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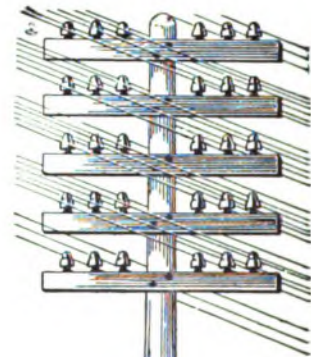
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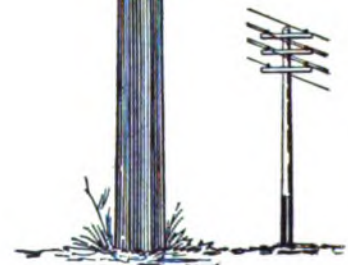
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No. 23.

NEW YORK, DECEMBER 1, 1909.

Twenty-Sixth Year.

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

The Art of Good Sending and Receiving.

No doubt the great majority of operators attribute the defects of poor senders generally to the possession on the part of the latter of improper physical qualifications. In one sense this is certainly true, but the explanation is, in the writer's opinion, hardly acceptable when taken literally.

The most common excuse given for poor sending is probably the lack of a nimble or flexible wrist, yet how often do we see this claim conclusively disproved by the very beautiful and rapid copy the poor sender turns out.

If we listen to a number of senders, one of the noticeable facts disclosed is that no two send exactly alike, each has a characteristic style of his own, no matter how nearly perfect the letters are formed, and the identity of each operator may be easily recognized by a listener if he has worked with him long enough to be familiar with his "Morse."

Another well recognized fact is that after an operator has once acquired a certain style and speed they stick to him through life. It is very seldom we ever hear of a poor sender becoming a good sender, and barring sickness and accidents, of a good sender becoming a poor one,

hence the old saying, "Once a good sender, always a good sender," is based on actual observations.

Now, the conclusion the writer draws from these facts is that good or bad sending is the result of a "habit," and that habits are a property of the mind or characteristic of the will, and controlled thereby. Hence when the mind becomes fixed in its conception of the phonetic sound of a Morse letter the muscles of the arm and wrist simply carry out the idea as to speed and formation, as a habit acquired while learning, and the result is good or bad, according to the manner in which the mind conceived. The subtleness of the muscles themselves probably has very little to do with it.

If this premise is correct then the true excuse for the poor sender is that his brain was not first impressed with the cadence of properly formed Morse characters and the lesson to be learned therefrom is that beginners should invariably listen to and copy from no one who is not himself a good sender, at least not until the sound of perfect Morse characters has become permanently fixed in his mind, for as one thinks so will he send. This fact is forcibly illustrated in the almost universal style of the railroad operator whose sending has a characteristic swing and who has a habit of running words together, owing to the fact that in train orders the receiver usually knows, with the exception of a few figures or words just what is coming. Messenger boys, who usually learn to receive by listening to such senders, naturally fall in line and acquire the same habit.

No doubt the foundation for many a poor sender was laid when in beginning he selected a chum, and without proper instructions the two took turns in sending and copying the other at home. In such cases it is obviously a case of the blind leading the blind at the critical period of one's career, with such disastrous results that the faults can seldom be remedied.

Fortunately this fact has at last been recognized by the officials of the telegraph companies with the result that competent teachers are now detailed to give young aspirants a proper start.

RECEIVING.

In like manner the art of receiving obviously depends more upon the state of the mind than the condition of muscles.

The usual excuse a poor receiver gives is that he cannot keep up with the speed of the sender, yet it is a noticeable fact that in a great many cases such receivers are really very rapid pen-

men. In fact, some of them after hearing the first two or three letters in a familiar long word can and actually do write out the complete word before the sender has finished transmitting it. At the same time if the sender starts the next word before the receiver has finished writing the previous word the latter becomes hopelessly confused. In other words he is really able to "copy ahead" but not behind.

This fact suggests that the mind is lacking in single purposeness. In its dual capacity of action between the emotions of fear of breaking and the reception of incoming signals attention becomes divided.

It is evident, therefore, that the factor of self-consciousness must be eliminated from the case before one may even hope to become proficient. The way to do this is to cut in on some press or other busy circuit and practice copying a few words behind the sender.

At first this will seem somewhat difficult to do but with the fear of breaking eliminated one soon acquires the faculty of memorizing whole sentences and even groups of figures without any difficulty. The advantage derived from being able to copy a few words behind is that the receiver is not only able to correct mistakes without breaking, but he gains every second of time the sender loses when he stumbles, hesitates, or stops for any cause whatever, and in this manner is often able to catch up where otherwise he would sooner or later have been compelled to break. This faculty can readily be cultivated, but unfortunately is one of the essential factors in the education of an operator that is too frequently overlooked. It is a side study by itself and demands separate attention. But the knowledge is well worth acquiring.

Recent Telegraph and Telephone Patents.

A patent, No. 938,541, for a telephone exchange system, has been secured by C. L. Zahm, of Los Angeles, Cal.

A patent, No. 938,830, for electrical apparatus for transmitting and receiving signals, has been taken out by A. T. Dawson and G. T. Buckham, of London, Eng. For use on shipboard for transmitting from the conning tower the range and signals for gun crews.

A patent, No. 938,992, for a telephone transmitter, has been granted to C. E. Egner, of Stockholm, and J. G. Holstrom, of Saltsjo-Storangen, Sweden.

A patent, No. 939,338, for the electrical transmission of graphic messages, has been issued to G. Sellers, of Chicago, Ill. Improvement in selenium cell apparatus. Makes use of a light chamber, a slotted aperture in the chamber, a source of light, a series of revolving cells located above the aperture, a motor and means for moving a message strip below the aperture and above the source of light.

A patent, No. 939,339, for the electric transmission of messages, has been granted to G. Sellers, of Chicago, Ill. Makes use of transparent cylinder of glass rotated by a motor, the message being wrapped around the motor and a pencil of light passing through the message. This strikes an electrical conductor within the cylinder whose resistance varies according to the amount of light received. The conductor forms part of the local circuit which operates an electric motor for moving the cylinder with its message sheet.

A patent, No. 939,383, for an electric transmitter, has been taken out by B. F. Bellows, of Cleveland, O. A semi-automatic transmitter for making a succession of short impulses by a single movement of the key. Uses a vibrator carrying a weight, which continues its vibration when started.

A patent, No. 939,401, for a telegraph system, has been secured by T. B. Dixon, of New York. Multiplex telegraph for transmitting a plurality of distinct and separate messages over a single wire. Transmits one message by a weak current, two other messages by stronger impulses in pairs, the one message being transmitted by positive impulses and the other by negative.

A patent, No. 939,409, for an electromagnet relay, has been granted to D. U. Garretson, of New York, and Marcus O. Anthony, of Englewood, N. J. For telegraphs. Uses an elastically mounted contact connected to an armature, a stationary contact and an electromagnet so located that the armature may approach the magnet pole pieces without touching them.

A patent, No. 939,439, for a telephone attachment, has been issued to H. R. Palmer, of Seattle, Wash.

A patent, No. 939,507, for a telegraph sending machine, has been awarded to J. A. Hulit, of Topeka, Kan. An automatic telegraph sender driven by a motor which runs only during the transmission of a signal and operates a mechanism making dots, with which a mechanism is associated for making dashes, the spaces being always the same.

A patent, No. 939,683, for a telegraph transmitter, has been taken out by G. M. Goddard, of Rutland, Vt. Includes a keyboard which controls cams which control a telegraph key lever, the cams being provided with character faces and being connectable with the shaft by a clutch.

A patent, No. 939,756, for a telephone system, has been secured by F. E. Summers, of Scotland County, Mo.

A patent, No. 940,555, for a suspension device for telephone and telegraph cables and other electrical conductors, has been awarded to E. C. Read, of Franklin, Pa. A strap formed of two clips with ends detachably secured together.

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Change in Western Union Control.

The American Telephone and Telegraph Company has become the dominant interest in the Western Union Telegraph Company through the purchase of the Gould estate holdings of Western Union and some smaller blocks of the stock. Announcement to this effect was made in Boston November 16 by President Theodore N. Vail, of the telephone and telegraph company, following a meeting of the directors of the company in that city. The statement reads as follows:

The American Telephone and Telegraph Company has obtained the control of a substantial minority interest in the shares of the Western Union Telegraph Company.

From the very commencement of the telephone business it has been thought that a close co-operation—the making of one business the auxiliary to the other business—would give additional public service, as well as result in large economies both to the public and to the companies.

There is much to be gained by the joint construction and maintenance of plant, and by its common use to the greatest possible extent, but the greatest advantage would follow the placing of the millions of telephone subscribers in close and reliable connection with the receiving and despatching offices of the telegraph companies. While some provision for this after a manner exists to-day, a lack of harmony and co-operation between the companies and an inability to agree on methods of fixing responsibility has limited its utilization to cases of absolute necessity. The harmony and co-operation necessary, it is believed, can now be established, and the resulting advantages made available for the public.

Telegraph companies and telephone companies in public business have their own distinctive, well-defined fields.

The telegraph service is analogous to the mail service in that it is the collection, transmission or transportation and delivery of correspondence, the difference being that the mails transport the actual communication, while the telegraph transmits the contents of the communication from office of origin to office of destination. From the collection to the delivery of the correspondence the entire work is done by the staff of the telegraph company.

The telephone, on the other hand, enables parties too distant from each other for ordinary conversation to engage in personal communication with each other by placing at their disposition for a time a telephone circuit.

While there is a common feature in the use of wires strung on poles or in cables, the similarity ends there; the circuits and methods used for the telegraph and the telephone are entirely distinct and different, and each business requires its special equipment, operating force, and general business organization.

It seems not only to be good policy but a duty to increase the service and advantages to the public by utilizing present unutilized possibilities, and at the same time benefit property and increase revenue.

The Western Union Telegraph Company has in round numbers \$100,000,000 stock outstanding, and of this twenty-eight per cent., or about \$28,000,000, is said to have been acquired by the American Telephone and Telegraph Company. The Gould and Sage estate holdings were the only large concentrated holdings of Western Union and the stock which has changed hands in this deal, while only a minority, is sufficient under the circumstances to give the telephone

company the dominating voice in the management of the Western Union.

George J. Gould made a statement confirming the sale of his holdings of Western Union. He refused to say whether or not he and the other members of the Gould family will retire from the board of directors of the Western Union, but this was regarded in some quarters as the logical sequel to the sale of the stock. Mr. Gould's statement was:

"It is a fact that we have sold a large part of our holdings in the Western Union Telegraph Company to the telephone company. I believe this will inure to the benefit of both the public and the Western Union stockholders, as the business of both companies can be handled so that they form a complement to one another, thus giving to the fullest extent prompt and satisfactory service to their patrons. They should be worked in harmony, which will be to the great advantage of the public as well as the mutual interest of both companies."

The deal is regarded in some quarters as marking a long stride toward complete control by one corporation of all wire communication in the United States, and the possible extension of the telephone service to the far corners of the land without duplication or extra construction.

That the Postal Telegraph-Cable Company, however, is in any way involved in the transaction was denied by President Clarence H. Mackay of that company in an official statement which he issued November 20, as follows:

We have had nothing to do, either directly or indirectly, with the combination of the American Telephone and Telegraph Company with the Western Union Telegraph Company. We have not wished to join it, and have not been invited to join it. There have been no negotiations whatsoever with us in regard to the matter, and there is every reason why we should not have had anything to do with it. We knew nothing about it until the day when it was publicly announced. It is true that we own a large block of stock of the American Telephone and Telegraph Company, but that is one of our many investments. We never have had and have not now any representation on the board of that company, and our stock is not consulted or considered any more than the stock of any other stockholder, as you will see from the fact that we knew nothing about this deal until it was publicly announced.

The statement that William H. Baker represents us is incorrect. He does not represent us in anything in the slightest degree. Neither have we had anything to do with purchases of telephone companies in the Middle West. Our company is slow and conservative in its investments, but swift and aggressive in its service. We are not disturbed in any way. We have successfully met hard competition for over twenty-five years, and have prospered, and are in first-class financial condition, better than ever before. We have waited until this matter had simmered down so that we could make one statement covering the whole subject. As I stated several weeks ago, competition will continue, and it will be real competition, the same as heretofore.

In reply to repeated rumors that a general change in the official staff of the Western Union was contemplated, President Vail, of the American Telephone and Telegraph Company, on No-

ember 20, made an official announcement that there will be no change in the officers of the Western Union Telegraph Company because of the transfer of control to the telephone concern. This announcement had a very reassuring effect in telegraph circles.

The leading officers of the American Telephone and Telegraph Company regard the step as one of economy. They point out that ever since the telephone was invented it has had to compete with the telegraph. Lines have been paralleled and there has been an immense amount of duplication of plant. The officers of the telephone company believe that the combination of allied interests will save the Bell Company \$75,000,000 in new construction, while it will also enable the utilization at the same time of wires for both telegraphing and telephoning to a greater extent than at present.

It is planned to have the telegraph office of suburban towns in the same building with the telephone exchange. By this means the telephone subscribers will merely have to telephone to their central offices for transmission of their telegrams. Thus the telephone company will own the terminals at both the sending and receiving ends in the transmission of a telegram, and will use the telephone at each end as a means of delivery, dispensing as far as possible, with the present cumbersome, expensive and inefficient messenger service.

No official estimate of the extent of the savings to be effected in operation has been given out, but it is said that the estimates which figured in the negotiations indicated a very considerable reduction in expenses of the two companies. That this saving would result eventually in a reduction in telegraph tolls was unofficially suggested as one of the likely results of the combining of the two companies' interests, but no immediate change in rates is understood to be in contemplation.

The passing of the control of the Western Union from the Gould family, in whose hands it had rested for a generation, to the American Telephone and Telegraph Company, is the outcome of plans which were first broached several years ago. Negotiations undertaken at that time were dropped and twice taken up again, this last time leading to the closing of the deal between the Telephone Company and the Goulds. The latter are said to have received 85 for their stock, making the money consideration paid about \$20,000,000. The same price is said to have been paid for the other \$3,000,000 of stock bought by the Telephone Company, the latter being stock held by the Sage and Morosini estates. George J. Gould said that the sale would leave him more time to devote to his railroad investments, in which he has a greater personal interest.

The passing of the dominant interest in the Western Union to the American Telephone and Telegraph Company follows closely the deal put

through two months ago between these two companies by which the Western Union's holdings of New York Telephone Company stock, amounting to \$16,000,000, were acquired by the telephone company.

The Western Union Telegraph Company at present is paying dividends at the rate of three per cent. a year. For a series of years prior to 1908 it paid one and one-quarter per cent. quarterly, and this same rate was paid in January and April, 1908, but in stock instead of in cash. Then cash dividends were resumed at the rate of two per cent., and this year they were raised to three per cent. The company's receipts shown in its last annual report amount to \$30,541,000, and its profits to \$7,347,107. It operates 211,000 miles of poles and 1,382,500 miles of wire. It maintains more than 24,000 offices.

The history of the Western Union dates back to 1857, but the Bell Company is of comparatively recent origin. Both companies pursued the usual method of absorbing smaller companies. The actual figures issued in Boston are as follows:

	Telephone System.	Western Union.	Total.
Total assets. . . .	\$680,044,200	\$162,316,864	\$842,361,064
Capital stock	311,837,300	99,817,100	411,654,400
Bonded debt	238,680,500	38,645,000	277,325,500
Property account. . .	545,045,600	124,086,920	669,132,520
Gross earnings. . . .	143,016,400	30,541,072	170,557,472
Net earnings	45,974,000	7,347,107	53,321,107
Miles of wire. . . .	8,098,679	1,382,509	9,481,188

The telephone system annually transmits 5,956,800,000 messages, the Western Union 68,053,000.

The smaller companies acquired by the Western Union have lost their identity. Some of the associated corporations engaged in the telephone business, the majority of whose stock rests in the treasury of the parent concern, are: New York Telephone Company, \$50,000,000; New England Telephone and Telegraph Company, \$31,700,000; Bell Telephone of Pennsylvania, \$31,150,000; New York and New Jersey Telephone Company, \$25,400,000; Southern Bell Telephone Company, \$21,400,000; Cumberland Telephone and Telegraph Company, \$18,000,000; Chicago Telephone Company, \$17,500,000; Western Telephone and Telegraph Company, \$16,000,000, and Bell Telephone Company of Canada, \$12,500,000.

The contracts between the American Bell Telephone Company and the Western Union Company, dated November 10, 1879, provided for the mutual exchange of business and co-operation, the Bell Company to do collecting and delivering, as far as possible, over its lines, but until the present move corporation and stockholding distinctions have prevented any measurable degree of co-operation.

For more than twenty-five years there has been litigation between the telephone company and the Western Union. The Western Union, under its agreement with the Bell Company, refrained from engaging in the telephone business, in con-

sideration of receiving from the telephone company, for seventeen years, royalties of twenty per cent. on all telephones licensed by the Bell Company.

Claiming that the telephone company was not living up to its agreement, the Western Union brought suit, placing its damages at \$10,000,000. The telephone company disclaimed liability, and August 23 last Everett W. Burdett, acting as master in the case, returned a judgment for the Western Union for about \$4,500,000. This matter may be carried to a higher court, possibly to the Supreme Court of the United States for final adjudication unless this combining of interests causes a settlement to be effected.

The Atlantic and Pacific Telephone and Telegraph Company on November 29 filed a certificate with the secretary of State of New Jersey to the effect that its entire capital stock of \$250,000 had been fully paid in. This company, which was recently chartered, is a subsidiary of the American Telephone and Telegraph Company, and its formation is looked upon by many as the first step taken in providing for the telegraph interests.

The next step to be taken in adjusting the affairs of the two companies to each other will be the retirement of directors of the Western Union Telegraph Company who have represented certain interests, and the election of others in their place who will represent the telephone company. This change will probably be effected at the quarterly meeting of the board of directors of the Western Union which will occur Wednesday, December 8.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Mr. T. W. Goulding, European general manager of the company, who has been spending the past three months in this country, has returned to New York after a trip to Seattle, Vancouver and other Western points and expects soon to return to London.

Mr. J. J. Welch, one of the chief operators of the Chicago office, accompanied by his wife, was a recent New York visitor.

Mr. M. W. Hamblin, city superintendent, is still confined to his home, suffering from a complication of troubles. His condition is quite serious.

Work in the executive office is despatched with the same degree of smoothness as was noticed before the American Telephone and Telegraph Company acquired a controlling interest in the company. The assurances of Theodore N. Vail that no one would be disturbed had a salutary effect, no doubt, and did much to allay the fears entertained by some that there would be sweeping changes in the executive management as a result of telephone domination.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Among the recent executive office visitors were, H. D. Reynolds, superintendent at Buffalo; C. E.

Bagley, superintendent at Philadelphia; A. L. Edgcomb, superintendent at Boston; Henry Scrivens, superintendent at Pittsburg; J. P. Edwards, division electrical engineer at Atlanta; J. F. Looney, division electrical engineer at Chicago; F. G. Wyman, manager at Binghamton, N. Y.; F. B. Travis, manager at Washington, D. C.; C. A. Richardson, manager, and P. J. Farrell, chief operator at Boston.

Mr. W. D. Francis, superintendent of supplies, has gone to California on business connected with the service.

A pneumatic tube system is being constructed between the main office at 253 Broadway and the branch office in the Hudson Terminal Building.

A repeater table is being installed in the operating room of the main office. The new table is built of angle iron with sheet iron panels, the only wood used in its construction being for the top.

New sending and receiving blanks of novel and attractive design are being distributed by the company. The heading is printed in white letters upon a blue background.

RESIGNATIONS AND APPOINTMENTS.

Mr. J. W. Robinson has been appointed manager of the Saginaw, Michigan, office vice Mr. C. E. Gage resigned, on account of poor health, after eighteen years' service in that office.

The Cable.

Cable communication is interrupted November 29 with:
Macao October 22, 1909.

Mr. Harry Duffield, of the New York office of the Commercial Cable Company, has been transferred to the cable station at Canso, N. S. R. K. Barnikel has been transferred from Rockport, Mass., to the New York office.

Mr. Robert Bain, who has for some time has been stationed at the Pacific Cable Board's station at Fanning Island, spent a few days in New York recently, on his way from London to Sydney, New South Wales, where he will assume the superintendency of the Pacific Cable on March 1 next.

Following the severe storm which swept through the West Indies on November 7, cable communication with various points was interrupted and Porto Rico was entirely cut off from communication by cable until November 24. The cable of the direct West India Cable Company, from Bermuda to Jamaica, is still interrupted at this date, and the Central and South American Telegraph Company's cable steamer "Relay" is employed in making the needed repairs. The breaks are believed to have been caused by volcanic disturbances on the sea floor following the hurricane.

In a recent report of the Western Telegraph Company it was stated that a satisfactory arrangement with the Argentine Government had

been concluded, under which a new and direct cable would be laid by the company from Buenos Ayres to the Island of Ascension, where it would join the existing main line route to Europe. The cable was now being manufactured, and they hoped it would be laid and in working order during the next year. Their main line cables to Brazil have been laid for a considerable number of years, and in view of the age of these cables the directors thought it right to propose to the Brazilian Government to also strengthen the means of telegraph communication by laying a direct line from Ascension Island to Rio de Janeiro. These negotiations were in progress, but were not yet concluded. It was evident that the offer which they had made was one which must be of the greatest advantage to Brazil, by putting the capital city of that great country in the same position as would be shortly secured to Buenos Ayres, the capital of Argentina.

Field's New Quadruplex System.

Mr. Stephen D. Field's new quadruplex arrangement, which has recently been put into practical operation over the Western Union Company's Havana-Key West cable, includes a combination of the differential and the bridge principles, the polar relay (specially designed and wound to a high resistance) being placed in the bridge, while the neutral relay (which is operated by the "short" instead of the "long" end of the battery) is disposed differentially in the usual way.

The neutral relay is provided with two extra or auxiliary electro-magnets, one of which is adapted to hold the relay armature steady during current reversals, and the other to accelerate the armature movements at certain critical periods in the working of the circuit; the extra currents of self-induction in the receiving apparatus being effectually neutralized through an arrangement rendered possible by the bridge and differential combination referred to.

