts by ridicule to defeat the measure, which finally passed by a small majority. The amount of business before the Senate rendered it more and more doubtful, as the session drew to a close, whether my bill would be reached, and on the last day, March 3, 1843, I was advised by one of my Senatorial friends to make up my mind for failure, as he deemed it next to impossible that it could be reached before the adjournment. The bill, however, was reached a few minutes before midnight and passed. This was the turning point in the history of the telegraph. My personal funds were reduced to the fraction of a dollar and, had the passage of the bill failed from any cause there would have been little prospect of another at-

tempt on my part to introduce to the world my new invention."

Professor Morse sat all of the last day and evening in the session in the Senate gallery hoping to see his bill come up. Shortly before midnight, convinced that it would not be reached, he left the capitol and went to his hotel, dispirited and almost broken-hearted. He had written to A. R. Vail, his partner, that "if the bill should fail in the Senate I shall return to New York with less than a dollar in my pocket." One can imagine the frame of mind in which he went to his hotel that night believing that his bill had failed in the Senate. As he came down to breakfast the next morning a young lady entered and coming toward him with a smile exclaimed: "I have come to congratulate you." It was Miss Annie G. Ellsworth, daughter of the commissioner of patents. "Congratulate me for what?" said the professor. She answered: "On the passage of your bill." The professor assured her it was not possible, as he had remained in the Senate chamber until nearly midnight and the bill was not reached. She then informed him that her father remained until the close, and in the last moments of the session the bill was passed without a division. The professor was overcome by the good news, and while shaking the young lady's hands he assured her that she should send the first message over the line when it was built.

The appropriation having been made, the construction of the line to Baltimore was begun as soon as possible and pushed with energy. The Whig national convention was to meet at Baltimore, May 1, 1844, and a great effort was made to have the line completed by that time, but without success. By May 1 the line was open from Washington to Junction, 22 miles, and news concerning the convention, obtained from passengers on the cars, was telegraphed from Junction to Washington, beating the cars by nearly an hour. This was regarded as a great achievement. The line was completed to Baltimore on May 23, and on the 24th Professor Morse invited a number of his friends to assemble in the chamber of the Supreme Court and witness the first test.

True to his promise, he had invited Miss Ellsworth to be present. For the first message she offered, "What hath God wrought?" The whole verse in which the words occur (Numbers xxiii, 23) reads: "Surely there is no enchantment against Jacob, neither is there any divination against Israel; according to this time it shall be said of Jacob and of Israel, What hath God wrought?" Professor Morse was a profoundly religious man, and the message pleased him greatly. It was sent by Professor Morse himself in the old-fashioned dot and dash alphabet, which he had invented. It was received by Mr. Vail in Baltimore and returned instantly to Washington. Professor Morse said afterward: "This despatch baptized the American telegraph with the name of its author," meaning that God was its author.

The strip of paper on which the telegraphic char-

acters were printed was claimed by Governor Seymour, of Hartford, Conn., then a member of the house, on the ground that Miss Ellsworth was a native of Hartford. It was delivered to him by Miss Ellsworth, and is now preserved in the Hartford Museum. There is no contemporary evidence that a copy of it was sent to any newspaper.

Two days after Miss Ellsworth's message was sent, on May 26, 1844, the Democratic national convention met at Baltimore. James K. Polk was nominated for president, and Silas Wright of New York, for vice-president. The latter at that time was in the United States Senate, and in Washington. His nomination was immediately wired by Mr. Vail to Professor Morse in Washington, and by the latter communicated to Mr. Wright. In a few moments the convention was astonished by receiving a message from Mr. Wright that he respectfully declined the nomination. The president of the convention read the message aloud, but the convention refused to believe it was genuine, or that news of Mr. Wright's nomination could have been sent to Washington and his answer sent back to Baltimore in so short a time.

The convention therefore appointed a committee to go to Washington by rail and get Mr. Wright's reply, and then adjourned till the next day. When the committee returned and reported that the message as sent by telegraph was genuine, and that Professor Morse had sent it at the personal request of Senator Wright, the convention was astonished beyond measure. A committee was appointed to confer with Senator Wright, and Professor Morse arranged for an interview by telegraph. At this interview only the two operators and the parties immediately interested were present. Several confidential messages were exchanged, and the committee finally reported to the convention that Senator Wright was inflexible. The convention then nominated George M. Dallas, of Pennsylvania. This incident was a great triumph for Morse and a big advertisement for the telegraph.