The transmitting appliances are equipped with impedance devices, calculated to eliminate the sparking at the contact points, and to develop signaling currents having the desirable characteristics of a sine curve.

The successful application of these principles to the operation of the Cuba cable, has considerably increased its working facilities by providing local circuits between Havana, Key West, Miami and Jacksonville.

Fifty Years in the Cable Service.

Mr. W. E. Earle, manager of the Western Union Telegraph Company at North Sydney, N. S., celebrated recently the fiftieth anniversary of his entry into the telegraph service. Mr. Earle was born in St. Johns, N. F., in 1847, and in 1858 he began his career in telegraphy, entering the employ of the New York, Newfoundland and London Telegraph Company at St. John's,

contemporary with the laying of the first Atlantic cable in that year, and was present at a celebration of that event held at St. Johns. He entered the service permanently on October 27, 1859. He was at Heart's Content, N. F., and acted as secretary for Cyrus W. Field on board the *Great Eastern*. In 1866 he was appointed manager at Grandy's Brook, N. F., repeating station and promoted to manager at the Placentia, N. F., station in 1868. He was promoted to be assistant manager of the main cable station at Port Hastings, N. S., in 1869. In August, 1875, the Western Union Telegraph Company assumed control of lines and staff in Cape Breton and moved their headquarters from Port Hastings, N. S., to North Sydney, W. F. Snyder being manager with Mr. Earle as assistant manager. On the death of Manager Snyder in 1899, Mr. Earle was appointed his successor. On the occasion of his fiftieth anniversary several of Mr. Earle's Montreal friends—former operators under him—sent congratulations and a gift. Mr. Earle's "boys," as he calls them, are scattered all over the continent.

Municipal Electricians.

Among the cities considering the installation of electric fire-alarm systems, according to the *Municipal Journal and Engineer*, are La Porte City, Ia.; Danville, Ind.; Fort Wayne, Ind.; San Rafael, Cal.; Blackwell, Okla., and Karnloops, B. C.

A fireproof and earthquake-proof building for the headquarters of the fire-alarm and police telegraph system of Oakland, Cal., will be constructed at a cost of \$30,000.

The municipal authorities of Troy, N. Y., are considering plans for a complete rearrangement of the fire-alarm system at a cost of \$35,000 to \$40,000.

Personal.

Dr. Gisbert Kapp, one of the most prominent electrical engineers of Great Britain, was recently elected president of the Institution of Electrical Engineers.

Mr. Denver Y. Lawton, son of "Old Farmer" Lawton, night manager of the Western Union Telegraph Company at Denver, Col., and Miss Kitty Maehlen, of that city, were married November 11. Mr. Lawton is assistant teller in the First National Bank of Denver.

Mr. J. Linter, electrical engineer of the general administration of Posts and Telegraphs, St. Petersburg, spent a few days in New York recently, after selecting the sites for the wireless stations which the Telefunken Company is to furnish for the Russian Government at Petro-pavlovskii and Nikolaievsk. He returned to St. Petersburg via London, November 24.

Mr. Frank B. Knight, of Dallas, Tex., was one of the charter members of the Society of the United States Military Telegraph Corps. In the printed report of the proceedings of the Pittsburgh reunion Mr. Knight's name was inadver-

tently omitted from the list which mentioned Cass G. Sholes, H. P. Darlington, S. L. Robinson and A. W. Nohe as the only charter members now living.

Mr. Herbert S. Balliet, who was recently elected president of the Railway Signal Association, began his railroad career as a telegraph operator twenty-six years ago upon the Berks and Lehigh Railway, now a part of the Philadelphia and Reading. He is now signal engineer of the electric zone of the New York Central Railroad and is regarded as one of the ablest men in the signal service.

Mr. W. H. Sawyer, of Providence, R. I., has gone to Pasadena, Cal., to spend the winter, as is his usual custom. Mr. Sawyer is well known among the old-time telegraphers, having been connected with the service from 1861 until 1878, when he united with Mr. Eugene Phillips in forming the American Electrical Works at Providence. He filled the position of superintendent of this concern until his retirement from active business in 1900.

Meeting of the Technical Publicity Association.

At a meeting of the Technical Publicity Association held in New York, November 11, the question of the merits of special issues of technical and trade papers came up for discussion. Mr. James H. McGraw, president of the McGraw Publishing Company, declared that he believes in the special issue to a certain extent, but it must have three features to make it of extra value to the advertiser. "In the first place," said Mr. McGraw, "it must have a legitimate reason for its publication. The editorial matter must be distinctive, and the extra circulation promised must be honestly given.

"When these three are present," said the speaker, "it is unquestionably a good advertising medium."

Mr. McGraw declared that he always put the subscriber first and that the advertiser should put him first. He gave a concrete example of a very well known special, or, as he said, "souvenir" edition of a technical trade journal. The situation in this particular field has shown so many changes in the past half-dozen years that there are comparatively few books on the subject. A book if presented with such an end in view," he said, "would become obsolete by the time a demand had been created for it, because of the many changes in the field. The special issues of the trade journal printed each year on the occasion of an annual convention, according to Mr. McGraw, supplied the place of an engineering textbook, dictionary and encyclopedia for that special field. A number of special issues of this sort, if preserved, will have the merit of a series of volumes on special subjects.

That there was a demand on the part of his subscribers for a special issue was Mr. McGraw's strongest point. He declared that inquiries concerning the special issue to which he referred

had been sent out to the subscribers and that over ninety out of every one hundred replies received were favorable to the special or souvenir edition. The issue, he said, should be planned along some central idea. There should be some legitimate reason for its publication, in which case it is not looked upon merely as an excuse for soliciting advertising. This sort of issue, stated Mr. McGraw, is not as profitable as some may think, because of the changed conditions of publication.

Mr. H. M. Post, who is chairman of the publication committee of the association, reported that there was a rapidly increasing recognition of the Technical Publicity Association as a factor in the technical advertising field.

General Mention.

Mr. J. Hartman Oswald, for the past few years identified with the service of the Western Union Telegraph Company at Memphis, Tenn., has accepted a position with the American Telephone and Telegraph Company at Birmingham, Ala.

The telegraphic receipts of Switzerland during 1907 were 12,988,888 francs, and the expenses 12,467,453 francs, leaving a profit of 521,435 francs. The number of messages handled was 4,917,018, as against 4,918,679 in 1906. There were 2,318,960 international telegrams, while 1,008,080 passed in transit. The system consisted of 5,803 kilometers of line and 23,327 of wire, of which 2,483 kilometers are underground.

The Bolivian telegraphic system in 1907-8 consisted of 5,107 kilometers of line and 6,087 of wire. There were 120 offices, and 590,143 telegrams were handled. The receipts of the government system amounted to 365,373 francs and the expenses to 789,638 francs. The value of telegraphic business done by all enterprises, government and private, was 804,237 francs.

Mr. E. A. Patterson, manager of the Western Union Telegraph Company at Saginaw, Mich., says: "I consider your magazine one of the best I am a subscriber to, and derive a great deal of valuable information from it."

Mr. J. McMillan, superintendent of the Canadian Pacific Railway Company's Telegraph at Calgary, Alberta, in renewing his subscription, says: "I wish you every success. Telegraph Age is the best telegraph journal published to-day."

Mr. S. E. Barton, of Boston, a well-known old-time and military telegrapher in renewing his subscription to Telegraph Age recently, says: "Although it is about thirty-five years since I left the telegraph business, I still retain my old-time interest in it, and there is no reading matter which comes to me which I enjoy more than I do Telegraph Age on account of the very able way in which it is published and the old associations which it keeps fresh in my mind and which are very dear to me."

Magnetic Club Fall Dinner.

The annual fall dinner of the Magnetic Club, which occurred at the St. Denis Hotel, New York, Wednesday evening, November 17, was one of the most enjoyable and largely attended of any of the dinners ever held by this organization in the twenty-one years of its existence. The officers of the club and the committee of arrangements of which Mr. Theodore L. Cuyler, Jr., was chairman, are to be congratulated upon the complete success of the affair. The pleasure of the occasion was added to by the presence as guests of the club of several of the officers of the Signal Corps of the New York State National Guard and the Department of the East of the United States Army, who explained the operation and utility of their branch of the army and its relation to the telegraph service. The out-of-town delegates who attended the annual meeting of the Telegraphers' Mutual Benefit Association, which occurred in the afternoon, were also guests of the occasion and made good use of their opportunity to greet many of their old friends in the service. The value of these occasional gatherings of those engaged in the telegraphic industry, and their friends connected with closely allied interests in promoting a spirit of true brotherhood cannot be overestimated. All business cares are laid aside for an evening, and all of those present, regardless of how they may regard each other in the commercial world, mingle in a spirit of true comradeship and enjoy to the fullest extent the companionship of those around them.

After a most appetizing repast had been partaken of by the two hundred members and guests present coffee had been served and cigars lighted. President Charles P. Bruch called the assemblage to order and made the following remarks before introducing the first speaker of the evening:

"Gentlemen, Guests and Members of the Magnetic Club:

"As you can see by the string of bunting overhead, you are heartily welcome. I wish to say to our guests, the officers of the Signal Corps and the delegates to the T. M. B. A., on behalf of the members of the club, that we are honored by your presence here this evening, and it gives us great pleasure to extend to you the hospitalities of the club.

"The Magnetic Club was organized twenty-one years ago for the purpose of promoting friendship and better acquaintance among the members of the electrical fraternity. Owen Meredith said: 'The man who seeks one thing in life, and but one, is sure to attain it before life is done.' The Magnetic Club has attained its object, although its life has by no means ended. It is growing old in years, but it is young in spirit. Its members are proud of it, and with reason. If they had nothing else to be proud of, they would be proud of the fact that the club has maintained a harmonious existence for so many years; and we have many other virtues—too many to be enumerated to-night.

"It is characteristic of telegraph men that they are always to the front in every progressive undertaking. In 1861, when a great war proved that the existing army methods of communication were inadequate, it was the practical telegraph men who stepped into the breach and taught the armies of the world how to conduct a telegraph service in the field.

"A number of these men, of the old United States Military Telegraph Corps, are members of this club, and some of them are present to-night. I regret that time does not permit me to call upon them for the interesting and valuable history that they are able to give us.

"Since that time the telegraph at large has advanced. Construction and equipment have been improved and new machinery and new methods adopted.

"The military signal service has kept pace, and has also progressed wonderfully.

"We are here to-night largely for the purpose of making the acquaintance of our fellow-telegraphers—the Signal men of the National Guard and the United States Army—and hearing from them what they are doing to perfect their particular branch of the work.

"Several of them have kindly consented to address us and tell us of their experiences and their methods. We expect that they can teach us a good many things that we have not learned. I am sure that we will listen to them with great interest and pleasure."

Colonel Frederick T. Leigh, chief signal officer of the New York State National Guard, gave a brief history of the Signal Corps, stating that the present Signal Corps of the United States had its organization during the Spanish-American War. At the outbreak of that conflict this branch of the army comprised only eight officers and forty enlisted men. It now has forty-six officers and twelve hundred men. In giving a general outline of the work of the corps Colonel Leigh said that two general methods in transmitting signals are employed, the visual and electric. Visual signals are sent by means of flags, by the heliograph, or at night by means of an acetylene lamp with a high power reflector. Electric signals are transmitted by the telegraph and the buzzer. The manner of using these various devices was then illustrated. The code generally used is one known as the Myer code, which was devised by General Myer, who was chief signal officer during the Civil War and for some years following. This code was adopted to obviate the use of the spaced letters of the Morse alphabet, as these could not be transmitted readily by wig-wagging. The speed which can be attained by this method is four or five words per minute, while with the heliograph and lamp signals a speed of twelve words per minute may be attained. The heliograph signals can ordinarily be seen at a distance of twenty miles, though they have been sent experimentally from a mountain peak in Colorado to one in Utah two hundred miles distant.

The telephone has also been adapted to the use of the signal corps, a portable switchboard mounted on a tripod with a capacity of ten lines being part of their equipment. The wire which they use, although weighing only seventy-five pounds per mile, is very strong, being made up of one strand of copper and ten of steel wire. This wire can be run out from the reels as fast as a horse can gallop, and being well insulated will give satisfactory service when lying on the ground. The buzzer uses a high tension induction coil to send currents over the line and the signals are received in a telephone receiver. With this method signals have been transmitted through a break of forty feet on the single wire when it was lying on the ground. A ground for the buzzer circuit may be readily obtained by driving a nail into a tree.

Colonel Samuel Reber, chief signal officer of the Department of the East, United States Army, told of the quick work of the signal corps in Porto Rico at the time of the Spanish-American War. When the peace protocol was signed there were four armies in the field on that island and within twenty-six minutes after the cable at Ponce began to transmit the news the commanding general had issued his orders to cease hostilities and they had been transmitted to all of the armies. Two of the armies were about to go into action and thus two battles were averted, greatly to the disappointment of the men.

Colonel Nathaniel B. Thurston, chief ordnance officer of the New York State National Guard, then spoke in a humorous vein of the relations and antagonisms of the National Guard and the signal corps. He commended a "horse and buggy" as a very satisfactory means of maintaining communication.

Captain Daniel J. Carr, of the Signal Corps of the United States Army in command of the company stationed at Fort Wood, N. Y., emphasized the importance of the signal service to the other branches of the army, and also its peculiar relation to the telegraph industry. He made a special appeal to those present to do all in their power to assist in the development of the signal corps of the National Guard upon which much dependence must be placed in case of war.

President Belvidere Brooks, of the Telegraphers' Mutual Benefit Association, then made an appeal in behalf of that organization, urging all to help secure new members, not because the association needs them but because every one for his own good or the welfare of those dependent upon him ought to consider it a duty to participate in the benefits to be derived from membership.

After listening to a high class and enjoyable entertainment of song, instrumental music and monologue, the gathering broke up, according to the usual custom, with the singing of Auld Lang Syne.

Among those present were the following:
Atlanta, Ga.—J. P. Edwards.

Albany, N. Y.—Wm. M. Pruyn and C. C. King.
Boston, Mass.—C. A. Richardson, A. L. Edgecomb and P. J. Farrell.

Buffalo, N. Y.—H. D. Reynolds.

Chicago, Ill.—J. F. Looney and J. J. Welch.

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DECEMBER 1 1909.

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.

Holiday Gifts.

Now that the holiday season is at hand thoughts naturally turn to the consideration of Christmas gifts for friends. With most people the selection of a suitable gift is one of the hardest tasks which they have to perform in the entire year. One naturally wishes to give their friends something which they do not have already, something which they will appreciate and which will be of use to them and something which they will be able to keep as a remembrance. Nearly every one appreciates the gift of a good book, and as for usefulness there is nothing which can be given which will be of more lasting value to the recipient. In this connection we call attention to the fact that Telegraph Age is headquarters for books of all kinds. We have in our catalogue a carefully selected list of books, many of which would be most acceptable as holiday gifts to those interested in telegraphic matters, and we will be glad to supply any of these to those of our friends who desire to make a gift which will be appreciated by the one to whom it is given.

The Telegraph and Telephone Combination.

The announcement of the sale of the Gould and other holdings of stock in the Western Union Telegraph Company to the American Telephone and Telegraph Company, thereby transferring what is practically a controlling interest in the telegraph company to the latter concern, was received with some surprise in many circles notwithstanding the often repeated rumors during the past year that such a transaction was likely to be brought about. Since the formal announcement of the transfer of this stock was made there has been much speculation as to what would be the result of the the combination of these interests. Upon another page we are publishing a complete story of the transaction, including all of the developments in the situation up to time of going to press.

Everyone at all conversant with the existing conditions in telegraph and telephone circles can readily appreciate the many advantages which may be derived from such a combination. One of the conditions in the telegraph service which has prevented the company from being able to reduce their rates is the maintaining of thousands of offices in the small towns of the country which do not produce nearly enough revenue to pay for the expense of their maintenance. In most of these towns the telephone company also has an office and could easily handle by telephone all of the telegraph business without any increase in operating force, thus allowing the combined interests a profit on the transaction instead of a loss, as at present. In traveling through the country we often see paralleling pole lines belonging to the two companies, possibly one on one side of the road and the other upon the opposite side. To maintain these separate lines two separate maintenance forces are required, and the construction forces of both companies are often building new lines which parallel existing lines of the other company. This condition of affairs and the great advantages which might accrue to both companies by a community of interests, has been recognized for a long time, but because of the differences between the financial interests controlling the two companies no advantage has been taken of the splendid opportunities for interchange of facilities. It has required a man with the great business foresight and executive ability of Theodore N. Vail to bring about this much to be desired result, and those who are concerned in the welfare of the telegraph may rest assured that Mr. Vail has too keen a realization of the interests at stake to take any steps which will not result in benefits to the two systems.

While the exterior physical plant of the telephone company bears a close resemblance to that of the telegraph, the conditions of operation are so entirely different that it is doubtful whether the two systems could ever be combined directly under one management with perfect success. The telegraph requires an operating force possessing

a high degree of skill both of hand and of head. For operating the telephone system much less skill is needed. In addition to this there are other conditions which seem to make it desirable that the operation of the two companies should be conducted separately. Just how the many problems, which will arise in conducting the two systems to their best mutual advantage and to best serve the public, will be solved cannot of course be predicted. All thinking persons, however, regard the present event as but the logical result of circumstances which have prevailed for many years, and believe that the results will prove beyond any doubt the great advantage of the combination from every standpoint.

Contrary to the general opinion which has prevailed that the Postal Telegraph-Cable Company was involved in the deal, it will be well to note the statement of President Clarence H. Mackay of that company that his system is in no way concerned and that they will continue as a competing company and that competition in the future will be real as heretofore. "Our company is slow and conservative in its investments, but swift and aggressive in its service," adds Mr. Mackay.

The New Rules Concerning Code Words.

As announced previously in our columns, the new rules for counting code words in land line messages go into effect on December 1. The adoption of these rules was a most desirable action for several reasons. Upon the ground of humanity alone the action is justifiable. The mental strain upon the operator under any condition is so great that nervous breakdowns are more common among telegraphers than among any other class of people. When this tension is increased by being required to transmit and receive unusual and unpronounceable conglomerations of letters the effect may be compared to that of driving a fly wheel at a higher rate of speed than that at which it was designed to run. It may go all right for a while, but without any warning and when least expected, it will fly to pieces. So while an operator can stand the strain for a time there is a limit to his strength, and as soon as this limit is exceeded he breaks down and becomes only a wreck of his former self. On the other side the new rules will work a hardship upon some, but only upon those who are well able to bear it. The substantial business houses who are perfectly honest in all of their dealing, will have nothing to fear. The only ones who will be affected by the change will be some of the concerns who have had codes constructed which transgressed the rules now about to be enforced. The object to be gained in the adoption of such codes was the ability to send by telegraph a few more words for every dollar than they could if they adhered to strictly pronounceable words. The Official Vocabulary compiled by the International Telegraph Bureau at Berne, Switzerland,

of which we have a few copies on hand, contains 1,200,000 carefully selected words from eight languages which are pronounceable and which, if used in code messages, will be acceptable to the telegraph companies. With this great number of words to select from there is no reason why codes can not be constructed which will satisfy every legitimate purpose and meet the requirements of the new rules now to be enforced. Most of the standard codes in general use comply with the requirements of the new rules, but those companies having private codes which do not meet the exactions of the rules will now find themselves the victims of their own cupidity and will be compelled to go to the expense of constructing a new code upon legitimate lines.

Legal.

In an action brought by one of the telegraph companies against a Pennsylvania municipality recently to determine the amount of pole license which should be paid by the company, the judge decided that ten cents per pole was a reasonable amount to be charged. This conclusion was arrived at by the court because under the law the amount of the license fee must be limited to the actual cost of inspection and, nominally, fees for such purpose may not be collected for general borough expenses. Under the evidence produced at a hearing the borough failed to prove any actual expenditure of money for inspection, except as may be assumed from several indifferent examinations, and that part of a policeman's salary was to be applied. The town council had previously passed an ordinance requiring the telegraph companies to pay fifty cents per pole. The undisputed testimony of a number of experts at the hearing was to the effect that one inspector could thoroughly examine from eighty to one hundred poles in a day and that fair wages for the work is \$2.75 per day.

New Incorporations.

The Charter Electric Company has been incorporated in Chicago for the purpose of manufacturing apparatus for an automatic telegraph system, using a keyboard transmitter and receiver for sending and receiving messages. The patents for the new invention are held by Mr. George C. Cummings, circuit manager in the telegraph department of the Chicago, Burlington and Quincy Railroad, and Mr. John A. Kick, formerly inspector of telegraphs for the same system. Associated with these two gentlemen are Mr. J. G. Wray, joint inventor with Mr. Cummings, of the Wray-Cummings selector for use upon telephone train despatching circuits, and Mr. T. M. Haston, of Bloomington, Ill., superintendent of telegraph of the Chicago and Alton, and Toledo, St. Louis and Western Railroads. In addition to the automatic telegraph patent the new company owns several other patents, including one for an electric typewriter and the selector patent, mentioned previously.

OLD AND RECENT TOURNAMENTS.

General Information as to Early and Late Speed Trials, with Incidental Comments on the Persons Concerned in Them, and Unnecessarily Complete Reports, Perhaps, as to the Part I Myself Played in Them and in Other Related Events.

BY WALTER P. PHILLIPS.

(Continued from page 196, November 16 issue.)

Mr. Boileau's ability as a receiver was even greater than a sender. He once copied fifty-two words in a minute from the Wheatstone transmitter, and he, Charles Moore and P. V. DeGraw took messages in Philadelphia over the New York duplex, in 1872-3, at a rate that sometimes touched fifty-five words per minute, the sender being George M. Eitemiller, to whose various exploits I shall devote a paragraph later on.

In the late seventies there began to be heard uncertain rumblings about a great sending tournament, but we did not have it until 1881, when the winner of the bout was William J. Curtis, a young man from Fort Scott, Kansas, and a perfect sender. He made a record of 500 words in eleven minutes, fourteen and one-half seconds. After this another tournament was held, which will be referred to in detail later on. In a tournament in 1885, John W. Roloson won the first prize, sending 500 words in ten minutes, thirty-two seconds. William M. Gibson won second prize, occupying ten minutes, fifty-seven seconds; Frank J. Kihm won third prize, sending with slight defects, which counted against him, the 500 words in ten minutes, thirty-seven seconds; William J. Curtis took the fourth prize in twelve minutes, twenty-seven seconds, and the fifth went to a left-handed sender, F. P. G. Griffith, whose time was thirteen minutes, fifteen seconds. Other contestants, named in the order of the time they made were M. J. Doran, J. G. McCloskey, W. L. Waugh, Charles H. Davis, Walter L. Prentice, R. J. Murphy and Robert W. Martin. The sending by these seven men, for whom there were no prizes, was beautiful to listen to. They all knew they didn't have to hurry, that they were never in the race, and they did their work in a most finished manner. Nothing prettier than the sending of "Bob" Martin and Walter Prentice was ever heard. Prentice was originally of the New York Associated Press wire in Washington, and had recently come to New York, and was with the United Press, from which position he soon graduated to become a reporter. His work on the Times made him celebrated, and his reports of the Hardman Hall tournament in 1890 were wonderfully well done and were regarded as the best, although he had for a rival in his work the young man now grown to be known as the highest salaried editor in the world—Arthur Brisbane—who is paid \$75,000 per annum by W. R. Hearst. His editorials

in the Evening Journal are telegraphed, and appear simultaneously as the leading feature in all the Hearst papers every day. At the time of the Hardman Hall tournament of 1890, Mr. Brisbane was the editor of the Evening Sun, and had a corps of men at the tournament, being himself a looker on in Vienna, though he engineered the work of making the report. Another operator, whose sending revived pleasant memories of ten years before, was Mr. Davis, long since recognized as the leading photographer of America. He was remembered, when he used to send things down over the Albany duplex in a way that usually kept the receiving operator tolerably busy, while



JOHN E. WRIGHT.

A Wonderful Operator, an Able Journalist and the Inventor of a Successful Printing Telegraph.

Curtis, the Kansas twin of Kettles of Vermont, charmed all ears, and Waugh, Doran, McCloskey and Murphy were as lively a lot of good old Morse senders as ever gladdened the ears of the men who know good sending when they hear it, and which would have made Henry Denver, one of the judges in a somewhat crude sending affair, twenty years before, break into radiant smiles of satisfaction. If a dozen better senders ever got together under one roof—and Catlin was there, making it a baker's dozen—then I have been shut out on an occasion that would have been more entertaining to me than a session would be with Kubelik and his violin, with Paderewski, caressing the piano, with songs a singing by Patti, Sembrich and Melba, and Bonci, Caruso and Carasa telling me in tuneful

strains the tales from the operas. It was a great day and if we abraded the command to remember the Sabbath day and keep it holy, it was in such a respectful way that I feel sure the recording angel's tear that fell upon the page where Uncle Toby's oath was recorded, and blotted it out forever, fell also on the page and erased aught that was offensive, where he had recorded what was going on in the office of the United Press, at No. 187 Broadway, on that beautiful and holy day.

It was a peculiarity of Burns that he always did much better than he pretended he was going to. When he sent one minute for Mayor Doyle he undoubtedly let out the last link that was in him at that moment. He had a headache, and afterwards Ayres beat his record by four words,

men scorned combinations of each and every kind, and made them under no press of time or circumstances. The former once sent me seventy-eight red messages—some of them mighty long, and ciphers at that—from New Orleans in fifty-eight minutes, and until fire destroyed the New York operating room of the Western Union in 1890, and the office journals were burned, Manager Downer treasured this record of Ayres and mine, together with several others, some of them dating back many years, with the cautiousness of a magpie. The greatest message record of all, I am inclined to think, was when Fred Catlin sent to E. A. Beardslee, of Boston, in 1868, eighty messages in fifty minutes. This test was made as the result of a wager between A. S. Brown, then manager, and A. S. Downer, chief, Mr.

THE WESTERN UNION TELEGRAPH COMPANY.

No. _____	The rules of this Company require that all messages received for transmission shall be written on the message blanks of the Company, under and subject to the conditions printed thereon, which conditions have been agreed to by the sender of the following message. G. H. MUMFORD, Sec. T. T. ECKERT, Gen. Supt., New York. WILLIAM ORTON, Pres.	
<p>To <i>W. P. Phillips</i> <i>Boston April 14th 1874</i></p> <p><i>But the awful fate which hounded the man down in life exhibited a species of bitter spite against him after he was dead.</i></p> <p style="text-align: right;"><i>E. A. Beardslee</i></p>		

FAC-SIMILE OF ONE OF E. A. BEARDSLEE'S COPIES.

though Ayres and Burns were very evenly matched and were the same kind of senders. Their dotted letters, instead of rolling out in the sedate manner in which they do, from the fingers of McClintic, Gibson, Catlin, Boileau and others, were flung out in a compact bunch, and the time occupied in making an s, an h or p was not so very much more than was used in sending the letter e as one might imagine, while their dash and dot letters were remarkably fast, the letters of such a word as amendment being packed together so closely that sunlight couldn't penetrate between them and yet neither of them made combinations. Every letter stood by itself, and Irish did not come cysh, or smuggled smugglx. Both

Brown betting that Catlin could send eighty messages in an hour, Downer to feed him with regular business from the Boston files. One of the messages handed to Catlin was checked ninety paid—that was before the bonus days—but he did not let that worry him at all. He did not break himself once, nor did Beardslee break. He took the messages with a pen, of course, as typewriters were not known in those days. Thirty words has always been figured on as the average length of a full-fledged message. This would give Catlin's rate of speed on the eighty messages, as forty-eight words per minute, or 2,880 words per hour. I present, herewith, one of Mr. Beardslee's copies and they varied but little, no

matter whether the sender were fast or slow. His penmanship was like the man—even, dignified and replete with grace.

Mr. Brown said in a conversation, only a few months before his death, that he considered this feat of Catlin's and Beardslee's as the finest demonstration of perfect telegraphic work, sending and receiving combined, that had ever come under his notice. This was an expert opinion, for Brown not only knew all the great telegraph operators that had flourished since 1850, but he was one of the best himself.

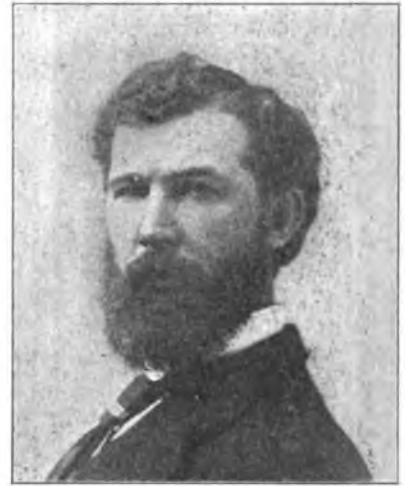
The record of fifty-nine words in a minute which Burns made when he sent for one minute from the Boston Post for the amazement of Mayor Doyle was surpassed, a few years later, by Albert S. Ayres, the genial old timer, who sent five hundred words to Boston in ten minutes, and who captured three or four prizes at the Hardman Hall contest in 1890. About 1870, I was in Boston, one Sunday, and Charlie Cottrell, who

most worthy and valuable book—The Military Telegraph in the Civil War. The difference between Burns and Plum was that the former wore his nerves on the outside of his clothes, as some one expresses it, while Plum was as solid and settled as a church, moderate in speech and physically sound.

When Ayres was found he demurred on going to the telegraph office, which was quite a distance away. He had been sitting up late the night before and was sleepy and stale, so he said. I told him about Burns and of his having condescendingly consented to send for one minute for Mayor Doyle as a particular personal favor to a man he had roasted twenty-four hours before for the better part of one solid hour. That made Ayres laugh, and he pulled himself together and we all went to the telegraph office. Cottrell produced a copy of the Boston Sunday Herald of current date, and, with a yawn, Ayres took the key, with seeming carelessness, and proceeded to send while



ALBERT S. AYRES.

ROBERT W. MARTIN.
[1890]C. H. H. COTTRELL.
[1880]

was working there for the Atlantic and Pacific Telegraph Company, took me to the Stratton House to introduce me to a young man from Omaha named Ayres and better known as "Patsey." Cottrell aroused my spirit of antagonism by saying Ayres could send all around Burns, which I resented, Burns having recently died, and my opinion being that no one but he could send fifty-nine words in a minute. Burns, who was a law student at Harvard, began having hemorrhages before his graduation and died of them. William R. Plum worked out the problem and saved his health. He took the night report at New Haven while he continued and finished his course at the Yale Law School. Mr. Plum distinguished himself as a lawyer, but has now practically retired on his laurels and settled down at Lombard, Illinois. He is the head and front of the United States Military Telegraph Corps, as all my readers know, and he has written a

I held the watch on him. No one tried to copy him, but it was faultless sending. His record for the minute was sixty-three words. Then rising he said, with a smile, "I hope you'll excuse me now. I am tired and sleepy. Glad to have met you, Mr. Phillips—heard of you from Charlie: Good bye, Cot.," and off strolled this very handsome young man—little more than a boy, "the Kid Patsey," as he had been called in the Dayton, Ohio, office a short time before. As it turned out, he was, in later years, one of my most trusted lieutenants, a man who could not only send five hundred words in a hurry, but who was an excellent judge of news, a good writer, and an all-around capable and lovable man. Peace to his ashes!

(To be continued.)

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The Military Telegrapher in the Civil War.

BY RUSSELL B. GRIFFIN, SAWTELLE, CAL.

PART XXXI.

(Concluded from page 788, November 16 issue.)

"Cavalry soldiers who had sore eyes were detailed to deliver telegrams at my office. My eyes became sore, inflamed and painful, so much so that I asked to be relieved. Captain Fuller advised me to go to Cincinnati for treatment, where in the course of a month my eyes were well enough to enable me to go to work. I was offered a position on the Ohio and Mississippi Railroad at better pay than military service, but that was too tame a job for me.

"When I returned to Cairo there was no wire connection with Memphis. Military despatches were carried by messengers on river steamers. I was given a bundle of sealed despatches and took the steamer Welcome for Memphis. She grounded on a sand bar during the night near the Arkansas shore. Colonel Jeff Thompson and his gang of bushwhackers were causing trouble by firing on passing boats from the densely wooded banks. In the morning we got a dose of scattered shots from this gang.

"The steamer City of Memphis came in sight. I asked the captain of the Welcome to man a skiff and put me on board, showing him that I was the bearer of military despatches. He granted my request. The steamer slowed down and I was roughly 'yanked' aboard by two deck hands. My shoulder joints ached for a week after.

"On reporting to Captain Fuller he was pleased that I was ready for duty, telling me to come on the following day. Then I was handed written instructions to proceed to Columbus, Ky., and relieve Manager Hill, who was sick; also that I would receipt to him for all telegraph property as well as his cipher book, which gave me the position of chief operator. This was very satisfactory to me, and to be candid, I was thinking of Miss Mildred while I was reading my instructions. On my arrival at Columbus I found Manager Hill a very sick man. He died soon after.

"When I had gotten matters in good shape I left an operator in charge of the office and, with my old friends, Dicus and Hendricks, rode out to inspect the wires on the Blandville road. Stopping there overnight, I asked about Miss Mildred and was informed that she had been absent several days on a visit to her aunt, Mrs. Henderson, who lived in the country near the Cairo road, along which the wire was strung. That morning we started out on the Cairo road and had gone a few miles when a lady was seen approaching, who proved to be Miss Mildred. Saluting and speaking to her as she stopped her horse, I directed my linemen to go and I would see them later.

"Turning my horse and riding by her side, I referred to the night I had made my escape, telling her that I had never divulged to any one the secret warning she gave me. She had a lover in

the Southern army who had returned home, I learned, and had called on her. Asking her about him, she said, 'If he should see us in company together he might begin shooting at a Yankee.' His name was James Hudgins. Coming to a country lane that led to the open woods in the Ohio River valley, we turned down the lane. Her father was a Baptist minister and a tobacco planter. She had two brothers in the Southern army. 'When the South had gained the victory over the North, no Yankees could live in Kentucky,' her mother had told her. After several hours had passed we started on a gallop back to the Cairo road.

"We had planned to elope and be married. Leaving her, I went to the house of Wiley Dicus. The plan was to meet at her aunt's house and go from there to Cairo, for the ceremony to be performed at the St. Charles Hotel. We met at the home of Wiley Dicus the following week and rode through the woods to her aunt's house, telling what was to occur, and asking her to be our friend. She proved to be so, and the 17th of March was the day set. Going to Cairo in advance, I made all the arrangements for the ceremony. Stopping with my friend Dicus on the night of the 16th, we took an early morning ride to Mrs. Henderson's house. There I saw Mildred standing out on the stoop, and soon she was ready to mount her spirited bay mare. Then, with Dicus, we rode to the ferry landing opposite Cairo, leaving him in charge of our horses. Crossing the river, we reached the hotel an hour ahead of the time I had fixed with the minister. Leaving Mildred in the parlor, I went to the telegraph office and told the operators what was doing, and got a glad handshake from them all. No relatives or dear friends were present at the wedding. The bride looked altogether lovely to me. Her age was eighteen; my age was twenty-eight. That evening we took a boat for Columbus to spend our honeymoon amid a military garrison prepared for battle at any time.

"Mildred and I wrote her parents, asking pardon for our elopement. No reply was made by them, but that did not mar our happiness. My salary was \$75 a month, greenbacks, equal to about \$30 in gold. Our board and washing was \$60 a month. The first calico gown my wife got cost seventy-five cents a yard, now worth about five cents a yard. It stood me in hand to do a little speculating, or grafting. Fortunately for me a draft for soldiers was ordered in west Kentucky among the 'secesh' people, who would pay almost any price for substitutes rather than stand up with Union soldiers to be shot at by their brother Confederates. An ex-military operator named Stillman was the drafting officer, a friend of mine; he put me onto the substitute business, in getting negro refugees to take the place of the white men drafted. With the aid of my trusted friend, Dicus, we secured six stalwart colored fellows who wanted to be soldiers and wear the blue uniform

and gilt buttons. Giving them comfortable quarters with plenty to eat, and some Kentucky whisky, we held them for the price of \$800 per head, greenbacks. When the drafted men were brought into camp I was ready for business, and sold them without any difficulty. I now had a bank account which enabled me to furnish a cottage in good shape for housekeeping.

"General Forrest was then raiding in West Tennessee. He made an attack on Fort Pillow, occupied by a regiment of negro infantry, who made a brave resistance, but were defeated. The negro soldiers were reported as brutally slaughtered after being made prisoners. We had no wire there, but army scouts reported the event. Also, that the enemy was advancing toward Union City, thirty miles distant from Columbus. Just at this time George Brush, an operator, reported to me for duty with a letter from Captain Fuller. He went to Union City to assist Operator McNairn in keeping the office working day and night. He had been there but three days when Forrest's command formed in line of battle, demanding a surrender, McNairn at his key telling me what was transpiring. Colonel Hawkins, who was in command, had a full regiment of brave western men. To the great surprise of all, Hawkins wilted and made a surrender. McNairn said to me, 'The white flag is up; the stars and stripes are down; good-bye; we are prisoners of war.' It was considered a most cowardly surrender. Hawkins and his regiment, with the operators, were marched away and placed in boxcars for a journey to prison pens. McNairn escaped from Andersonville Prison to the Gulf of Mexico, making his way alone through the swamps to Pensacola. Brush landed in Libby Prison, where he remained until the war closed, but he was paid his salary for the full time, though he did duty but three days. He met with a tragic death a few years later, on coming to visit his parents at Carbondale in the holiday season. He arrived on a night train and registered his name at a hotel, blotting the page by accident. The hotel clerk was drunk, abused him, and, pulling a revolver, shot Brush dead.

"Forrest's command then moved in the direction of Columbus. Now all was commotion. A Government boat lay at the wharf; orders were given for the women and children connected with Union officers to go aboard the boat and be transported out of danger to Cairo. I told Mildred that I must go to the fort on the bluff, that she had better go on the boat. No, indeed she would not, she said. So I left her with lady friends. All preparations were made at the fort for a fight. Soon, long lines of Confederate cavalry were seen in the distance. Two Confederate officers were escorted in by our mounted pickets. They demanded a surrender in General Forrest's name, and were told to return to their command, as no surrender would be made. When the two officers disappeared, the heavy cannon in the fort, manned by negro soldiers, began firing in the

direction where the enemy had been seen; no return fire was made. It was discovered that the enemy had moved away, taking a road in the direction of Paducah, where in a few days they made an attack on the Union forces under Colonel Hicks, who, with the aid of gunboats made a successful resistance and the enemy retreated with a heavy loss of killed and wounded.

"At Columbus the officer now in command was Colonel Lawrence of a New Jersey regiment, who was termed a 'dress parade soldier' by the husky western men. One day he came to my office in an excited manner, asking what business Major Dawson had with me so much, and demanding messages or copies. I informed him that no man's business in my office could be learned from me; that I had taken and subscribed to a solemn oath not to divulge the contents of any military despatches passing through my hands. He then threatened to place me under arrest and take possession of my office, when I informed him that if he should do so he would lay himself liable to be dishonorably discharged from the army service. Major Dawson was a gallant cavalry officer on detached service. He was the man who stood up and told the Confederate officer that no surrender would be made.

"Colonel Lawrence was relieved soon after, and Colonel S. G. Hicks, who had been badly wounded at the Shiloh battle, took command. He was from Salem, Ill., and a personal friend of President Lincoln. When the message was received announcing the death of Lincoln by the hand of an assassin, I handed the message to Colonel Hicks; his face became pale and the tears streamed down his cheeks. Other officers read the message in silence. The provost marshal ordered the stores to be closed. That was a day of gloom.

"The steamer City of Alton landed on her way to Cairo. Going on board, I handed the captain the death message. The cabin was crowded; officers in uniform were playing cards. Calling the attention of the people the captain read the message in a loud voice. An officer at a card table rose and uttered words of rejoicing over Lincoln's death, when another officer, denouncing him, drew a revolver and shot him dead. Such was the bitter feeling existing on that day.

"Dicus and Hendricks, the line men, were keeping the wires up in good shape. They reported to me that James Hudgins with three companions were prowling around the country committing depredations. Notifying Colonel Hicks of this, cavalry was sent out in search of them, with Dicus as a guide. The four bushwackers were captured without a fight and sent to the military prison at Alton, where Hudgins died.

"When the news was received of the surrender of General Lee and his army the Union people were jubilant, and the 'secesh' people seemed glad the cruel war was over. My office was now at the railroad depot. Soldiers of both armies were coming in on trains, bound for home. One

day when a train had arrived a man at the office counter asked for me. He wore a Confederate uniform. As I looked at him I concluded at once that it was Mildred's brother. Extending his hand to me, he said: 'I am Dr. Swain,' and that he knew no reason why we should not be friends. Opening the gate I invited him in. After a pleasant talk I took him out on the platform and pointed to the cottage on the hillside where he would find Mildred. When I went home she met me on the sidewalk, as was her custom, and, with a happy look, said: 'Brother wants to take me home with him. Would you care?'

"After her arrival there I received a message from her reading: 'Come home; we are all friends now.' Mounting my horse Sunday morning I made the ride in a happy frame of mind, and was welcomed to the hearthside. Her parents seemed gratified, and we all felt that with the close of the war all our troubles were over.

"On March 30 an operator named Richardson, who had been in the Confederate telegraph service, called on me with a letter from the manager of the railroad, stating that Richardson would take charge of the office. I wired my resignation to Colonel Van Duzer at Nashville, and received the following letter in reply:

Headquarters United States Military Telegraph, Nashville, Tenn., April 1, 1866.—R. B. Griffin, Manager United States Military Telegraph, Columbus, Ky.—Dear Sir: Your message of March 30 was received. I am sorry to hear that circumstances are such as to induce you to resign, and I sincerely regret the loss of your services. I found you during the four years of your connection with the military telegraph a sober, faithful and energetic assistant, and take pleasure in recommending you to telegraphers and business men. I should be pleased to hear from you in your new location, and I assure you that I am very truly your friend,

John C. Van Duzer,

Lieutenant-Colonel and Assistant Superintendent Military Division, Tenn.

Coming of the Telegraph and Express to South Bend.

BY CHARLES M. HEATON, WASHINGTON, D. C.

In the National Museum at Washington, in a case devoted to the exhibition and preservation of old-time telegraphic instruments, is a register and a relay which were in use in the office at South Bend, Ind., for nearly forty years. These instruments were donated to the museum by my father, Charles M. Heaton, who was the first operator in charge of the South Bend office. He had obtained them on one of his visits to the old home town from Thomas D. Baird, the last operator to use them when they were replaced by a new set. Father placed them in the museum for safe keeping and an honorable rest. They are located almost within arm's reach of the old locomotive, the "John Bull," which made the trip from Washington to the Columbian exhibition at Chicago, on its own wheels and with its own steam, to take its place among the locomotives of a later day. Put the electric spark of life into that old set of telegraphic instruments, and they

could still talk—who knows what ideas may pass between those two "Old-Timers" as they sit there in the silence of the dim midnight, while the watchman dozes and nods by the door.

But it is my intention to deal with facts rather than fancies. Mr. George C. Maynard, who is the custodian of this particular section of relics in the museum, tells me that the old register and relay from South Bend stands in age next to the first instrument used by Morse when he sent that famous first telegram from Washington to Baltimore, "What hath God wrought." He says there may be older instruments somewhere, but they are not in the museum. Mr. Maynard was an operator at Ann Arbor, Mich., many years ago.

In 1847-8 the first telegraph line came to South Bend and was known as the "Erie and Michigan." It ran from Buffalo through the following towns: Fredonia, N. Y.; Erie, Pa.; Painsville, Cleveland, Milan, Sandusky, Toledo, in Ohio; Monroe, Detroit, Ypsilanti, Ann Arbor, Jackson, Albion, Marshall, Battle Creek, Kalamazoo, Niles, in Michigan; South Bend and Michigan City in Indiana; Chicago in Illinois; Southport, Racine and Milwaukee in Wisconsin.