The line between Washington and Baltimore, opened by Miss Ellsworth's message on May 24, 1844, was operated and exhibited without charge until April 1, 1845. Congress during the session of 1844-'45 appropriated \$8,000 to keep the line in operation one year, and placed it under the supervision of the postmaster general. In order to test the profitableness of the enterprise he established a tariff rate of one cent, for every four characters made by or through the telegraph, that is, one-fourth of a cent for every letter or figure. This was the through rate between Washington and Baltimore, and there was no intermediate office. The rate took effect April 1, 1845.

During the first four days of April the receipts of the Washington office were one cent. On the fifth the receipts were 12½ cents. The sixth was Sunday. On the seventh the receipts ran up to 60 cents; on the eighth to \$1.32; on the ninth to \$1.04. From April 1 to October 1 the total ex-

penses of the line, including the salaries of two operators, were \$3,295, and the total receipts were \$413.

In view of these figures Congress declined to make an appropriation to extend the line to Philadelphia and New York, and also declined an offer of the entire invention for \$100,000. The postmaster general, in his annual report for 1845, expressed belief in the usefulness of the telegraph as a means of transmitting intelligence, but doubted whether it would be financially successful. Yet he thought it should not be left in the hands of private individuals. "The operation of the telegraph between this city and Baltimore," he said, "has not satisfied me that, under any rate of postages that can be adopted, its revenues can be made to equal its expenditures. Its importance to the public does not consist in any probable income that ever can be derived from it; but as an agent vastly superior to any other ever devised by the genius of man for the diffusion of intelligence, which may be accomplished with almost the rapidity of light, to any part of the republic, its value in all commercial transactions, to individuals having the control of it or to the government in time of war, could not be estimated. The use of an instrument so powerful for good or for evil can not with safety to the people be left in the hands of individuals uncontrolled by law."

Book Review.

"The Telegraph Instructor," by G. M. Dodge, manager of the Western Union Telegraph Company at Valparaiso, Ind., in its fourth edition and revised form (1908; pp. 260), sustains its past reputation as a teacher in the field it essays to cover, and keeps the book well abreast with the never-ending needs of both the commercial and railroad telegrapher for an academic volume of this character. It is admirably designed for the student, for in explanation and illustration it is clear and profuse. Its rules for correct type-writer fingering, applied more especially in conjunction with message receiving, are illuminating. The work should prove a welcome addition to the student—literature of the subject with which it deals. The price of the book is \$1, and it will be sent postpaid to any point. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

We desire to state that back numbers of this paper, those issued more than six months prior to any current date, will be charged for at the rate of twenty-five cents apiece when they can be furnished. This price is fixed because of the necessarily limited stock we carry, and of the difficulty we sometimes have in filling an order. Oftentimes the request is for papers of a more or less remote date, with the expectancy of being charged at but ten cents a copy, whereas in order to obtain the desired issue we are ourselves frequently obliged to pay the larger sum, or even more. The growing value of complete files of TELEGRAPH AGE should cause our readers to carefully preserve their issues.

The Evolution of the Telegraph Alphabet.

BY DONALD McNICOL.

(Manager at Salt Lake City, of the Postal Telegraph-Cable Company.)

A person might well be pardoned for not observing at first sight that the Morse telegraph alphabet is a scientific arrangement of dots and dashes, composed with the object of providing short signals for these letters which occur most frequently in English words. And also, with the object of arranging letter signs sufficiently dissimilar to prevent, or at least lessen, the likelihood of confusion.

Steinheil, of Germany, in arranging an alphabet for his needle telegraph, invented in 1834, found it necessary to compose a code made up of dots only, and that, without being able to take advantage of spaces. The alphabet as used by Steinheil permitted messages to be sent at the rate of six words per minute.

The invention of the Morse electro-magnetic telegraph in America in 1837, permitted of the employment of an alphabet composed of dots, dashes and spaces, and many different arrangements were proposed having for their object the formation of all required letters, figures and symbols having the greatest number of variations with the given elements; with single signs, $2 = 2$; with two signs, $2^2 = 4$; with three signs, $2^3 = 8$; with four signs, $2^4 = 16$; so, by using variations of from one to four of the two elementary signs we have $2 + 4 + 8 + 16 = 30$ variations for the formation of an alphabet. The length of a dot being the unit, the length of a dash equals one dot, between two letters of a word three dots, and between consecutive words six dots.

The formation of numerals in the International alphabet is quite ingenious, each being represented by five of the two elements, so that by disregarding the dashes on the right-hand side and giving a value of unity to a dot and two to the dashes on the left, the value of the figure represented is expressed.