Ezra Cornell, afterward founder of Cornell University, was a prime mover in the project. Colonel John J. Speed was the first president of the company. He and Mr. Cornell had personal supervision over the construction of the line. We were living at that time on Pearl street, near the Pitts Taylor mansion, and I have a very distinct recollection of seeing the men putting up the wire (not wires) across the old wooden bridge that spanned the river at the foot of Washington street. They were building from both ends of the line at the same time, to meet somewhere in the state of Indiana. The western section came into the state first and an office was established at Michigan City, which was the first in the state. The second office was at South Bend, and this was early in 1848. They were much delayed in the construction of the line because of the difficulty of getting the wire in sufficient quantities, for, there being few railroads (none to South Bend) at that time, it had to come by the lakes and be hauled long distances in wagons.

There were no telegraph operators waiting for positions in those days and it became necessary to create them out of such material as could be found in each town the wires passed through. Colonel Speed was my father's cousin by marriage, and so father seemed to be the logical candidate for the position of operator. Some two or three weeks before the line reached South Bend, father received this old register, now laid away to rest in the museum, from M. B. Wood, a sub-contractor of line construction, with a line in which he remarked that it was a "beauty, right out of the shop." How many "beauties" have faded since then! The "Beauty" was put in proper place on the table and attached to a "local circuit" for the would-be operator to practice his Morse alphabet upon. In due time the line came

to town via Niles, over the old bridge, as I have said, and up to the office which was located on the east side of Michigan street, corner of Center, over Henry Barth's clothing store. Mr. Schuyler Colfax, later vice-president of the United States, had his newspaper office on the same floor. An experienced operator came to connect the instruments with the main line and give father some instructions, among other things how to adjust the instruments. This was rather a delicate operation for a novice. After a few days, however, the instructor took his departure for Michigan City, where he had another "plug" to look after. The next day there was trouble in the air. The instruments had dropped out of all signs of adjustment. Instead of that short, quick, staccato, that every operator likes to hear, the old register just sat there and ground its teeth. It is not likely that he felt that nervous exasperation crawl up his back and get under his scalp that every operator has felt while business is piling up on his table and no wire. He did not know enough, besides the people of South Bend had not taken to telegraphing with much avidity, and there was no business to pile up. So he began to call Michigan City, t y, t y, t y; then he wrote this sentence over and over again, "Put on more steam, put on more steam," then he would rest awhile and do it all over again. Because he got no answer was no sign he was not heard—not only at Michigan City, but every office on the line from Buffalo to Milwaukee had to stop all business and hear him cry for help like a lost boy in a dark cellar. Along in the afternoon the instructor started from Michigan City for South Bend. There was no railroad nor automobile—not even an airship line running to South Bend at that time, but like the little bug that has no wings he "got there all the same." I have heard my father tell this story many times. He said the instructor came flying into the office with, "What in thunder are you trying to do, Mr. Heaton!" He replied, "I want someone to put on more steam so that the thing will work." The instructor gave the relay a magic touch and everything worked right. He remained with father for a week or ten days, and left him quite familiar with the art.

My father's cousin, Jacob Morrell, cultivated a small farm some four miles north of South Bend in those days. He had a son, Thomas B., who was a very bright, intelligent boy. Father took him into the office to teach his telegraphing, and he soon became a good operator. One day, while sitting some distance from the instrument he remarked to my father that he could read by sound everything that was going over the line. Father being somewhat incredulous, went to the telegraph table, and in order to test the young man, set the paper going and told Tom to call out the words as they came, and sure enough they agreed with the written words on the paper. Neither one of them had ever heard of reading by sound. That does not prove, however, that

Tom was the first to discover that it could be done for it transpired later that it was being done in other parts of the country. The officers of the telegraph company disapproved of sound reading, fearing there would be many errors, and they issued orders that put a stop to it. Nevertheless Tom Morrell continued to work by sound, letting the paper run at the same time to be sure that he made no errors. He died in his twenty-second year.

Quite a number of good operators were graduated from the South Bend office under my father's instructions, one of them, Henry H. Matlock (now residing at Springfield, Ill.), was an operator in the War Department at Washington during the war, and I have heard him tell how Mr. Lincoln used to come and sit by him when a battle was on to get the news fresh from the line.

Miss Jeannette Briggs (Mrs. E. S. Reynolds) received the first telegram that ever came to South Bend for the general public. Here is another item that has chanced to come down through all these years. The receipts of the South Bend office for the month of November, 1848, amounted to \$8.55.

In 1852 the track of the Michigan Southern and Northern Indiana Railroad reached South Bend. With this road came the United States Express Company, and Henry Kipp, the general superintendent, appointed my father agent of the company. I was quite a long-legged boy at that time, and when not at school made myself useful as delivery boy.

About 1853 or 1854 the building in which the telegraph office was located took fire and was burned to the ground. The telegraph instruments were saved, but little else. Mr. Colfax's loss was also severe. He and my father secured rooms in the second story of the Sheffield building, which was on the west side of Michigan street, corner of Center. Two or three years later the office was moved to the St. Joseph Hotel building, next door to the post office, on Main street. In 1861 the office was again on Michigan street, in the Hendricks building, corner of Colfax avenue, at which time my father came to Washington, leaving me in charge of the business. In 1862 I removed the office to its former quarters in the St. Joseph Hotel building, where it remained many years. I left South Bend in 1865 and came to Washington, Thomas D. Baird becoming my successor in the express and telegraph office. In 1870 I returned to the old home town and became the first agent of the American Express Company when it reached South Bend over the spur of the Michigan Central road, which was built in that year. In 1874 I came back to Washington.

"The Practical Management of Dynamos and Motors," by F. B. Crocker and S. S. Wheeler, as indicated by its title, affords a clear understanding of the use, care and operation of these important adjuncts of the well equipped modern telegraph office. There is a constant demand for this book, for telegraphers find it an invaluable addition to their working library. There are 206 pages, and 60 illustrations; price, \$1. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Reminiscences of Old-Time Telegraphs at Chicago and Vicinity.*

BY J. NEWTON CRITTENTON, CHICAGO.

I entered the telegraph service December 7, 1854, at Marshall, Michigan, as a messenger, with the privilege of learning the business and receiving what fees customers would give for delivering messages.

Mr. N. Fleming was manager and gave me the Morse alphabet to learn. There was, then, only one wire between Detroit and Chicago. In a few weeks I was able to understand how the telegraph was worked; but this knowledge would not preclude the inclination to shake the long boxes under the table when some country friend was looking on with mouth and eyes wide open to see the message coming in on paper. This piece of playfulness would, however, be made up for by some crabbed customer upbraiding me for not readily reading his copy. The office was in the large wooden eating house adjoining the lunch counter, where, during train time, we assisted in serving the passengers.

As I was only a boy, the lines of cigars, tobacco and ales were safe in my hands; but I had quite an appetite for chicken pie.

This was the year of the beginning of the Crimean War, nine years after the telegraph was put to public use, and when there were only twelve thousand miles of line in the entire country.

At fourteen years of age I was made manager of the Marshall office, which position I filled for three years, thus giving me a good drill in business, making reports, etc.

The most use that the railroad made of the telegraph, for a year or so, was to report the coming of trains, number of passengers, accidents to trains and important railroad business. President John W. Brooks, of the Michigan Central Railroad, then said that he would have a railroad telegraph, no matter what the cost might be.

The years from 1854 to 1858 are so full of memories that it would be difficult to say where to start and where to end.

I well remember the impressions I had in delivering the first death message. Being ushered into the midst of the family gathered in the kitchen, the message was delivered and plunged the family into deep grief, coming as a thunderbolt in a clear sky.

The news of the surrender of Sebastopol, reaching us from one of our eastern sources of news, created a sensation.

The Erie and Michigan Telegraph Company's office was in one corner of the public hall. Back of the counter was an elevated desk on which were placed one Morse relay, register and key, and underneath two boxes for register paper, a Grove battery, one ground wire, one cut-off, with

usual books and blanks for registering, checking and reporting messages. This made up the equipment of the office at Marshall, where the railroad roundhouse, machine and carpenter shops and eating house were located.

I acquired the title of "Tight Breeches," arising, perhaps, from my agility in jumping over the high counter into the office, and the nickname of "Little Breeches" because of my diminutive stature.

In those good old days, before the people had learned the utility of the telegraph, we could go out and have a game of ball and return to the office without fear of being met with claims for delay of messages.

The main line was fed from Grove batteries at Detroit and Chicago. Mr. M. B. Wood was superintendent of the line. His wife who was a sister of Ezra Cornell, and had an office in her drawing room at Albion, twelve miles east, exercised a motherly care over the boys. At one time, I remember, Mr. Cornell gave me a good lesson in economy in the use of blanks; his decided manner throwing light on the remark which Mr. Wood once made in regard to the difficulty he had in bringing Mr. Hiram Sibley and Ezra Cornell to agree on a basis of union between the Western Union and Erie and Michigan lines.

After five months of student life I began to read by sound, and worked as a substitute at Jackson and Michigan City.

In the summer of 1858 the first Atlantic cable was laid and wild demonstrations of joy greeted the messages of the President and the Queen.

In the summer of 1855 I worked five weeks as an operator at Detroit, where the receipts were \$28 a day. I remember how in taking my departure, Manager Wendell, with a smile, seemed to think my satchel was larger than the boy carrying it.

I worked as a substitute at Lafayette, Ind., and also at St. Louis, Mo.

The trip to St. Louis was one of strange beauty; from Joliet to Alton, thence by steamboat, landing at the levee and reporting at the old office.

I have often smiled at my unsophisticated way at the dinner, where the table, I think, was waited upon by slaves, of drinking a large quantity of ice cold Missouri water in order to cool off. The more I drank the hotter I became.

I remained in the office there a few days and returned to Marshall, where, by the fall of 1858, the railroad line office was united with the Western Union office.

On the tenth of August, 1859, I went to Chicago, crossing the head of the lake on one and one-half miles of piling.

Mr. Emory Cobb, superintendent, put me on duty as the third or fourth day operator on the Western Union side of the main office, located on the second floor of the old Custom House building at No. 13 La Salle Street. The receiving counter was on the same floor. The branch office in

* This story was written by Mr. Crittenton some time before his death, which occurred in March, 1905.

the Board of Trade room was one block distant on South Water Street.

The news connected with the execution of John Brown was handled that fall.

In a few months the main office was moved to the southeast corner of Lake and Clark Streets, where the Western Union tables were on one side of the room and the Illinois and Mississippi tables on the other side.

The campaign of 1860 called for branch wires to the Republican wigwam. I remember that Robert C. Rankin, manager, used to "book up" business between times, while Mr. Cobb exercised personal supervision over the smallest matters.

Mr. Fred H. Tubbs, a fine young man, was chief operator of the Illinois and Mississippi side; George W. Felton, bookkeeper, with the same erect carriage as when he became manager of the office in later years.

The routine of the office was occasionally relieved by a political debate between the superintendents, Messrs. Cobb and E. D. L. Sweet, supplemented with variations from the "smaller fry."

I boarded at first at 147 East Monroe Street, afterwards in a large frame house at the southeast corner of Lake Street and Michigan Avenue. The "ups and downs" of Chicago life, at that time, were proverbial, as the streets and sidewalks were being raised six to eight feet. The city contained only about one hundred thousand inhabitants.

The cattle yards were at Bull's Head, two miles west of the office.

Of eastern wires we had one to Buffalo, and when weather permitted, through repeaters to New York; a Michigan Central wire to Detroit; a Michigan Southern wire to Toledo and Cleveland and perhaps Cincinnati; one or two to Milwaukee; one on the Fort Wayne road, and one shorter wire. These last two I worked. Of the operators who worked the other wires, I remember Mr. George A. Burnett.

Messrs. Rankin and Burnett took press reports, the manifold books being placed on the eastern table about "report time." Manifold typewriting was unknown, but the receiving operators made very good time and copy.

The public news was absorbing, and many noted persons were at the time passing through Chicago.

Colonel Ellsworth, with his attractive military bearing, was a familiar figure on the street. I heard Stephen A. Douglass speak from the balcony of the Tremont House and shook hands with Abraham Lincoln and wife in the parlors of the same hotel just after election.

The Prince of Wales passed the office on his way to Dwight, Ill., where he went to shoot prairie chickens.

Trips in the country were not very extended in those days. Calumet River was regarded as way out in the country, and Evanston was con-

sidered farther away than Milwaukee is now; the Desplaines River was little heard of.

The tariff to New York at that time was two dollars. In times of rush Superintendent Emory Cobb would help out at the wire. In the spring of 1861 I took charge of the branch office in the Sherman House, where I remained until fall, when I entered the United States military telegraph service.

[The story of Mr. Crittenton's military career has appeared previously in our columns. Interesting reminiscence in regard to the Chicago office after the war was printed in the February 16, 1909, issue of *Telegraph Age*.—Editor.]

Seeing by Telephone.

To allow people conversing by telephone to see one another is known to be the ultimate goal of those inventors to whose labor we are indebted for the evolution of the telephotographic apparatus. As the problem has not up to the present time been practically solved, inventors have been satisfied with transmitting, by wire, photographic pictures, diagrams, handwriting and the like. According to reports received recently from Denmark, a satisfactory solution is now offered. In fact, two young Danes have submitted to the editor of a Copenhagen daily, the principle of their idea, particulars of which have not yet been given out. Unlike the Korn apparatus, optical transmission, according to their scheme, is not effected by means of any material sensitive to light, such as selenium, nor is a picture produced by photographic or mechanical means, as in all the apparatus so far suggested. Transmission, in fact, takes place simultaneously, so as to reproduce any objects situated at the sending station in their natural colors and motions, their dimensions, however, being reduced. The apparatus is connected by a contact with the telephone wire, when the acoustic or optical currents can be thrown alternately through the line. The operator is thus able at will to show himself, or to bring before the eyes of the persons at the other end any objects he may like to show him. As the apparatus, so far from being necessarily located immediately beside the telephone, can be used within a considerable range, provided the contact be obtained, the possibilities of this invention are obviously many. Further details will be awaited with interest.

Mr. Harvey P. Dwight, president of the Great North Western Telegraph Company, in renewing his subscription recently, wrote:

"Enclosed find remittance for renewal of my subscription to the 'Age.' I should be lost without it, so far as telegraph matters are concerned. Not only do you give us all needful and interesting information in the telegraph world, but typographically 'Telegraph Age' is a work of art. It would be hard to suggest an improvement in either respect."

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

Invisible Light and Inaudible Sounds.

BY L. R. GLEASON.

That there should be such a thing as a sound that one cannot hear may at first seem strange to the reader, but the explanation is simple enough and easily understood.

Every schoolboy knows that if he sticks a pin in his desk and flicks it with his finger-nail a fairly strong, metallic sound is produced. This is due to the vibration of the pin and similarly all sound is due to vibration; whether that of a string, reed, column of air or the humming sound produced by flies, bees and mosquitoes.

The difference between sounds is due to the speed of the vibrations which produce them, thus the long, heavy wires of the bass clef of the piano vibrating slowly, produce a low booming sound while the short, slender wires of the treble clef, vibrating at a high speed, produce a shrill, piercing note.

Just as there are limits to the heights to which a balloon can ascend or the depths to which a diver may descend so there are limits of vibration beyond which the human ear is incapable of the perception of sound.

If a string vibrates at a speed of less than thirty vibrations per second, no sound is produced which is audible to our ears and, on the other hand, we are equally deaf to the sound produced by a string vibrating more than forty thousand times per second. The lowest note produced by a piano is due to the string vibrating forty times per second while the highest is produced by a string making four thousand vibrations per second.

The buzz of a gnat is caused by its wings beating the air fifteen hundred times per second.

But, although the human ear may not be sensitive to sounds produced by a higher rate of vibration than that mentioned, there are other and more sensitive ears. Professor Galton devised a whistle which emitted a note absolutely inaudible to the human ear, yet his dog heard and obeyed the whistle.

It is by means analogous to this that wireless telegraph stations are enabled to preserve secrecy; they are so attuned that the instruments at the one station only respond to the impulses sent out by the other station and are as inaudible to any "outside" station as was Galton's whistle to any ears save those of the dog. When several stations are working at nearly the same wave-length, that is; are sending out nearly the same number of vibrations, the result is confusion, but if one of them is just appreciably different from the others the receiving station can "tune up" to it and lose the others. The writer has seen a high power trans-atlantic sending station completely "tuned out" at a very short distance and a feeble, miniature station "tuned in." The large station could burn up the receiving instrument under ordinary circumstances, but became inaudible when the receiver was no longer adjusted for its vibration period.

The human eye, in common with the ear, also has its limitations. A ray of sunlight, passing through a prism, is split up into the beautiful resemblance of the rainbow and the colors appear in the following order: Red, orange, yellow, green, blue, violet and indigo, the brightest part of the "spectrum," as it is called, being the middle where the orange, yellow and green bands appear while the blue and indigo end appears to vanish in darkness so far as our eyes can perceive. Nevertheless, there are in this region of seeming darkness rays of strange and wonderful properties which, though invisible to our eyes, can affect us most powerfully.

Scientists call them the "ultra-violet" rays and they are of great value in treating certain forms of skin disease and are in daily use in medical practice. Strange to say, these rays cannot pass through ordinary glass and for this reason the lamps producing them are fitted with lenses of quartz glass which, to us, does not seem to differ from ordinary glass. They can also pass through ice.

The X-rays, which have been of such great service to humanity in many ways, notably in enabling surgeons to locate bullets without using the probe, thus sparing wounded soldiers pain and lessening the risk of blood-poisoning, are also absolutely invisible to the human eye, but a photographic plate is as much affected by them as it is by strong sunlight. Still, they will not pass through glass if it contains lead, though it may appear to us as clear as the best flint glass.

These phenomena are all due to differences of vibration and, as the ear is unaffected by vibrations above or below a certain definite frequency, so is the eye insensitive to light beyond certain limits of vibration of the ether for light, like sound, is produced by vibration. Even the camera has its limitations for the plates which the photographer develops by the light of his red lamp are unaffected by its rays which are so strongly visible to us yet are extremely sensitive to the ultra-violet and X-rays which we cannot see.

A Valuable Telegraph Book.

"The Hughes and Baudot Telegraphs," by Arthur Crotch, of London, the well-known electrical engineer and author, is a book that everyone interested in printing telegraph systems should possess. The volume contains a very full description of the two mentioned type-printing telegraph systems used so generally in Europe, the Baudot in France and the Hughes elsewhere on the Continent. The illustrations are numerous and clear, and all together, the book furnishes a fund of carefully stated information valuable to the student and also of interest to the lay reader. This book may be obtained of J. B. Taltavall, Telegraph Age, 253 Broadway, New York, and will be sent to any address, carrying charges prepaid, on receipt of price, \$1.00.



Western Electric "BELL" GRADE Train Despatching Telephones

HAVE THE
**QUALITY—EFFICIENCY
RELIABILITY**

NECESSARY FOR RAILWAY SERVICE

Over 50,000 are giving satisfactory service for many of the largest railroads in the country. They afford the most efficient and economical service and increase the rapidity and accuracy with which orders may be transmitted and received. Call upon our special railway engineers for consultation and suggestions. Write our nearest house.



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CELEBRATED "BELL" TELEPHONES

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ARE USED ON **MORE MILES OF R. R.** THAN ANY OTHER MAKE

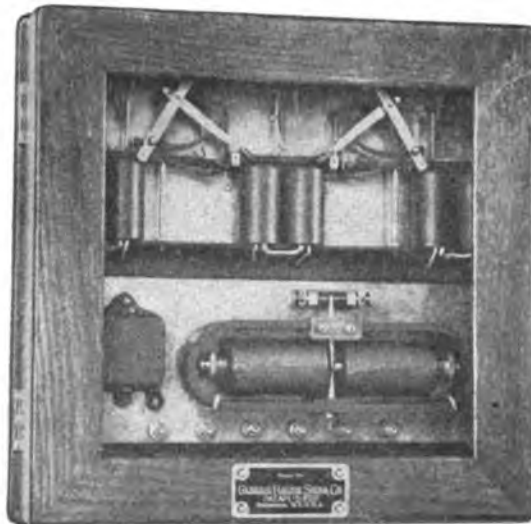
Most **Reliable**

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DESCRIPTION
ON
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MODEL 1—FORM B.

GENERAL RAILWAY SIGNAL COMPANY

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KERITE



Insulated Wires and Cables

KERITE has back of it an unequalled record of half a century of successful service under the most adverse conditions. It improves instead of deteriorating with age.

Efficiency and safety in electrical installations depend chiefly on insulation. For fifty years KERITE insulation has been the standard of excellence.

Results count. KERITE wires and cables installed half a century ago are in service to-day. The wonderful durability of KERITE insures the highest safety and economy.

Initial tests determine the properties of an insulation only at the time they are made. They do not determine how well it will do its work years afterward.

The indestructibility of KERITE and its power to resist deteriorating influences should be carefully considered in specifying an insulated wire or cable.

Experience of others should be useful to you. Insure your service by using KERITE.

KERITE INSULATED WIRE AND CABLE COMPANY

INCORPORATED BY W. R. BRIXEY

Sole Manufacturer

Hudson Terminal, 30 Church St.
NEW YORK

Western Representative

WATSON INSULATED WIRE CO.

Railway Exchange, CHICAGO, ILL.



The Railroad.

W. J. Williams has been appointed superintendent of telegraph of the St. Louis Southwestern Railway and the St. Louis Southwestern Railway of Texas, with office at Tyler, Tex., succeeding G. C. Montaique.

The office of B. B. Baughman, superintendent of telegraph of the Wabash-Pittsburg and the West Side Belt Railroad, has been abolished and these duties have been assumed by C. O. Dambach, trainmaster, with office at Pittsburg.

The telephone train-despatching circuit which the New York, New Haven and Hartford Railroad Company will install upon the Northampton division will have a total length of seventy-seven miles, with twenty-nine stations.

The Canadian Pacific Railway now has in operation telephone lines from Carlin, Ont., to Brandon, Man., a distance of 1,045 miles. It is also expected that the telephone line from Swift Current to Medicine Hat, 150 miles in length, will be completed before the end of the year.

The fall meeting of the Eastern Division of the Association of Railway Telegraph Superintendents occurred at Washington, D. C., November 18. The principal subject brought up for discussion was the proposed new standard railway contract of the American Telephone and Telegraph Company. This was carefully considered, clause by clause. Mr. Charles Selden, superintendent of telegraph of the Baltimore and Ohio Railroad, Baltimore, was re-elected chairman of the division for the ensuing year. Several of the supply men were present, some of them showing their apparatus. Following the public meeting an executive session was held.

A telephone train-despatching circuit has recently been completed and put into service by the Atchison, Topeka and Santa Fe Railroad Company on its Illinois division, between Chillicothe, Ill., and the Dearborn Street station, Chicago, a distance of 134 miles. On this circuit the despatcher is located at Chillicothe. There are thirty way stations in which telephones and selective equipment have been installed. With the completion of this circuit the Atchison, Topeka and Santa Fe trains running out of Chicago are handled by the telephone as far as Newton, Kansas, a distance of 660 miles. There are on this section a total of 170 way stations.

Mr. S. A. D. Forristall, superintendent of telegraph of the Boston and Maine Railroad, was a recent New York visitor. The telephone despatching circuit upon the Fitchburg division of the Boston and Maine which was placed in operation in September of this year, has given such satisfactory service that preparations are now being made to install similar equipment upon the Concord division, seventy-one miles in length, and the White Mountain division, ninety-four miles in length. It is hoped to have the new circuits in operation by February 1.

Radio-Telegraphy.

Mr. C. E. Elwell, of San Francisco, has purchased the American rights for the Poulsen system of wireless telegraphy.

The new high-power wireless station in the Champs de Mars, Paris, has recently been completed.

The Australian government has made an allowance in their estimates of £10,000 for the establishment of two wireless stations, one at Sydney and the other at Fremantle or Rottneest.

The report of Lloyd's Register of British and Foreign Shipping for the year 1908-9 states that there are at present recorded in their register book 404 vessels fitted with wireless telegraphy, and 362 with submarine signaling apparatus.

At the regular monthly meeting of the Wireless Institute of New York, to be held in the Engineering Societies Building, December 1, Mr. W. E. Smith will present a paper upon "Conversion of Electric Oscillations Into Continuous Current by Means of a Vacuum Valve." At the following meeting, January 5, Mr. L. R. Gleason will read a paper upon the subject of "Measuring Instruments and Measurements in Wireless Telegraphy."

The Russian government has just closed contracts for several wireless stations in northeastern Siberia, among which are two of eight kilowatt capacity, with a guaranteed day and night range of 1,500 miles, for Petropavlovskii in Kamchatka and Nikolaievsk on the other side of the Sea of Okhotsk. All of these stations will be equipped with the Telefunken Company's new "singing spark" apparatus and will be used to establish communication between several other important points up and down the coast and in the interior.

A novel form of relay has been devised in England for use with the telephone receivers of wireless telegraph systems. It consists of a step-down transformer, the secondary of which is connected to the electrolytic detector, while the primary is connected to the telephone receiver. The former has a resistance of 450 ohms and the latter a resistance of three ohms. A carbon rod rests on the diaphragm of the telephone receiver while the opposite end engages a carbon block, thus forming a microphone. The second telephone is placed in circuit with this microphone and a battery, and thus reproduces the wireless signals so loudly that they can be heard throughout a large room.

Important experiments in long-distance wireless communication will be carried on by the United States Navy during the month of December. A tower 400 feet high has been erected at Brant Rock, Mass., and the necessary instruments installed, with a view to communicating a distance of 3,000 miles. Two United States scout cruisers, the "Salem" and the "Birmingham," will be despatched in the early part of December on a trip which will keep them within the 3,000-mile radius of the transmitting station, and these ves-

sels will be utilized as receiving stations for the wireless experiments. The proposed cruises will probably be in a region comprised between the coast of Scotland and the West African coast, and also in the American tropics. The vessels, which are each equipped with a ten-kilowatt apparatus, will also experiment in long-distance work, up to a radius of 1,000 miles, between ships at sea.

Crystal Type of Wireless Detector.

In a recent article in the *Electrical World*, Mr. L. W. Thomas describes some of his experiences with the crystal type of wireless detector. The perikon detector proper consists of two crystals or minerals, one of them being chalcoprites ($\text{Cu}_2\text{SFe}_2\text{S}_3$) and the other zincite (ZNO). In a convenient form of mounting, from six to seven small pieces of the zincite are secured by mercury amalgam in a brass cup-shaped disk, the disk being held stationary by a screw. The chalcoprites is mounted singly and eccentrically in the same manner in a smaller cup, and by a slight spring tension it is made to press lightly against the zincite. This crystal is mounted eccentrically and the holder on a swivel so that it can be swung and tuned and the most sensitive point of contact thus found. Usually there are found one or two places that are extremely sensitive.

Should a strong spark or signal be received across the perikon it will instantly become deadened, the incoming signal being reduced in intensity as much as sixty-five per cent., but upon giving it a short rest—depending upon the intensity of the shock—its sensitiveness is restored. As the zincite is the only one of the crystals affected, by moving the chalcoprites to one of the other zincite crystals another place of sensitive contact may be found. Flat pieces of zincite, free from any foreign substance, and clear-pointed pieces of chalcoprites give the best results. When transmitting is being done, the detector needs, of course, to be short-circuited or shunted.

The carborundum detector may be made up in the same manner. A number of small pieces of the carborundum may be mounted similar to the zincite crystals and a common steel needle, about one-half inch in length, takes the place of the chalcoprites and is attached to the rim of the cup so that any piece of the carborundum can be reached and the most sensitive place thereby located.

Carborundum varies greatly in its sensitiveness, but a somewhat flat, bright piece usually gives the best results. The spring tension of the needle against the crystal needs to be just sufficient to keep the needle from being easily disturbed by a jar. The carborundum detector does not require a battery, and, as with the perikon, a low-resistance telephone is preferable. There is very little, if any, difference whether the needle point or the crystal side is connected to aerial.

By using the carborundum in connection with the perikon detector there is obtained a most sat-

isfactory combination which will receive signals of the strongest or weakest intensity, the carborundum detector being simply shunted around the perikon. A switch is used to cut in either detector, depending upon the character of the signal being received. The carborundum needs no short-circuiting switch when transmitting, as it is not affected by the spark. The receiving signals of both the perikon and the carborundum can often be improved by cleaning the crystals with carbon disulphide.

Underwriters Favor Wireless for Ships.

It is stated that the past year has been so disastrous to the London ship underwriters that a great impetus has been given to the study of new safety appliances and to the development of those now in use. The underwriters of Cape Town, who have also suffered heavy losses, have unanimously recommended the installation of wireless telegraphy on all passenger ships.

"Such a step would be welcomed by all underwriters," stated a high shipping authority, "and it would be warmly welcomed by those in Liverpool. It would tell against underwriters as a class, for the installation of wireless telegraphy on a ship would materially reduce the amount of the premium; but on the ground of humanity we are greatly in favor of every ship having its wireless apparatus. There is no necessity for us to have a special meeting on this matter, for all Liverpool underwriters are in accord with one another on the subject. It is no use leaving it a voluntary business. To be of any use it must be compulsory and universal. Nevertheless, we cannot make a recommendation on the subject, because we recognize the great cost of placing a wireless outfit on each ship. It might not be so difficult for the great lines, but it would be almost impossible for the owners of tramp steamers. Until the cost of wireless installations is materially reduced we must not expect to see it in universal use."

The Hudson Word Counter.

Every telegrapher who operates a typewriter should have it equipped with a Hudson Word Register, which is now placed on the market by a manufacturing house which has the reputation of producing the very best material and goods of a superior quality. This simple yet accurate device for counting words written upon the typewriter is easily read, instantly set and has a recording capacity up to 1,500. It unerringly registers the number of words written and thus obviates entirely the necessity and annoyance of counting checks. It can be supplied with attachment for any standard make of typewriter. The device is made in compact form, carefully finished and is an ornament as well as a labor saver. The price is \$5.00 and orders may be sent to J. B. Taltavall, Telegraph Age, 253 Broadway, New York. Orders should state what make of machine it is to be used on as attachments differ.

Sandwich Central Energy Selector

OUR LATEST DEVICE

☐ We have just developed our No. 5 Selector which entirely eliminates battery at the sub-station, both the selector and bell being operated by the dispatcher's battery.

☐ No departure has been made in our step by step operation which has proven the most satisfactory and reliable system and both styles will work on the same circuit.

☐ Entire selector equipment in one cabinet, including selector, bell, answer back and resistance coils.

☐ The only selector on the market using no local battery.

Write us for further information.

SANDWICH ELECTRIC CO., SANDWICH, ILL.

**KELLOGG TELEPHONE
TRAIN DISPATCHING SYSTEMS
IN OPERATION
ARE OUR BEST ADVERTISEMENT**

☐ The Kellogg system ensures safety in the handling of trains, saves time, and is economical.

☐ Many of the best known roads have adopted the Kellogg System.

☐ Write for our bulletin No. 37 and booklet "What they think of the telephone in train dispatching."

**KELLOGG SWITCHBOARD & SUPPLY CO.
CHICAGO**



Cell Saving

Mr. Superintendent of Telegraph:

Let us tell you of a railroad official who saved \$1,808 for his company in two years by using DRY batteries instead of Gravity Cells.

Rock Island

Dry Batteries are the only hand-constructed cells on the market. Don't YOU want to know how to make a big showing in your department?

Write TO-DAY for Battery Booklet and samples of our Standard Cells—No. 6 (2½ x 6 in.), and No. 8 (3½ x 8 in.).

**THE ROCK ISLAND
BATTERY COMPANY**

909 Sycamore St., Cincinnati, Ohio



The Cleveland Office for Forty Years.

BY A. G. PAINE.

This year of 1909 being the fortieth anniversary of the Western Union Telegraph Company's moving into the building they are still occupying in Cleveland, on the corner of West Ninth Street and Superior Avenue, it seems appropriate that the year should not pass without something to call attention to this quite unusual event.

Through the kindness of Mr. Albert J. Desson we are able to furnish a photograph of this building, together with a short history of the office during the past forty years.

This building was formerly called the Bank Building for it was a bank building, two banks occupying the whole first floor. The Western Union receiving room was located in the basement. The superintendent's office, the late E. P. Wright then being the incumbent, was on the



WESTERN UNION OFFICE, CLEVELAND.

second floor. The operating room was on the fourth floor, occupying one-fourth the space we now require.

At present the entire third floor is given over to the operating room, the Commercial News Department being on the fourth floor. The American District Telegraph Company has quarters in the basement. The receiving department is on the first floor with the manager's office and the superintendent's office on the second floor. Mr. John Fitzpatrick is the present superintendent. The city lines and also the Barclay printing departments are in L's off the operating room. The Western Union Telegraph Company moved into the present building in 1869 from the corner of Bank and St. Clair Streets. At the time of the consolidation with the American Union Telegraph Company the Western Union moved across the street, occupying the northwest corner in 1881, but after remaining there about five years, they moved back to the old location. When the office was originally moved in 1869 to the present location, Mr. A. M. Van Duzer, who is now living in retirement in Cleveland, was manager, and C. F. Stumm was chief operator. Since that time there

have been eight managers, namely: H. L. Melton, L. A. Somers, N. A. Buell, T. H. Hill, Isaac Morris, F. C. Hackett, J. T. Hanford, and the present manager, J. W. Tillinghast. The chief operators since Mr. Stumm have been as follows: George H. Wadsworth, O. A. Gurley, Isaac Morris, L. G. Seibel, W. C. Wood, and the present chief, F. J. Dayman.

The force at the time of the removal in 1869, besides those already mentioned, consisted of the following: Charles Douglas, private secretary to Superintendent Wright; Frank Douglas, clerk; H. L. Melton, in charge of the supply department; N. A. Buell, clerk; Eugene Tindall, assistant chief operator; William A. Manning, all night chief; Albert J. Desson, J. P. McKinstry, William H. Eckman, Colonel Wilson, E. E. Angell, J. D. Stough, David M. Hall, M. E. Cozzens, W. H. Wilson and Orlando B. Nash, operators.

All are now dead with the exceptions of A. M. Van Duzer, H. L. Melton, Charles and Frank Douglas, William A. Manning, N. A. Buell and Albert J. Desson.

Some of these have met with prosperity, others did not. Charles Beardslee, at one time delivery clerk, is now secretary of the Cleveland Gas Company.

William Holmes, the present chief of the Tariff Bureau, New York, had already departed for that city before the removal to the present location.

Of the men who were in the employ of the company when it moved to its present quarters forty years ago, only two remain in the office, namely: Mr. N. A. Buell, receiving clerk, and Mr. Albert J. Desson, still in harness in the operating room. The latter carried messages to Camp Cleveland, in 1863, and worked a long time as operator with the late Louis A. Somers, in the old Marine office. In this office Mr. Desson taught the art of telegraphy to Mr. J. B. Taltavall, publisher of Telegraph Age, and they have since that time been steadfast friends. Mr. Desson is still hale and hearty, although sixty-two years of age. He is a gentleman of quiet demeanor, and strictly attends to his business. He has a record of forty-six years of service with the company, and of having in that time lost but thirty days on account of sickness. He has lived in Cleveland fifty-two years, and has witnessed the growth of the city from 40,000 inhabitants to over 500,000.

Mr. N. A. Buell, like Mr. Desson, carries his years well. At the time of the removal to the present quarters, he was bookkeeper, having succeeded Mr. Beardslee. Mr. Buell began his career with Mr. William Holmes, who had charge of the Tariff Bureau (even at that early day), beginning with him in August, 1863. The following year he became manager of the Warren, O., office, until the spring of 1865, when he returned to Cleveland and re-entered the Supply Department with Mr. H. L. Melton, remaining there until 1867, when he became clerk for Mr. A. M. Van Duzer (who was manager at that time), and

later on he himself became manager. Mr. Buell's father, M. A. Buell, was the first telegraph instrument maker in Cleveland, and made instruments for the Western Union Telegraph Company for many years. His factory was located in the Waring Building, corner Bank and St. Clair Streets, the same building that the Western Union moved from in 1869.

The following is a list of chiefs in the operating room at the present time: F. J. Dayman, chief operator; M. D. Combs, traffic chief; J. T. Hanford, quad chief; Frank Hertzner, night chief; C. F. Williams, all night chief; Fred Diebold, way chief; Frank Carpenter, night way chief; Henry Long, chief city wires; Benjamin Plummer, night chief city wires; Max Handler, chief Commercial News Department; Thomas Brady, assistant chief Commercial News Department; Charles Sears, chief Barclay Department; Archie Spillers, and Joseph Wertman, electricians, Barclay Department; Thomas Baker, chief wire chief; W. H. McCormick, George Havens, William Gales and J. T. Rice, wire chiefs; Joseph Wissimer, loop chief; Charles Nash, night loop chief; John Travers, C. J. Rawlinson and William Bligh, repeater chiefs.

British Postal Telegraphs.

The report of the Postmaster General of England, just issued, shows that during the year 1908-9 84,825,000 telegrams were transmitted, a decrease of one and three-tenths per cent. The total number of telegraph offices is now 13,490. The number of foreign telegrams, inward and outward, was upwards of 9,421,000, an increase of more than 274,000. Twenty-eight licenses, covering forty-eight installations, were granted for experimental wireless stations.

The telegraph revenue of the year was £3,099,724, a decrease of £1,216, and the expenditure, including interest on purchase capital was £4,218,659, an increase of £44,776, leaving a net deficit of £1,118,935.

There are now twenty-five commercial, eleven private, and one hundred and sixty-four experimental wireless stations in the United Kingdom.

The underground telegraph line between Glasgow and Edinburgh is practically complete; the line running south from Newcastle has reached Stockton-on-Tees; that to the west, Penzance; and the extensions from Birmingham and Bristol have reached Worcester and Berkeley. It is intended to provide underground connections with the landing places of the principal submarine cables to the Continent.

The total number of British merchant ships now equipped with wireless apparatus is over one hundred, most of them being Atlantic liners. The number of outward radio-telegrams dealt with during the year was 1,817, and inward 22,732.

The mileage of wire in the Post Office system now amounts to 304,562 for telegraphs, 548,694 for telephones, and 193,656 for private lines—total 1,046,912 miles—of which 412,434 miles are aerial, 632,930 underground, and 10,548 submarine.

Annual Meeting of the Telegraphers' Mutual Benefit Association.

The forty-third annual meeting of the Telegraphers' Mutual Benefit Association was held in the Western Union Building, 195 Broadway, New York, on November 17, Belvidere Brooks, president, in the chair.

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

It again gives me pleasure to call your attention to the very satisfactory condition of our association, of which the details for the past year are shown in the reports of the secretary and treasurer about to be submitted to you.

The net increase of membership in the full grade is the largest we have made for the past seven years, while the net increase in the half grade is well above the average, indicating that the business conditions prevailing at the time of our two last annual meetings have materially improved, and that we can with confidence look to the future for an extending field of usefulness.

The salient points shown in the treasurer's report are that payments amounting to \$76,286.33 were made to the beneficiaries of our deceased members, every claim being paid promptly, and in full when due, with one exception, part of which was withheld awaiting the coming of age at an early date of a minor beneficiary; and that the invested assets and cash in hand have increased \$21,041.29 since last report.

It affords me especial pleasure to place on record the grateful thanks of the association for two bequests received during the year. The first of \$500 from the estate of the late Orrin S. Wood, who sometime before his decease had named the association as beneficiary for that amount. The other of \$5,000 from the estate of the late Luther G. Tillotson, through the will of his widow, Emma A. Tillotson.

These two amounts, less the inheritance tax on the Tillotson bequest, were added to the reserve fund to be invested in mortgage bonds. These bequests (as well as that of the late General Anson Stager, who prior to his death in 1885 directed that the amount of his insurance \$1,000 be retained by the association) are now part of the reserve fund, and will long serve as enduring memorials to the memory of those members.

I trust that future presidents may also have the pleasure, during their incumbency, of acknowledging similar splendid examples of generosity on the part of many now in the vigor of life, who are deeply interested in the welfare of the association.

It will be noted that the reserve fund now amounts to \$317,040 par value, or more than six per cent. of the total contingent liabilities, yielding an annual revenue of more than \$15,000, increasing every year, as each year's interest or an equivalent amount is added to the principal.

The necessity, which required the membership to contribute directly to the fund, has thus practically ceased, and the entire net revenue derived from assessments as levied is therefore available for payment of death claims as they arise, thereby furnishing the insurance to the members at actual mortality cost.

Nothing can better illustrate the advantage afforded to the young telegraph or telephone employe, in joining in membership with this association, which offers the safest and most economical form of protection for the family and dependents yet devised.

I desire to thank the members present for their attendance, and the executive committee and agents for their active co-operation and assistance during the year.

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

The secretary's report shows that the total membership is 4,630 in the full grade, and 763 in the half grade.

The sum of \$15,000, together with the net amount, \$4,750, received as bequest from the late Emma A. Tillotson, and \$500 from the late Orrin S. Wood were carried to the reserve fund, which now amounts to \$317,040.73. The assets of the association were shown to be of an amount exceeding a reserve of six per cent. on the total amount of insurance carried by the association.

The receipts for interest during the past year on investments of the reserve fund and current deposits amount to \$15,796.44. The income derived from interest is nearly triple the amount of the annual expenses, and is equivalent to nearly three assessments on the entire membership.

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

In a brief address, Secretary O'Leary gave some interesting statistics regarding the work of this association since its organization, starting in 1867 with 125 members, in 1877 it had 1,822 members and assets of \$14,000; in 1887, 3,263 members, with \$70,000 assets; to-day it has 5,393 members and assets of \$331,000. Up to date 12,439 members have been enrolled of which 1,534 have died in good standing, this number, together with present membership of 5,393, showing that 5,512 from one cause or another have allowed their membership to lapse. He depicted how oftentimes he as well as his predecessors were confronted by a beneficiary who after the death of the member had come across a certificate of membership and hoped that it would prove of value, only to find that the membership had lapsed, possibly years previously, but more often only a few months before, and how incomprehensible it was that a person would sacrifice an estate of \$1,000 for the sake of a single dollar necessary to pay the assessment as levied.

Among those present were: Colonel R. C. Clowry, B. Brooks, William Holmes, J. B. Taltavall, A. R. Brewer, J. W. Schmults, W. J. Dealy, George Rochm, C. M. Cunningham, R. G. Page, J. C. Robinson, F. J. Scherrer, T. E. Fleming, F. E. Hutchinson, J. H. Montgomery, C. P. Bruch,

H. V. Shelley, W. H. Jackson, E. B. Pillsbury, J. W. English, F. O'Ryan, J. A. Dierks, J. H. Tingle, B. Bernstein, W. L. Ives, J. W. Gibbons, H. C. Lockwood, D. W. Meck, H. F. Van Every, A. M. Guest, D. C. Sullivan, E. Mesler, D. J. Murphy, G. W. Logan, T. J. Cusack, F. E. Coyle, E. M. Mulford, M. J. O'Leary and H. J. Gillen, all of New York; S. B. Curtis, Hartford, Conn.; W. P. Cline, Wilmington, N. C.; J. E. Golden, Bradford, Pa.; A. M. Smith, Paterson, N. J.; S. S. Garwood and C. E. Bagley, Philadelphia; J. J. Welch, Chicago, Ill.; A. Watkins, Richmond, Va.; F. B. Travis and N. R. Young, Washington, D. C.; P. J. Farrell and C. A. Richardson, Boston, Mass., and H. D. Reynolds, Buffalo, N. Y.

Serial Building Loan & Savings Institution Financial Report.

The assets and liabilities of the Serial Building Loan and Savings Institution at the close of business on the 30th day of September, 1909, as found upon examination made by the direction and authority of the Superintendent of Banks of the State of New York, were as follows:

Assets.	
Loans on bonds and mortgages	\$435,213.00
Loans on shares	6,635.00
Real estate	14,659.75
Real estate contracts	8,507.52
Advances for taxes, etc.	2,485.11
Cash in bank	3,071.53
Interest accrued	2,102.37
Interest due	3,350.34
	\$476,024.62
Liabilities.	
Due shareholders	\$250,339.00
Earnings credited	59,923.58
Juvenile shares	418.37
Matured and prepaid shares.....	83,800.00
Borrowed money	41,570.48
Due to complete loans	250.00
Maturity fund	1,062.69
Interest accrued	1,068.74
	\$438,432.86
Surplus and undivided profits	\$37,591.76

The regular December meeting of the shareholders will be held at the office of the company, 195 Broadway, New York, Tuesday, December 21, for the purpose of nominating officers and directors. The annual meeting for the election of officers will occur Tuesday, January 18. The annual meeting will mark the completion of twenty-five years since the organization of the association, and plans are being made for a suitable remembrance of the silver anniversary.