The International alphabet as originally used in England had a number of signs which have been gradually discarded.

At the Berlin Telegraph Congress, held in October, 1851, the present International alphabet was compiled. The alphabet as it stands was supposed to embody the best features of all the then existing alphabets. The Germans and Austrians added the following letters to the code as adopted by the convention:

Ch ———— Ö ———— É
 Ä Ü Ñ ————

As an evidence of how various alphabets were picked over to form the International code it might be stated that the signs for the letters G, F, L and R were taken from Gerke's alphabet; E and H from Steinheil's. The letter X, the numerals 1, 2, 3, 4 and 5 from that introduced by M. Lefferts on the American Bain lines in

1849, while the numerals 6, 7, 8 and 9, also taken from the Bain alphabet, were arranged in reverse order. The remaining characters were adopted from the Morse alphabet.

The United States army uses the Morse code generally.

As to the advantages of one alphabet over the others it might be said that the Morse alphabet which is exclusively used in America, is more rapid than the International alphabet by two or three words per minute, but the International code is safer and less liable to error on account of the absence of spaced letters or dot combinations. In the International code there are no such combinations as or a very considerable advantage, especially where the speed is fast.

NEW YORK, WESTERN UNION.

Mrs. J. A. Fleiger, nee Miss Lizzie Tuohy, formerly assistant traffic chief in the city line department, died on May 6, at her residence in this city.

George H. Goodfellow, of the all-night force, died on May 5, at the Kings County Hospital, Brooklyn, N. Y. A delegation from the office attended the funeral.

Martin B. Hills, aged sixty-three years, late of this department and for twenty-five years manager of the 599 Broadway office, died on May 4, at his home in Jersey City.

Frank Bowen, a veteran employe of this department, died on April 17, at his residence in Brooklyn.

Miss Jennie F. Powell has returned to this office from Jacksonville, Fla., where she had been employed during the winter for this company.

Martin Durivan, assistant southern traffic chief, has gone to West End, Long Branch, N. J., where he will fill the position of chief operator during the summer months, as has been his custom for the past twenty years.

F. E. Eastman, night manager of the Portland, Me., office, and his daughter, who is employed at the same point, visited this office recently.

F. O. Nourse, formerly general traffic chief at this office, and now assistant superintendent at Nashville, Tenn., was a recent visitor. Judging from his appearance, southern life is certainly agreeable to him, and the glad welcome he received from a host of friends here, must have afforded him much pleasure.

Philadelphia Magnetic Club Dinner.

The Magnetic Club of Philadelphia will hold its seventh annual dinner, denominated as a "shad dinner," on Saturday, May 23, at Washington Park, on the Delaware River. Guests will be conveyed to this point by a steamer specially chartered for the purpose and which, before landing, will make a two-hour excursion trip up the river. F. H. Lincoln, president of the club, and who is the assistant general-manager of the Philadelphia Rapid Transit Company, is taking

an active part in perfecting the arrangements for this dinner, which promises to eclipse all former affairs of the kind, and a large attendance is assured. The features of entertainment are in the hands of an able committee, of which F. E. Maize is chairman. Among the guests will be Mayor Reyburn, of Philadelphia; Director of Public Safety Clay and Assistant Director Sheehan. Speeches will be made by Mr. Lincoln, S. S. Garwood, J. Meyer, J. F. McLaughlin, chief of the electrical bureau of Philadelphia; C. B. Wood, secretary of the club, and others.

OTHER NEW YORK NEWS.

The New York Telegraphers' Aid Society makes the following statement for the year ended March 6, 1908:

Balance on hand March 6, 1907.....	\$20,462.86	
Receipts	7,453.47	
		\$27,916.33
Disbursements.		
Sick benefits	\$4,351.11	
Death benefits	1,700.00	
Expenses	716.66	
		6,767.77
Balance on hand March 6, 1908.....	21,148.56	
		\$27,916.33
Summary.		
Receipts	\$7,453.47	
Dis-bursements	6,767.77	
		\$685.70
Gain for year		
Relief Fund.		
Balance on hand March 6, 1907.....	\$4,213.00	
Receipts	270.32	
		\$4,483.32
Disbursements	\$413.60	
Balance on hand March, 1908.....	4,069.72	
		\$4,483.32
Balances.		
Aid Society..	\$21,148.56	On deposit ..
Relief Fund..	4,069.72	Cash on hand
		203.36
	\$25,218.28	\$25,218.28

J. H. Driscoll, W. T. Rogers, F. J. Nurnberg, Auditors.

The Hult Telegraph Key

Attaches to the frame of the typewriter and is a part of its keyboard. It reduces breaking to a mere motion of a finger instead of the old tiresome reach back of the machine to the wire. Easier to break on than pressing a typewriter key. Splendid exercise for paralysis. Improves appearance of typewriter. This is something you NEED. Order one and give it a trial. We guarantee full satisfaction or prompt refund of money. Price, \$2; postage prepaid. Testimonials FREE. High-grade repair and experimental work. Prices reasonable. Sending machine parts and repairing. Write us. Sending machine Jacks, 50 cents.