Mr. C. W. Garver, manager of the Western Union office at Ashland, Ohio, in renewing his subscription recently, says: "During the past fourteen years I have been a close reader of the Age. The articles appearing on the subject of 'Some Points on Electricity' and upon the improvements of the telegraph are certainly worth many times the price of subscription, and no up-to-date manager should be without the paper."

Obituary.

S. B. Russell, a prominent telegrapher of Augusta, Ga., died in that city November 11.

Miss Jennie Whetmore, manager of the Postal Telegraph-Cable Company's office at Houlton, Me., died November 16, aged fifty years.

Wm. T. Mobley, a former well-known telegrapher of Richmond, Va., died at Los Angeles, Cal., November 18, aged forty-seven years. He had been a resident of California for some time past.

Silas W. Rankin, superintendent of mails at Springfield, Mass., died November 8, aged fifty-six years. Before entering the government service Mr. Rankin was a telegraph operator in the employ of the Western Union Telegraph Company, working at one time in the New York main office.

Frederick Fairchild, manager of the New Haven, Conn., office of the Western Union Telegraph Company, died in that city, November 16, aged sixty-seven years. Mr. Fairchild entered the New Haven office of the Western Union at the age of fourteen as messenger boy and his whole life since that time has been spent in that office. He served for many years as chief operator and three years ago, after having several times refused offers of the position, became manager.

Edward Curry, prominently mentioned in the article on telegraph tournaments, now running in Telegraph Age, in connection with E. M. Shape, of Milwaukee, from whom he received 2,631 words in one hour in 1868, died at his home on Staten Island, November 17, aged sixty-six years. Mr. Curry had been in poor health for two years, having had a shock in 1907 from which he never recovered. He was connected in late years with the Rapid Transit Company on Staten Island, of which he was secretary and treasurer. His telegraph record was one of the extremely high ones and he was held in great esteem by all who knew him.

Alfred B. Talcott, a forty-niner of the telegraph and one of the prominent figures in telegraph circles in Washington, D. C., for the past fifty years, died November 20, aged eighty-four years. Mr. Talcott entered the service in 1849 at Boston and was soon after placed in charge of the office at No. 8 Wall Street, New York. He played an active part in the early development of the telegraph and became manager of the Washington office in 1859, resigning this position in 1862 to become correspondent for the New York Herald with the army in lower Maryland. Just before the close of the war he became superintendent of fire-alarm and police telegraphs in Washington. He left this position in 1868 to again engage in journalistic work and was connected with various Washington papers until 1882, when he was appointed electrician of the House of Representatives, which position he has since held.

William M. Laffan, editor and publisher of the New York Sun, former vice-president of the United Press, and well known in telegraph circles, died at his home in Lawrence, Long Island, November 19, aged sixty-one years. Mr. Laffan was born in Dublin, Ireland. After completing his education he came to America and obtained employment as reporter on the San Francisco Bulletin, and in a short time became managing editor. He afterward became editor of the Baltimore Daily Bulletin and subsequently full owner of that paper. In 1877 he joined the forces of the New York Sun as general writer. In 1884 he became publisher of that paper and in 1887 founded the Evening Sun. In 1900 he bought out the interest of the estate of Charles A. Dana, becoming the principal owner of the paper. In 1892 Mr. Laffan, being dissatisfied with the Associated Press service, went over to the United Press, which was at that time a much weaker organization. Within a year thereafter, through his leadership, the entire Associated Press had been won over and merged with the United Press. Within a few years, however, the Associated Press was reorganized and the United Press of that time disappearing, Mr. Laffan cut loose entirely from existing news-gathering organizations and organized a bureau of his own known as the Laffan News Bureau.

LETTERS FROM OUR AGENTS.**'FRISCO SYSTEM.**

The principal relay office on the 'Frisco System, of which Mr. H. D. Teed is superintendent of telegraph, is located at Springfield, Mo., and employs a force of about twenty-five men, all of whom must necessarily be strictly first class, as the character of the work demands the best quality of service, and just at this time of the year the volume of business is very heavy. The equipment of this office is strictly up to date, and consists of five quadruplex sets of the latest design, switchboard accommodating seventy-six wires, and other necessary apparatus adequate to equip a first-class telegraph office.

The office is in charge of Mr. A. F. Gustavson as manager and wire chief, with two able assistants, Messrs. Crump and Lamkin, second and third trick wire chiefs respectively. Mr. John Morris is in charge of the traffic department. Mr. J. F. Slack, lately with the Santa Fe system at Beaumont, Tex., is a recent arrival at the office.

TOLEDO, O., WESTERN UNION.

The many friends of Thomas H. B. Van Keuren, father of Clay Van Keuren, traffic chief of this office, will regret to learn of his death, November 5, of paralysis, aged fifty-two years.

C. A. Lytle, of Alpena, Mich., has accepted a position in this office.

Operator Clyde Knox has gone to Alpena, to remain until the close of navigation.

PHILADELPHIA, POSTAL.

Since the Rowland service has been discontinued and the old bonus system has been re-established in this office, the "bonus-fever" seems to have attacked quite a number of the operators. Some fast work is being done, and in a little while records may be broken by these men.

Among the new arrivals in this office are: J. H. Brandt, F. S. Barrett, J. H. Whitlock, F. B. Dannalls and E. C. Trumpeller.

Rebuilt Remington, Smith and Fay-Sholes typewriters, \$25 to \$35, guaranteed one year. Rentals \$2 and \$3 monthly. ALL rental applies on purchase. Rebuilding and repairing at very moderate prices. Central Typewriter Exchange, 203 Broadway, New York.

NEW YORK, WESTERN UNION.

John A. McDonald, manager of the office at 1398 Broadway, died November 21.

Mrs. Kate J. Merritt, formerly of this office, died suddenly on November 22.

Miss Mary L. Stevens, who for the past seven years has had charge of the "returned check error" branch of the Tariff and Check Bureau, died at her home in New York November 4. Miss Stevens's service for the company commenced about forty years ago. Miss Charlotte E. Dunn, to whose position as chief of the work referred to

Miss Stevens succeeded, died at her home in New York November 18. Miss Dunn's service in the Tariff and Check Bureau was continuous for nearly thirty years. To those who had to do with error sheets previous to 1900 Miss Dunn's was a familiar name. Both of these faithful assistants gave to their work the most careful and competent attention and to the company the most perfect loyalty.

B. D. Chandler, the official carpenter of the company, died November 15, aged sixty-six years. Mr. Chandler was well known in all sections of the country, having provided the carpenter and fine cabinet work for all the main offices.

Mrs. Paul Sheehan, wife of Paul Sheehan, a night chief at 195 Broadway, whose death was recorded in our November 1 issue, died at her home in Brooklyn, November 15.

OTHER NEW YORK NEWS.

Assessments Nos. 500 and 501 have been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of Edward L. Parmelee, at St. Louis, Mo.; Michael T. Quigley, at Vancouver, B. C.; Parker Price, at Pottsville, Pa.; William B. Rundle, at Denver, Col.; Thomas C. Mackenna, at Whitestone, N. Y.; James T. Nelson, at Brooklyn; William H. Armstrong, at Norwood, O.; John R. Van Wormer, at New York; William T. Geary, at Livermore, Ky., and Paul Sheehan, at Brooklyn.

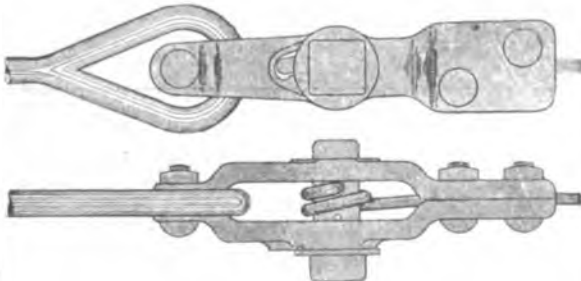
Mrs. Reynolds, wife of B. H. Reynolds, superintendent of the Central and South American Telegraph Company, who has been seriously ill for some time past, has so far recovered that all danger is past.

Mrs. L. J. Brant, wife of the late John Brant, of New York, for many years secretary of the Old Time Telegraphers' and Historical Association, who has been in Europe since last March, intends to spend the winter in Italy, being at present and for some time to come at Rome.

The Serial Building Loan and Savings Institution, 195 Broadway, New York, invites correspondence with prospective depositors who are directly or incidentally seeking the purchase of a home. Although generously sustained by telegraphers, for whom it was originally established, it should have a larger clientele among the fraternity, and asks their accounts.

DROP-FORGED COMBINATION GUY WIRE CLAMPS

A NEW POLE LINE DEVICE, AND THE BEST ON THE MARKET
NOT an experiment!
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Method of applying our Combination Clamp to anchor rod, slack readily taken up by the use of a standard wrench.



Former method of applying guy wire to anchor rod, necessitating use of block and tackle to take up slack.

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Leg Pattern \$3.50
Legless Pattern 4.00
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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.

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Columbia, Pa. - R. F. D. No. 1

NOTICE

To Managers of Telegraph Offices and Users of the Wires

On December 1 the Western Union and Postal Telegraph Companies will put into effect new rules governing the transmission of domestic messages sent in code language.

Those who have been in the habit of using mutilated words will have to exercise great caution if they desire their messages forwarded promptly and at the same time avoid complications in the settlement of their accounts with the telegraph companies.

As the Western Union and Postal Telegraph Companies have given their stamp of approval on Official Vocabulary words, those who use these words can feel absolutely safe.

The largest and most comprehensive Code in which Official Vocabulary words alone appear, employed by the most prominent corporations and firms throughout the world, is

The Western Union Telegraphic Code

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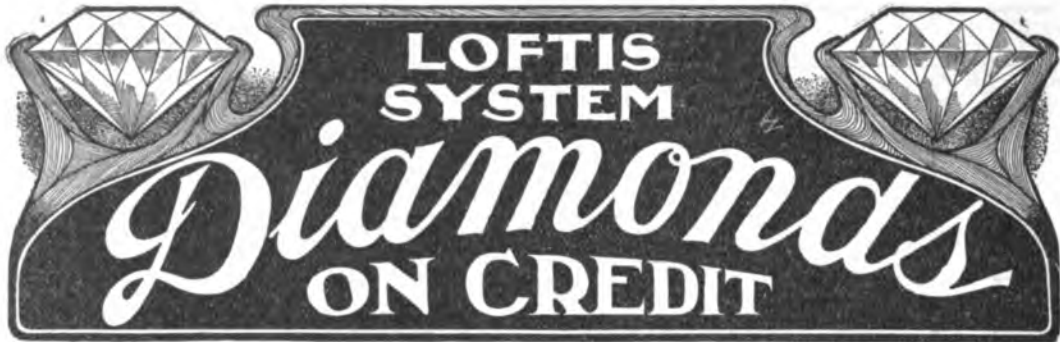
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In Gold Filled, Dust Proof Case, Warranted to Wear for 20 Years.

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The reason this cigar is sold at \$2.40 instead of \$5.00 per hundred is because I buy and sell for cash. I ask no credit, neither do I give it. I personally buy my tobacco direct from the grower in Cuba, and pay him at least five weeks before the tobacco reaches the U. S. Custom House. I buy for less and sell for less. The man who buys and sells on credit cannot compete with me. I believe in what Elbert Hubbard said in the April, 1907, issue of the "Philistine."

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Among my 35 different brands I have an "in between" smoke called "Old Fashioned Havana Smokers." I want you to be on smoking terms with them, because they are just the thing you want when you don't want a big cigar. They are Havana filled—4 in. long—blunt at both ends—made the way the Cuban planter rolls tobacco for his own use—without a binder.

I'm so eager to have you try this smoke that I'll send you a sample box of 12 free, along with an order for my Panatelas, because you'll buy them again.

Send me \$2.40 for 100 Morton R. Edwin Panatelas. Smoke as many as you like—smoke them all if you want to, and if you then tell me that you didn't receive more than you expected I'll return your money and we'll remain friends.

If you want to know who I am and whether or not I run my business on the square, if you have any doubts as to my making good if my cigars don't, just inquire from any bank or commercial agency about me. If you don't like the report you get, keep your cash at home.



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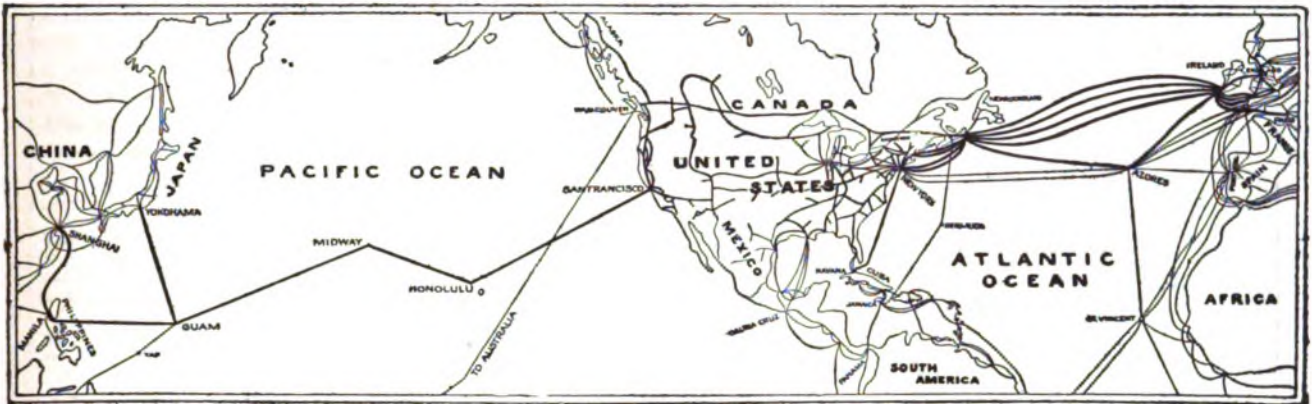
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SPEAKS FOR ITSELF:

..... Supt.,
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Very truly yours,

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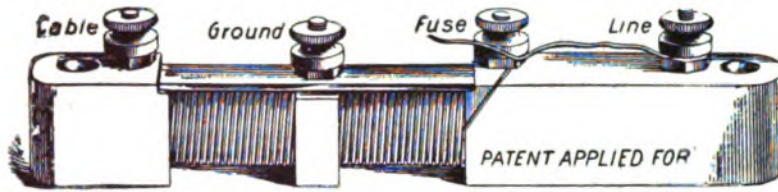
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No Carbons to Clean
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But Ready Just the
Same for the Next
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Lightning of any degree interrupted without grounding or disabling the line. Thousands in use last season. Not one case of loss of Instruments or Cables protected by THE ARGUS ARRESTER.

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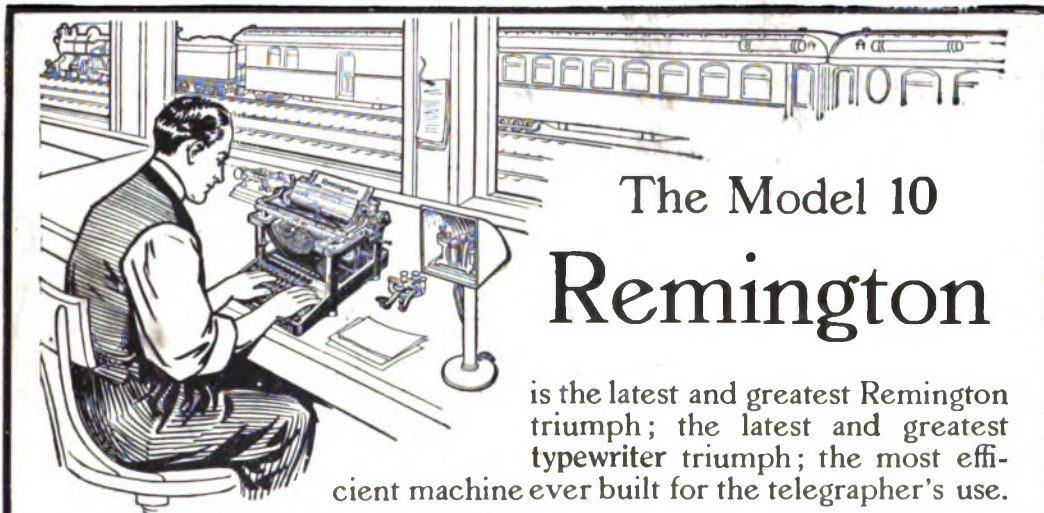
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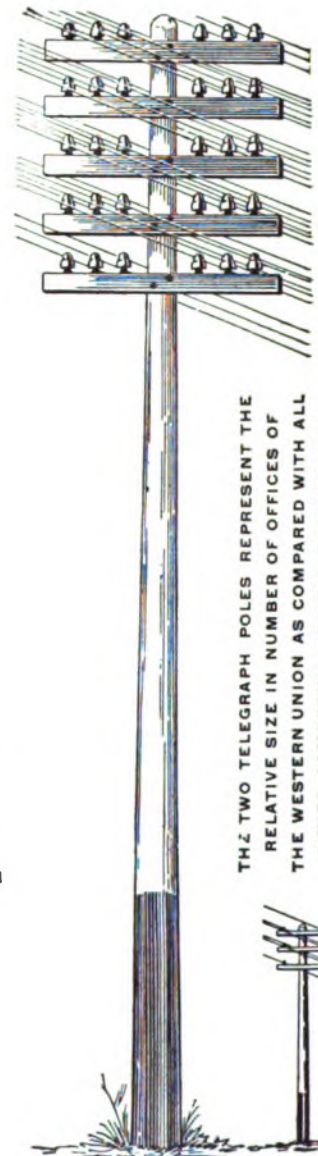
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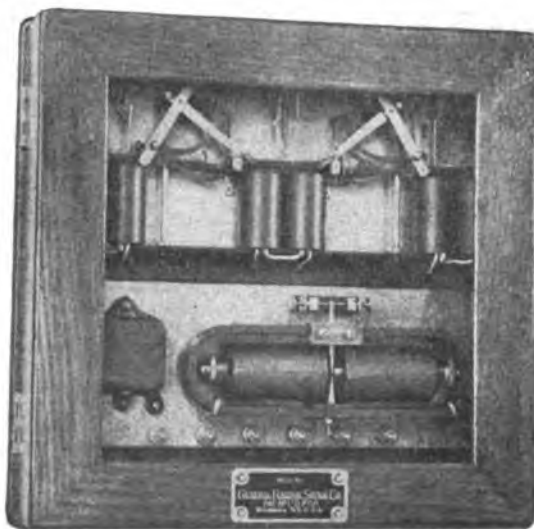
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Many expert code operators have examined the revised edition of this code, and all unite in pronouncing it perfect. Mr. George W. Conkling, who has won the championship for sending code in many tournaments, says:

"I have examined thoroughly the additions contained in the latest edition of the Phillips Code and most heartily approve of them. Every operator who is familiar with the code should find no difficulty in mastering the new contractions, as they 'fit in' smoothly and I think the ground has been entirely covered." The price of the book is \$1 per copy.

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

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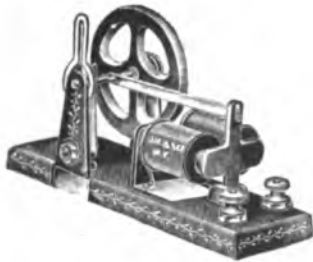
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TELEGRAPH AGE

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Twenty-Sixth Year.

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

Electric Heaters, Electric Welding and Fuse Wires.

There is no electric apparatus or industry so simple but that there are probably many persons who are almost entirely ignorant of the general principles involved in its operation. To such persons an elementary explanation of the basic principles employed in some well-known electric devices may prove interesting.

ELECTRIC HEATERS.

One of the well established laws in connection with an electric current is that in its passage through a conductor it develops heat therein in accordance to the strength of the current in amperes, the length of time it continues to flow, and the resistance of the wire or conductor conveying it.

Some metals rise to a higher temperature than others with a given volume of current passing through them, hence the first thing to do in collecting material for heating apparatus is to select some refractory metal that possesses this heating property in a high degree and construct the coils or other heat receptacle with the same.

German silver wire has been found very suitable material for this purpose, as it possesses a very high resistance, may be heated to a high temperature without melting, and radiates its heat readily to the surrounding atmosphere.

Every operator has noticed that a relay becomes rather warm on very wet days when the current is stronger than usual, and also when a wire becomes grounded nearby. But the copper wires in relays can carry a fairly strong current without becoming dangerously overheated.

If the same volume of current flowed through a like coil composed of German silver wire, the coil would become so hot in a very few minutes that it could not be touched without burning the hand. Chief operators at the switch board all know that the 500, 1,000, 2,000, etc., ohm resistance wedges used in main line circuits to reduce the volume of current soon become very hot after being inserted in the line.

The heating apparatus for a trolley car, in most systems, therefore, consists of nothing more than a number of coils of bare German silver wire, so wound around some non-inflammable material as to permit free radiation of heat from each convolution of wire and the same encased in a protecting box, usually located immediately under the seat. It is claimed that the average cost of heating an ordinary trolley car is less than three cents per hour, and as the heater occupies no passenger space it is the cheapest method of heating known.

Electric cooking apparatus, soldering irons and other household utensils are all operated by the heating effect of the current in a similar manner, the only difference being in the respective construction of each type for a particular purpose.

ELECTRIC WELDING.

Electric welding differs from the process of joining two bars or pieces of metal together by means of soldering, inasmuch as when the operation is done by the welding method the finished joint is no longer a joint in the sense of being a point of connection for the reason that the two bars then become one homogenous mass at the joint in the same manner that two separate streams of water become one and the same body after they are caused to meet and mingle together.

This statement suggests the actual principle involved in the operation, viz: heat the two ends of the wire or bar to the required temperature, by means of a very strong electric current, usually to about the melting point, press them together and allow the softened parts to flow into each other and thus mingle as a whole. After the parts have cooled off the point of connection, if the operation is properly carried out, can barely be detected.

One of the requirements for insuring a perfect weld is a uniform temperature throughout the

mass of the parts to be joined. For this reason an alternating current is not only preferable to a direct current, but is most generally employed for electric welding. The choice is partly due to the fact that the "skin effect," as it is called, or the tendency of an alternating current to become more dense at the surface than in the center of a metal conductor, suffices to keep the surface metal where radiation is greatest, at about the same temperature as that in the interior portions where such losses are, of course, a minimum. Otherwise a direct current would be equally as efficient, as the heat evolved with a given current would be practically the same in either case.

FUSES.

The ease with which great masses of metal are softened by electricity and welded together conclusively demonstrates the fact that no telegraph wire, however large in diameter is absolutely immune from the harmful effects of an excessive volume of current. There is a point in every conductor beyond which the temperature must not be permitted to rise. Bare wires, of course, will stand more current than covered conductors, for the reason that the silk, cotton or other coating is more perishable.

For the purpose of protecting such wires, and particularly the dynamo and apparatus connected therewith we employ a device called a fuse. There are many different kinds of fuses, but the principle of operation is the same in all types.

A fuse usually consists of a short length of wire, generally but two or three inches long, composed of an alloy of lead and tin. This composition can be made in such proportions, length, and thickness, that it will melt at any given degree of temperature required when an excessive volume of current flows through it for a given number of seconds or minutes as the case may require.

Hence the fuse is placed directly in the circuit and becomes part of the conductor. When the break occurs the attendants know exactly where to find it and replace the fuse after the dangerous current has subsided.

On account of the electric arc that forms across the gap when the fuse melts and thus breaks the circuit, unprotected inflammable material in its immediate vicinity is liable to catch fire. For this reason various means of remedying this fault are resorted to. In most cases the fuses are simply encased in porcelain boxes, while in other later types the wire is run through tubes containing a powder which quickly smothers the arc.

The importance of fuses may be surmised from the fact that the insurance laws demanding and regulating their use are very strict and specific in their wording.

Recent Telegraph and Telephone Patents.

A patent, No. 940,140, for a telephone call recording device, has been awarded to George R. Fawkes, of Waterloo, Iowa.

A patent, No. 940,654, for the art of nullifying inductive disturbances, has been granted to William E. Athearn, of New York. The method of arranging for communication, lines employed in inducing neutralizing electromotive-forces in other lines of communication, consists in rendering each of the neutralizing lines electrically continuous independently of its associated neutralizing lines, and providing for the inducing currents a path separate from the neutralizing lines, such path excluding operating currents.

A patent, No. 940,655, for an electrical conducting system has been taken out by William E. Athearn, of New York. The system comprises groups of lines, an induction coil having a primary winding connected to the lines of one group and secondary windings joined to the lines of a second group, and means for preserving the electrical continuity of each line of the primary group independently of the associated lines.

A patent, No. 940,658, for a system for nullifying inductive disturbances has been secured by John A. Barrett, of New York. Signaling conductors are arranged in groups each comprising a number of conductors, and an induction coil having primary and secondary windings is included in different groups and continues the circuit of each conductor independently of the associated conductors.

A patent, No. 940,693, for a telephone system has been issued to David S. Hulfish, of Chicago, Ill.

A patent, No. 940,746, for a telephone system has been awarded to Henry B. Stone, of Providence, R. I.

A patent, No. 940,994, for a telephone system has been secured by John N. Wallace, of La Crosse, Wis.

A patent, No. 941,086, for a telephone attachment has been granted to Charles B. Mitchell, of Franklin, Tex.

A patent, No. 941,336, for a telephone cabinet has been issued to Charles E. Oxford, of Fayetteville, Ark.

A patent, No. 941,666, for a telephone system has been taken out by Harry G. Webster, of Chicago, Ill.

A patent, No. 941,700, for a relay has been granted to T. W. Gleeson, of Boston, Mass. Electromagnetic relays for telegraphs in which a magnetically inductive armature has pole pieces and a permanent magnet has one of its poles next to the armature and the other pole separated therefrom with a soft iron member between the magnet and the distant pole.

A patent, No. 941,743, for a telephone-line selective switch device has been awarded to John H. Swanson, of Baldwin, Wis.

A patent, No. 941,762, for a desk telephone has been issued to Elmer R. Corwin and Charles A. Bals, of Chicago, Ill.

Changes in Western Union Directorate.

At the quarterly meeting of the Board of Directors of the Western Union Telegraph Company, held December 8, the following directors tendered their resignations:

Frank Jay Gould, Howard Gould, Kingdon Gould, John T. Terry, C. Sidney Shepard, G. W. E. Atkins, Thomas F. Clark, John B. Van Every, William L. Bull, and Alvin W. Krech.

These vacancies were then filled by the election of Theo. N. Vail, Edward J. Hall, Henry S. Howe, John I. Waterbury, Robert Winsor, Henry P. Davison, William H. Moore, Robert S. Lovett, Union N. Bethell, and Harry B. Thayer.

The executive committee elected is composed of R. C. Clowry, Theodore N. Vail, Edward J. Hall, Harry A. Bishop, Thomas H. Hubbard, Jos. J. Slocum, Jacob H. Schiff, Union N. Bethell and Harris C. Fahnstock.

A quarterly dividend of three-quarters of one per cent. was declared, payable January 15, to stockholders of record on December 20.

The following statement shows the condition of the company at the close of the quarter ended September 30, 1909:

Surplus July 1, 1909.....	\$17,269,277.83	
Net revenue, quarter ending Sept. 30, 1909.....	1,929,275.53	
		\$19,198,553.36
Dividend of $\frac{3}{4}$ per cent., paid		
Oct. 15, 1909.....	\$747,492.00	
Interest on bonded debt.....	433,062.50	1,180,554.50
Surplus Sept. 30, 1909.....	\$18,017,998.86	

The following statement shows the estimated condition of the company at the close of the quarter ending December 31, 1909:

Surplus Sept. 30, 1909, as above.....	\$18,017,998.86	
The net revenues of the quarter ending Dec. 31, based upon nearly completed returns for October, partial returns for November, and estimating the business for December, will be about....	\$2,000,000.00	
Less interest on bonded debt.....	433,062.50	
Leaves estimated net earnings for the quarter, less interest on bonded debt.....	1,566,937.50	
		\$19,584,936.36

The directorate as now made up is looked upon in financial circles as an exceptionally strong one. Of the new directors, Henry P. Davison is a member of the firm of J. P. Morgan and Company; Robert Winsor represents the Boston banking firm of Lee, Higginson and Company; Robert S. Lovett is Edward H. Harriman's successor in the direction of his railroad properties; William H. Moore is a member of the banking firm of Moore Brothers, Chicago, and of the Rock Island syndicate; Theodore N. Vail is president of the American Telephone and Telegraph Company; Edward J. Hall is a vice-president of the American Telephone and Telegraph Company; Union N. Bethell is president of the New York Telephone Company; Harry B. Thayer is president

of the Western Electric Company, and a vice-president of the American Telephone and Telegraph Company; Henry S. Howe is a director of the American Telephone and Telegraph Company, and of several large financial concerns; John I. Waterbury is president of the Manhattan Trust Company of New York.

Investigation of Telephone and Telegraph Companies in New York.

The special committee appointed by the New York State Legislature to investigate telegraph and telephone conditions in the State, to determine whether they should be placed under the supervision of the Public Service Commission has been holding sessions in New York since December 1, looking into the existing situation in the greater city and vicinity. Part of the time of the committee has been spent in listening to complaints against the telephone and telegraph companies, and in hearing the testimony of various promoters of independent telephone companies who have in the past sought to gain entrance into New York city. Officials of the Postal Telegraph-Cable Company have also been examined to give details of the organization of their company. The so-called telephone and telegraph merger has also received attention. Theodore N. Vail, president of the American Telephone and Telegraph Company, was questioned by the committee on December 9, and gave details of the negotiations which resulted in his company obtaining possession of \$30,000,000 out of \$100,000,000 capital stock of the Western Union Telegraph Company. He intimated that the reason for getting an interest in the Western Union was to build up a national system of combined telephony and telegraphy, which in time will enable a patron of the telephone company to sit at home and send a message by telegraph to any part of the United States or Canada without the delay of sending for a messenger boy, or having the message delivered by messenger at the other end. He also gave the committee of legislators a history of the telephone business, from its inception of the present, and explained the operation of the system which to-day threads the entire country with telephone lines.

Mr. Vail said that two such companies working together could be of great benefit to the public in many ways. In the first place, he said, when a telephone company operates a telegraph system it is a simple matter to build up a system so that messages can be started by telephone and relayed by telegraph to near the point of destination, then taken up and continued by telephone. He said that the trouble in telegraphing without the adjunct of the telephone is the delay in getting a message to the telegraph office and from the telegraph office to its destination.

"Such a combined system can be built up to a very great extent, making a nearly instantaneous system," said Mr. Vail. "Some day there will be

an international system which will be a standard form of service."

Upon being asked if he considered that a monopoly gives the best telephone service in any community, Mr. Vail said that he did, and that no one had any objection to a proper supervision by the State of the affairs of the telephone and telegraph. In answer to the question as to whether he thought they should be regulated as to the quality and character of the service rendered, Mr. Vail said:

"If a company does not have enough interest in its own affairs to give the sort of service that is desired it would not need regulating very long."

In reciting the history of the telephone business, Mr. Vail told how the telephone was first discovered by Alexander Graham Bell, and how Dom Pedro, Emperor of Brazil, happened to be instrumental in the development of it. Prof. Bell had just perfected the "talking telegraph," and had it on exhibition at the Philadelphia Centennial Exposition. A committee, of which the Brazilian Emperor was a member, was about to pass the "talking telegraph" by when Dom Pedro became interested and insisted on the committee giving the invention close attention.

This brought the telephone to the public's notice and its development began immediately. Mr. Vail said that the American Telephone and Telegraph Company had gradually absorbed the other companies and built up a system reaching throughout the country. The company of to-day is an evolution of the old New England Company organized in 1876 and 1877.

Personal.

C. N. Marinos has been appointed director-general of the Grecian Posts and Telegraphs.

Senor Francois Rodrigues has been appointed director-general of the Spanish Posts and Telegraphs.

Mr. H. H. Matlock a well known old time telegrapher of Springfield, Illinois, has gone to San Antonio, Texas, where he will spend the winter with his family.

Mr. C. Friedlander, division supervisor of leased wires of the American Telephone and Telegraph Company at Chicago, was a recent New York visitor.

Mr. H. G. Martin, inventor of the Vibroplex and a well known telegrapher, who for the past three years has been in the manufacturing business in Georgia, is now in New York.

Mr. Thomas F. Clohesy an old time telegrapher, formerly of Toledo, Ohio and at one time telegraph manager at Kansas City, Missouri and St. Louis is now located at 90 West Street, New York, as eastern manager for the Blaisdell Machinery Company, manufacturers of vacuum cleaning equipment.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Mr. T. W. Goulding, European general manager, sailed for England December 4 on the steamer "Baltic."

Barclay printing equipment has recently been installed upon circuits between the following points: Philadelphia and Cincinnati, Louisville and Nashville, Pittsburg and Cincinnati and Omaha and St. Paul.

An agreement has been made with the British Post Office authorities through which this company will be enabled to make cable transfers of money between its offices in the United States and points in Great Britain and Ireland where the orders will be cashed by the postal department. The new arrangement becomes effective January 1.

RESIGNATIONS AND APPOINTMENTS.

Mrs. Anna L. Dickinson, has been appointed manager at Charleroi, Pa., vice J. S. Chamberlin resigned.

Mr. R. H. Little has been appointed manager at Scottdale, Pa., vice Mr. Harry Boord resigned.

Mr. Simon E. Lonergan, chief operator of the New Haven office has been appointed manager, vice Frederick Fairchild deceased. Mrs. W. E. Ufford succeeds him as chief operator. Both of these promotions are well earned and merited. Mr. Lonergan entered the telegraph service in 1884 as a messenger boy and has been employed in the New Haven office ever since with the exception of one year when he worked in the New York main office. Mrs. Ufford has been in the service for the past ten years and is regarded as one of the best woman operators in New England.

Postal Telegraph Cable Company.

EXECUTIVE OFFICES.

Mr. H. G. Haddon, general manager of the Martha's Vineyard Telegraph Company, Wood's Hole, Mass., was a recent executive office visitor while en route to the South on a vacation.

Mr. L. Lemon, division superintendent, has returned to his office after relieving Mr. H. Scrivens, superintendent at Pittsburg, who has been absent on a vacation.

Mr. Charles P. Bruch, third vice-president of the company, spent several days recently inspecting the property of the company in Philadelphia.

A handsome new branch office has been established on Seventy-third Street, New York, between Park and Lexington avenues. In point of equipment it is as beautiful as any in the country.

A new line is being constructed from Knoxville, Tenn., through Asheville to Spartansburg, N. C. This will add several new offices to the system.

The Reno, Nev., office of this company was opened for public business on December 1.

Mr. Donald McNicol, who until two months ago was manager of the Salt Lake City office, has joined the staff of the electrical engineer's office in New York.

A Wright printing telegraph circuit has been established between New York and Boston and is rendering satisfactory service.

An automobile repair wagon has been constructed to meet the special requirements of the telegraph and is now giving good service in the mountains of Pennsylvania between Pittsburg and Baltimore. Motorcycles are also being introduced among the linemen, the use of which enables them to effect speedy repairs of interruptions.

Mr. J. J. Lynch has been appointed superintendent of construction of the Pacific Division, with headquarters at San Francisco, Cal. Mr. Lynch entered the telegraph service in 1887 with the Santa Fe system. The following year he entered the employ of this company as lineman and has steadily advanced through the various grades to his present position.

A cable was recently shipped from New York to Oakland, Cal., where it will be laid to connect that city with San Francisco across the bay, a distance of over four miles. The cable is two and one-half inches in diameter and weighs ten pounds per foot, one section alone forty-two hundred feet in length weighing twenty-one tons. The insulation is of paper with lead sheathing outside of which is an armor consisting of No. 4 British wire gauge iron wires.

The Cable.

The agreement between the Government of the Dominion of Canada and the Anglo-American Telegraph Company, granting to that company the exclusive franchise for Prince Edward Island, Canada, made in 1904, to remain in force for five years, under which the telegraph company received a subsidy of \$5,000 annually from the Dominion, and in addition thereto the sum of \$1,800 under a law of the Province, has expired recently and it is said that its renewal in favor of the Anglo-American Company is doubtful.

James Nicolson, formerly superintendent of the Western Telegraph Company at Buenos Ayres, Argentine, died at Berlin, Germany, October 27.

Mr. Nicolson who had been many years in the Western Company's service, was retired last year and went to Berlin to reside. He was the inventor of a system of telegraph signals and international code vocabulary and the compilation of this book was his hobby for many years. The signals were adopted by the British Admiralty for use in the navy in 1906 after a lengthy trial in connection with wireless telegraphy. Mr. Nicolson was well known to many in New York interested in the cable service.

Repairs upon the cable of the Direct West India Cable Company between Bermuda and Jamaica which was interrupted during the severe storm which swept the West Indies November 7, were completed by the Central and South American Telegraph Company's cable repair steamer "Relay" November 29.

Municipal Electricians.

A new storage battery system and switchboard for the fire alarm system is being installed at Nevada City, Cal.

Miss Florence Gertrude Bosch, daughter of Adam Bosch, superintendent of fire alarm and police telegraphs, Newark, N. J., was married November 29 to Mr. E. I. Rogers, of Richmond Hill, Long Island.

Among the cities and towns considering the installation of electric fire alarm systems are Kenmore, N. Y., Illion, N. Y., Galesburg, Ill., Santa Cruz, Cal., and Dodge City, Kan.

A contract has been awarded at Springfield, Mass., to the Gamewell Fire Alarm Telegraph Company for the installation of new fire alarm apparatus at a cost of \$30,000.

Mr. B. E. Blanchard, chief electrical inspector of the Chicago Board of Underwriters, in the sixth and last of a series of lectures, based upon the National Electrical Code, delivered before the Fire Insurance Club of Chicago, on November 23, devoted considerable attention to moving picture machines, thermostats, inspectors' supervision of automatic sprinklers, valve alarms and journal alarms. Mr. Blanchard said that during the past five years he has only known of two fires in moving picture theatres which extended beyond the booth in which the machine was operated, thus showing the wisdom of requiring the booth to be made of fire-proof construction.

Canadian Pacific Railway's Telegraph.

One of the most disastrous storms to the telegraph which ever visited Canada occurred along the main line of the Canadian Pacific Railway Company's telegraph in the vicinity of Ottawa, November 22. On that day a sleet and wind storm together broke down many of the poles and wires, and two days later a fifty-mile-an-hour gale came along and finished the work, so that for miles at a stretch there was not a single pole left standing. In all over 2,250 poles were broken down and nearly one hundred miles of line was completely destroyed. In some cases the poles carried twenty or more telegraph and telephone wires, all of which were broken so as to be practically useless for reconstruction purposes. The task of rebuilding one hundred miles of line was a difficult one, but communication between the various points was entirely restored within a week. While the wires were down commercial messages were sent from Montreal to Toronto via Utica and Buffalo.

Telegraph and Telephone Systems as Affected by Alternating Current Lines.

At the first fall meeting of the Boston section of the American Institute of Electrical Engineers held in that city, Mr. John B. Taylor read his paper upon "Telegraph and Telephone Systems as Affected by Alternating Current Lines," which he presented at the October meeting of the Institute in New York, and an abstract of which appeared in our October 16 and November 16 issues.

Chairman Dugald C. Jackson introduced the discussion by emphasizing the necessity for co-operation between the various interests concerned in line troubles and called upon Prof. Albert S. Richey, of the Worcester Polytechnic Institute, to give his experience with telephone lines paralleling high-tension circuits. Professor Richey stated that his experience had been from the standpoint of the direct-current railway operator in the Central States. The railway lines he had in charge were supplied with direct-current power, the telephone wires being on one side of the track and the feeders on the other. These telephone lines were transposed about every half mile, and jack boxes were installed every quarter mile for the use of the car-service men. These were simple wooden boxes, with the bottom and part of the front entirely open to the air. The connections for the telephone leads were on the back of the box, with two brass binding posts for the terminals. This construction in itself made a fair ground on the telephone service every quarter mile, but as the ground was the same on each wire, the circuit was well balanced and the results were good. When high-tension work began the line potential was 16,000 volts, paralleling almost 100 miles of the telephone service. The transmission wires were carried on the tops of 40-foot poles, with the telephone lines on the opposite side of the track. The service remained good, and later, in building another 125 miles of transmission line for 30,000-volt service, the telephone lines were installed in two sets on arms ten feet below the power wires. The telephone line was transposed every sixteen poles for convenience in further subdivision of the transposition if necessary. Little trouble was experienced. The transpositions were regular, the lines well balanced and the telephone wires were near the ground electrically by their location close to the direct-current feeders. Trouble occurred whenever there were bad connections in the line wires, which unbalanced the lines. Great care was taken to have the linemen make good connections in the telephone circuits and the company substituted for the old-fashioned transposition with two transposition glasses and from four to six joints in the line wire, a transposition with a single glass, which introduced no additional joints in the line wire. This was a decided help. If the transmission service was in trouble, the telephone lines felt it. Professor Richey closed with the

statement that in the case cited the telephone and the railway companies have common interests and are equally concerned with establishing and maintaining good service.

Mr. Sewall Cabot, of the Stone Telephone and Telegraph Company, Boston, referred to the system of metallic-circuit telephone lines mentioned by the author, in which the first three lines are on a series basis and the remaining three on a multiple basis. He pointed out that in order to work such lines as this in connection with a railway system, going outward from a large city, it would be necessary to use repeater stations at both ends of the lines in order to connect them with other telegraph lines, and this would interfere with telegraph work because it is impossible to attach a grounded line to a metallic line without a repeater. In the multiple system the tendency would be for the action of the relays to be sluggish. He understood that there are two ways of remedying interference with the ordinary grounded telegraph service. One is by means of the neutralizing wire with the compensating transformer for both current and potential, and the other by making what amounts to a three-wire trolley system. If a three-wire, single-phase system with the out-track of one polarity and the in-track of the other polarity were installed, and then those trolleys exchanged between track and track, this might be a virtual means of transposing the power system so that it would not cause disturbance with the telegraph and possibly not with telephone lines.

Mr. C. D. Jarvis, of the New England Telephone and Telegraph Company, stated that there is more difficulty in maintaining telephonic balances with the cables and apparatus than with the open wiring. Cables are made as well as they can be to obtain a very close balance, but even with the twisted pairs there is sometimes considerable difficulty in balancing for telephonic currents, especially where the so-called phantom circuit is provided, and which is operated over two telephone circuits. On a telephone circuit for ordinary commercial use it is not possible to impose upon it indifferent potentials higher than those common to telephone work, if good results are to be obtained. There is a great difference between local and toll practice in this respect. On the company's long toll lines, in order to meet the conditions of the public and increase the range of transmission, it is necessary not only to employ open wires but also to minimize the effect of capacity on this open construction by loading. These open wires are exposed to the field surrounding railway and power circuits, and there is no way of escaping them; but in the local distribution the company can use large numbers of conductors covered with a common lead sheath, which screens the conductors at least from any ordinary power circuit. In case of single-phase railway operation, the company is having trouble with the cables. The sheath is not effective as a

screen in that case. On some of the New York lines a neutralizing transformer has been adopted. One of the open wires exposed to the New Haven electrification is damaged so much that the company has lost the open-wire efficiency entirely and might as well have cable to replace the open wires. Experience in telephone long-distance work in New England indicates that it will be necessary for the company to keep entirely away from electric light circuits. It is a question whether the company will be able to operate telephone lines on the same highway with power circuits. It is at present operating toll circuits in some cases for ten miles parallel to power lines. Disturbances have not been entirely eliminated, although the telephone company is on the opposite side of the road. It has suffered repeatedly when there have been defects on the power system, the whole system often being at a standstill for several hours. In one case, where the two services parallel for five miles, the telephone lines have in the past year been thrown out of operation for three or four hours at a time. In this case the power circuit had a potential of 33,000 volts with a grounded neutral, and the induced current in the telephone lines was large enough to operate the arresters. It is not unlikely that the presence of power and lighting wires will ultimately drive the telephone company off the highways.