JOHN A. HULIT & CO.

418 Kansas Avenue

TOPEKA, KAN.

The Philadelphia Electrical Aid Society Has a Gala Night.

The Electrical Aid Society of Philadelphia held its eighth annual entertainment, banquet and dance in Mercantile Hall, that city, on the evening of April 29. It was a brilliant affair, between five hundred and six hundred guests being present, and A. S. Weir, president of the association, was enthusiastic over its success. An interesting programme of eight numbers was rendered prior to the serving of the banquet. Dancing followed and was long continued.

The American Union Telegraph Company has filed articles of incorporation at Augusta, Me., with a capital of \$10,000,000. L. A. Ingalls is named as president; E. J. Pike, treasurer, and C. L. Andrews, clerk, all of Augusta.

Operators will find a fund of practical information in every issue of TELEGRAPH AGE.

Wanted.—Information as to whereabouts of Operator E. J. Hamilton. Address "S," care TELEGRAPH AGE, New York.

Shelter is one of the three prime necessities of life. In the acquirement of a home under the most attractive of conditions, telegraphers may confidently consult the Serial Building Loan and Savings Institution, 195 Broadway, New York. What it has done for thousands in the way of procuring homes, it can do equally well for you. Its facilities are at your service.

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 Wheatstone Bridge, F. W. Jones Nov. 16, 1906
 Wright Keyboard Transmitter and Printer, R. Hitchcock, Apl. 1, 1906

Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Montreal, Que., June 24, 25, 26 and 27, 1908.
 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 Detroit, Mich. Time to be chosen later.
 Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.
 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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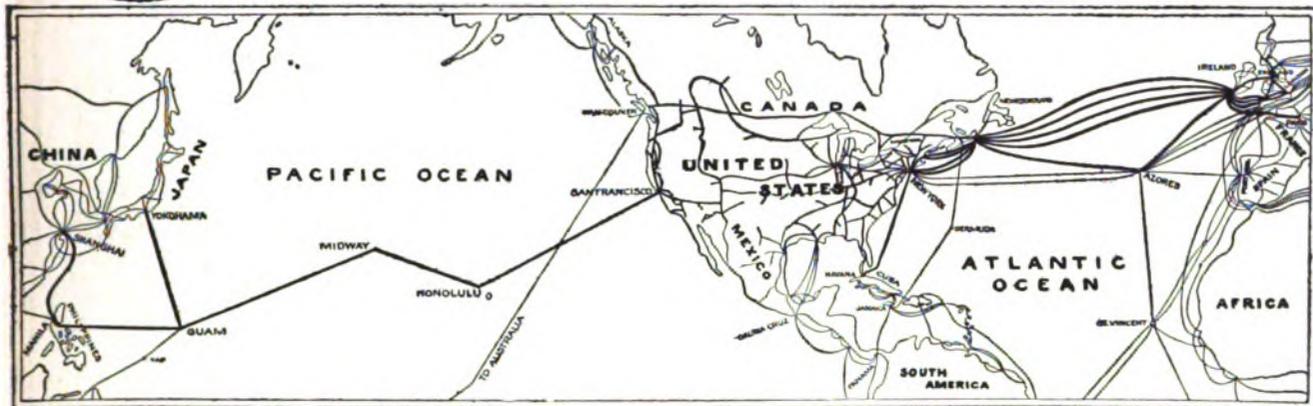
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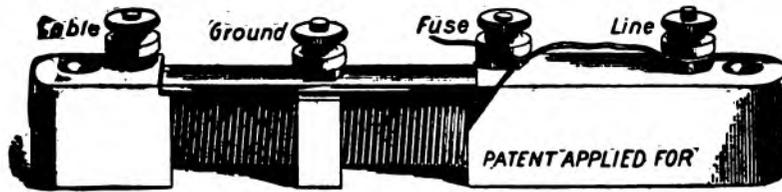
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