Mr. Taylor closed the discussion by stating that a comparison of notes and a discussion of the conditions by the different interests will often permit the settlement of troubles at small cost. A direct-current trolley wire may give some trouble as a result of commutated current at the motors and generators. A submarine cable carried overland down toward Coney Island gave troubles which were hard to account for, and the difficulty was finally tracked down to a point where the overhead wire ran close to the overhead trolley, the latter having a defective ear, which sparked badly with each passing car. Unbalancing of joints is as important as anything else. If a transposition is used in a form which causes joints, there may be more trouble than one would have without the transposition. A form of transposition where the wires do not have to be cut is desirable. He agreed with Mr. Cabot's criticisms. The multiple telegraph has not had a fair and commercial trial over a line of any length, and if attempted, the relays will have to be different or more carefully adjusted than the present types. The three-wire trolley plan is at present merely a paper scheme.

In addition to the discussion following the presentation of Mr. Taylor's paper, which we summarized in our November 16 issue, Mr. J. C. Barclay, electrical engineer of the Western Union Telegraph Company, New York, contributed by letter the following statement in regard to the operation of the telegraph lines along the electrified portion of the New York, New Haven and Hartford Railroad:

Mr. Murray has made an assertion to the effect that there is no interference with the telegraph service due to the operation of the single-phase system on the New York, New Haven and Hartford Railroad. This is far from being correct. It is true that by means of the neutralizing transformers interposed in the telegraph circuits at two-mile intervals along the electrified zone, the working of the wires has been rendered more or less feasible, where otherwise complete demoralization of the service would have undoubtedly resulted from the disturbances induced therein; but the impression sought to be conveyed that these transformers have proved a panacea for all the inductive ills to which the wires are subjected, is not at all justified by the facts in the case.

There are various reasons why the neutralizing apparatus is not entirely effective under the present conditions of installation. In the first place, escaping currents from direct-current trolley systems find access to the primary windings of the transformers, the cores of which become magnetized, and diminish the degree of neutralization that might otherwise be secured. The working currents of the telegraph circuits in passing through the secondary windings also excite in the transformer cores an amount of magnetism that varies in proportion to the number of telegraph keys that happen to be opened or closed, with corresponding variations in the neutralizing values. And, on account of phase-distortion, the counteracting electromotive forces developed by the action of the transformers are not directed in a manner to bring about complete nullification, even though the magnitude of the nullifying forces could be made equal to that of the disturbing forces.

As a result of such conditions, residual voltages and currents of varying intensity are ever present in the telegraph wires, the detrimental effects of which depend, more or less, upon the length and character of the circuit, and the strength of the working current; but are mostly manifest under unfavorable climatic conditions when the sensibility of the receiving apparatus to such currents is at a maximum.

Tests have shown that these residual or superposed electromotive forces in the wires possess an average pressure of about fifteen volts even under normal operating conditions, and although the legibility of the received signals on the regular Morse apparatus may not, as a rule, be perceptibly impaired thereby, there is, nevertheless, a marked depreciation in their character or quality that tends materially to affect the efficiency of the service; for, to quote Mr. Taylor in the paper referred to: "Disturbances on the line which do not actually upset the working, may make considerable difference in the comfort or state of mind in which the operator does his work."

From what has been said with regard to the effects observed on the comparatively insensible Morse apparatus, it naturally follows that the

more delicate instruments employed in high-speed and multiplex systems feel more acutely the influence of the disquieting currents; and it may be stated as a matter of fact that such systems can only be operated over wires extending through the electrified zone at a considerable sacrifice of speed and efficiency under the most favorable conditions, and not at all under abnormal conditions of working.

There is no disposition on the part of the writer to be hypercritical in regard to this matter, but as the result of practical experience the fact cannot be too strongly stated and emphasized—that the costly and cumbersome transforming devices, which, in addition to other disadvantages, necessitated the sacrifice of three copper wires to provide a neutralizing circuit, as well as the complete transposition of all the telegraph wires at each of the ten transforming stations along the affected zone, have not brought about a condition in the working of the wires that can in any way be regarded as satisfactory from a telegraph point of view.

The Equipment and Operation of the Signal Corps

To construct a practicable and serviceable telegraph line as fast as a horse can run would seem to most people to be an impossibility, but Company D, United States Signal Corps, stationed at Fort Omaha, has demonstrated the possibility and practicability of such a feat and has proved beyond a doubt that it can lay and pick up telegraph lines as fast as cavalry or any other branch of the army can move.

The military telegraph has become so firmly established and has assumed a position of such importance in the matter of army equipment, for tactical and strategical purposes, that without it, modern military operations could not be attempted, and so it has become one of the greatest problems in the armies of the world.

As a means of solving this question the United States Government organized four "field" companies in different parts of the country and let the captain of each develop his company according to his own ideas and tactics along certain well defined lines. The company which has reached a higher plane along this line of work than perhaps any other is Company D, commanded by Captain Oury.

For a number of years the electrical equipment of the United States Signal Corps has been of the highest type which it is possible to obtain, but, as is the case in this branch of the military service throughout the world, it has been in the mechanical part of the apparatus that the present day Signal Corps equipment has been deficient. Company D has done more in some ways to overcome this deficiency than perhaps any other organization in the corps during the limited time it has been organized. Realizing the high grade of efficiency that the electrical department of this

branch of the service has attained, and the urgent need of some adequate means of handling the wire, Captain Oury turned his attention to the improvement of the mechanical part of the equipment, with the result that he and his company have made some improvements in the last year upon the devices for laying field telegraph and telephone lines that, if adopted, will become invaluable to the army.

The greatest improvement which has been made has been upon the automatic cart for laying and picking up the wire. The cart in use at present by the four field companies now in existence is constructed along the lines of a piece of field artillery in point of strength and durability. The main feature of this cart is a large drum or reel which is suspended in such a way that it revolves freely.

Captain Oury and the men of Company D have designed a new cart, however, which is very different in many respects from the present type. The present cart has but one drum, while the new one will have two. Having two drums is a marked improvement, for, while it reduces the carrying capacity of the cart from nine miles of wire to eight, it very materially decreases the weight and tension of the drum in laying wire.

When the order is given to lay a line from one point to another, two men, an operator and a messenger, hold the end of the wire and the cart starts off at a walk, trot or gallop, as the needs of haste may require. Each cart carries a crew of two men and is escorted by six horsemen, two of whom are furnished with short lances with hooks on the end so that they may handle the wire upon the ground, in case it gets caught, without dismounting. As soon as the destination is reached, the operator on the cart may connect his instrument at any point along the line which the commanding officer may designate. As there are six carts in the company, the commanders of the various elements of an army division may be in communication with headquarters at all times.

The cart is furnished with a set of sprockets and chains, so that when the line is no longer needed at that point, the drum on the cart may be made to revolve as the cart moves and by driving back over the line, the wire may be again wound around the reel and may be ready for use in laying another line. The sprockets are so adjusted that the wire is picked up just a trifle faster than the cart moves, in this way eliminating any chance of it looping up behind and catching on a snag. In case the wire becomes too taut, the drum may be stopped for a short time and the wire allowed to become a little slack again. This may be done very gradually so that there will be little or no jerking or danger of breaking the wire. The wire may be picked up at any speed from a walk to a dead run and over any kind of ground.

The wire used is really a "cable." It is composed of eleven strands, the inner one being of

copper and the outer ones of steel. This composition gives it the highest degree of strength and flexibility, so that it may even be tied in knots without danger of breaking. It is covered with a rubber insulation, which reduces the chances of trouble from wet ground or foliage to the minimum.

The instrument used to receive the message is almost, if not quite, identical with the telephone receiver. It was very thoroughly demonstrated during the Civil War that the old style sounder which is now used in all commercial telegraph offices is too cumbersome and requires altogether too much current to operate it, to be practical in military telegraphy. In 1881 the modern "buzzer" was introduced into England, not exactly as it is to-day, but constructed fundamentally upon the same principles. It was not, however, used extensively in the English army until the United States Signal Corps developed it into a valuable military device. The buzzer works with a diaphragm instead of an armature and so is much more sensitive to the slightest electrical impulse than the old sounder. This eradicates the need of carrying so many batteries upon the field, which was the cause of so much trouble and worry to the military telegraphers of the last fifty years.

Before the introduction of the automatic cart and buzzer, it was necessary for the military telegrapher to build his line off the ground. This was done by means of lances about six feet in length, which were stuck into the earth, and the wire slipped into small notches in the upper end. This aerial line was made necessary because of the poorly insulated wire used and the care required that the wire might carry enough current to operate the heavily constructed relays and sounders then used. This was the cause of some embarrassment even in dry weather, but in wet weather or even in the case of a very heavy dew, this trouble became very serious, and it was only with much work, worry and great play of imagination that a few disconnected and fragmentary messages could be sent to satisfy the frantic appeals of the officers.

But the days of the many long trains of wagons loaded with lances, wire, batteries and other equipment are past. The distinct and inestimable advantage which the modern buzzer has over the old sounder is that it requires infinitely less current to operate it, is much smaller and lighter, and has the simplest of adjustment. Where the old Morse sounder requires many large, heavy liquid batteries, the buzzer may be operated with a few dry cells. The principal advantageous characteristic of the buzzer, however, and the one from which these others are merely resultant, is the extreme delicacy of the instrument and its acute sensitiveness to the slightest electrical impulse. It is a well known fact that there have been many instances when the buzzer has been operated over a broken wire, the ends of which were lying upon wet ground at a

distance of from a few feet to forty feet apart. So that in case the wire is laid bare, or even broken, it will not mean a suspension of operation, as the only influence from a loss of current is that the buzzing sound in the buzzer, in response to the pressure of the sender's key and from which the instrument gets its name, will become fainter.

While the greatest improvement made by Company D has been upon the cart, improvement has also been made upon this and other parts of the equipment. Heretofore it has been necessary to connect separate cords to the buzzer and batteries before the connection with the main line could be made, but this company uses a double cord, which is attached to the instrument all the time, and it is only necessary now to push the ground rod into the earth, thus getting the ground connection necessary to complete the circuit, slip the clip switch over the wire and connection is made. This can be done instantly under any circumstances.

Before the use of this arrangement, it was necessary to make a hole through the insulation with an awl, which was sometimes very difficult, especially at night, and then push a small point into the strand of the wire. The switch, however, eliminates that trouble, as it is made in the form of a clip, which may be slipped over the wire and by a slight pressure upon the ends of the clip, a number of sharp, needle-like points forced through the insulation, and between the steel strand into the copper one. When the clip is removed, the insulation is not damaged nor its effectiveness impaired in the least.

Company D, signal corps, was organized as a field company on May 1, 1908, and was mounted and equipped for the field about one month later. The company numbers seventy men and is divided into four platoons, and each platoon is divided into two sections. Two of the sections are equipped with wireless outfits, while the other six are furnished with carts and apparatus for laying field telegraph and telephone lines. The company is armed and accoutred so that it can do anything that either infantry or cavalry can do and give a good account of itself should occasion arise.

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DECEMBER 16, 1909.

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

The Regulation of the Telegraph.

Contrary to general expectations, President Taft in his first annual message did not make any reference to the placing of the telegraph and telephone companies under the jurisdiction of the Interstate Commerce Commission, reserving his ideas upon that subject for a future special message. It is believed, however, that the President is in full accord with the opinions of his predecessor upon this question and when the convenient opportunity arrives will place himself on record as favoring the extension of the power of the Interstate Commerce Commission to cover these two important public service utilities.

That this action would be a desirable one is now generally admitted by thinking men throughout the country, many of the executive officials of the various companies themselves now being convinced of the wisdom of such a move, in view of the rapidly increasing number of State public service commissions who are attempting to regulate these important essentials of our present

scheme of civilization and industrial economy, each in its own way and no two in the same way.

The functions of the telegraph to best serve the greatest number of people can not be controlled or regulated by any one State, but if any supervision at all is required or desirable such power should be in the hands of Federal authorities, who can guarantee the same privileges and advantages to citizens of all States alike. If such supervision was provided for the telegraph would probably accept the new conditions with good grace, as by this action they would be free from the attacks of a certain class of critics whose chief aim seems to be to tear down existing institutions without any regard to conditions which would prevail if the present structures were overthrown.

Admitting that this widening of the functions of the Interstate Commerce Commission is both desirable to the public and acceptable to the interests directly concerned, as we have previously stated in these columns, it is extremely doubtful whether any betterment in the service or in the administration of telegraph affairs would follow as a result of the new authority. The problems of management with which the telegraph companies are confronted are constantly increasing in intricacy and only minds trained by long experience in dealing with such matters can be safely entrusted with their determination. In any event, if any is necessary, the National Government should be the sole outside regulating factor in telegraphic affairs; local commissions and laws of individual states, varying as they do in perception, too frequently meddlesome and irrelevant in character, as a rule creating antagonisms instead of promoting interests, which should be mutual in character, should be abrogated in favor of the higher tribunal of the government. The object of the telegraph, like that of the railroads, is to serve the needs of the people at large without regard to the narrowing limits of state boundary lines, and in fulfilling this purpose stumbling blocks should not be placed in their way, as is too frequently the case.

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

any other large public service utility which will bear without discredit as thorough an investigation as to its conduct as will the telegraph.

There is, it is true, graft, unholy combination and commercial immorality extant in the business world, a check to which and its overthrow is demanded, but because this is so it does not follow that an entire moral collapse of the business interests of this country either exists or is impending, or that an entire reconstruction of our industrial scheme is necessary to eliminate all that is dishonest in the management of our great enterprises. We belong to that class of optimists who believe that the world is better to-day than it ever was before; honesty and integrity of purpose are dominant characteristics in the average business man, no matter what we may be told to the contrary, and are the only stepping stones to permanent success and power. This is reflected in the gigantic, intense and strengthening fabric of commerce that binds men together, and which could not long exist if moral soundness in commercial matters was lacking. It is further observed in the growth of eleemosynary institutions, physical expressions of human charity and kindness and good will towards others. But we do not desire to preach a sermon, only to illustrate a great truth. Our prosperity rests largely with our business men who do not offer "an ignorant resistance to every effort for the reform of abuses and for the readjustment of society to modern industrial conditions." Their demands are only for a fair and equitable consideration.

The Directory Issue of Telegraph Age.

A year ago Telegraph Age compiled the first comprehensive directory that had ever been prepared, covering the official personnel and a description of the physical property of all of the companies engaged in the telegraphic field in this country. The gathering of this data involved a vast amount of work, and great care was taken to insure that it should be absolutely correct when published.

The results of our labors met with such general and unreserved approval that we felt thoroughly justified in our belief that there was a place and demand in telegraph circles for a compilation of that nature. With the continued changes which are occurring, however, the useful life of such a directory is very short and in order to keep the publication up to date we are revising and correcting the data therein and will make our January, 1910, issue a similar directory number.

All information which will be contained therein will be received from official sources, and therefore can be depended upon as being reliable and authoritative. In addition to the matter found in the former directory, there will be a considerable amount of other data of interest and value, and we trust that our efforts will meet with the hearty approval of our friends as heretofore. In

this connection we would suggest that January 1 is a good time to subscribe for Telegraph Age and thus secure this splendid issue and we will appreciate the efforts of our friends to induce others to become regular readers of our paper.

Legal.

The Texas Court of Civil Appeals, in a recent case brought before them, decided that a telegraph company cannot limit its liability by the stipulations printed on the reverse side of every message blank. The case in question was one involving the liability of the Postal Telegraph-Cable Company of Texas and that of the Postal company outside of Texas upon joint messages of the two companies. The stipulations on the back of each message attempt to limit the Texas company from liability under certain conditions and entirely relieves it from liability for delay or negligence occurring on the line of any other company over which a joint message is handled. The court refused to abide by the stipulations, pointing out the impossibility of determining the amount of damage occasioned by the negligence of the two lines, adding in conclusion:

"And the two companies in this case being engaged in such a joint enterprise as to render both responsible to persons dealing with either concerning messages to be handled by both, we hold that the stipulation on the reverse side of the message attempting to restrict the liability of the Texas company was not available as a defense, and the trial court properly instructed the jury that the Texas company would be liable for the failure of the other defendant to exercise proper care in transmitting and delivering the message."

Girls as Messengers.

Editor Telegraph Age:

I read with interest your article in the November 16 issue about using girls as messengers. Would say that I have used girls as messengers at this place for the past two years and find them superior to boys in every respect. They are neater, quicker and more reliable and can deliver a message and get back and assist in some of the office work while the average boy is getting started. I did not know that I was starting an innovation. This is a city of about 2,500 inhabitants, and as there are no saloons in Kansas, of course, they do not have to deliver any messages where it would not be perfectly proper for a girl to go. When I used boys as messengers I had to be making changes every month or so, while the girls have been employed from six months to a year.

Yours Truly,

C. H. Parsons,

Manager and Wire Chief, Rock Island Lines.
Goodland, Kan., November 27, 1909.

"Pocket Edition of Diagrams," etc., the latest revised edition, 334 pages and 160 illustrations, published by TELEGRAPH AGE, contains just the information every telegrapher requires.

OLD AND RECENT TOURNAMENTS.

General Information as to Early and Late Speed Trials, with Incidental Comments on the Persons Concerned in Them, and Unnecessarily Complete Reports, Perhaps, as to the Part I Myself Played in Them and in Other Related Events.

BY WALTER P. PHILLIPS.

(Continued from page 829, December 1, issue.)

The first tournament of which anything was written, beyond the bare mention of the winners, was held in New York in the lunch room of the Western Union Telegraph Building, at 195 Broadway, on an afternoon in August, 1884, under the management of Fred Catlin (the Bunnell Key contest), the judges being J. H. Dwight and E. F. Howell, chief operators, and W. B. Waycott, cable manager. The matter to be sent was 500 words, 2,368 characters, part of an address delivered by Hon. Chauncey M. Depew at the unveiling of the Statue of Liberty, and which subsequently became known as: "The Friendship of France." No rules were laid down to govern the contest, the awarding of prizes being left entirely to the discretion of the judges, whose decisions were as follows:

First prize—Gold medal, W. L. Waugh, of the Commercial Telegram Company, Stock Exchange. Superior work, each letter and character perfect; time 11 minutes, 27 seconds.

Second prize—Silver medal, William M. Gibson, of the Bankers' and Merchants' Stock Exchange. Good work; time, 11 minutes, 3 seconds.

Third prize—Decorated key, Frank J. Kihm, of the United Press. Fair work; time 10 minutes, 32 seconds.

Other contestants were: J. W. Roloson, 10 minutes, 10 seconds; L. E. Liddy, 11 minutes, 58 seconds; M. J. Doran, 11 minutes, 32 seconds; W. A. Hennessey, 11 minutes, 51 seconds; E. Delaney, 11 minutes, 52 seconds; Harry Ziegler, 12 minutes, 29 seconds; P. J. Byrne, 13 minutes, 50 seconds.

The performance of Roloson was a most remarkable one, but his sending partook of what has now come to be known as "tournament Morse" and failed of endorsement by the judges. Manager Catlin said at the time that with proper coaching Mr. Roloson would show a world-beating pace.

Great interest was shown in the contest by the fraternity throughout the country.

The next contest took place in the offices of the United Press, at 187 Broadway, on April 5, 1885. The judges were Walter P. Phillips, David B. Mitchell, chief operator in the Race Department of the Western Union, and John W. McLaren, manager of the New York office of the Baltimore and Ohio Telegraph Company. The affair was under the management of Fred Catlin, a chief operator of the Western Union. The

matter transmitted was the same as that used in 1884, "The Friendship of France," and the conditions were the same.

Mr. Phillips announced the winners as follows:

First prize, \$25, contributed by L. G. Tillotson and Company. J. W. Roloson, Bankers' and Merchants' Telegraph Company, Stock Exchange; time, 10 minutes, 32 seconds, for great speed, combined with praiseworthy clearness, considering the fast time made.

Second prize, \$15, contributed by L. G. Tillotson and Company. William M. Gibson, Bankers' and Merchants' Telegraph Company, Stock Exchange; time, 10 minutes, 57 seconds, for speed and pronounced excellence, and no error.

Third prize, \$10, contributed by W. J. Johnston, editor of "The Operator," for speed and fine work combined, Frank J. Kihm.

Fourth prize, \$10, contributed by the United Press, William J. Curtis, for absolute correctness of transmission and exceeding beauty of style.

The United Press awarded a cash prize of \$10 to F. G. P. Griffith, whose fine Morse transmission of 500 words in 13 minutes, 15 seconds, with the left hand, received high commendation from the judges.

Other contestants were: M. J. Doran, 11 minutes, 26 seconds; J. G. McCloskey, 11 minutes, 44 seconds; W. L. Waugh, 11 minutes, 57 seconds; Charles H. Davis, 12 minutes, 1 second; W. L. Prentice, 12 minutes, 27 seconds; R. J. Murphy, 12 minutes, 51 seconds; R. W. Martin, 12 minutes, 51 seconds.

After the decisions were rendered, the officials and contestants were entertained at Mouquin's on invitation of Messrs. Tillotson and Company, through their representative, Thomas J. Smith, an old operator who subsequently took much interest in and did a great deal for the success of telegraph tournaments. Mr. Smith made an interesting after-dinner speech.

Five years later, on April 10, 1890, the National Fast Sending Telegraph Tournament was held at Hardman Hall, on Fifth Avenue, under the management of Fred Catlin, who had now come to be called "the father of telegraph tournaments." The leading telegraph companies showed their interest in the affair by liberal contributions, and electrical manufacturing and supply companies lent their aid without stint, each being anxious to have their keys and sounders win favorable comment. The judges were: S. F. Austin, E. T. Barberie, P. T. Brady, A. S. Brown, J. H. Bunnell, Colonel A. B. Chandler, E. W. H. Cogley, S. A. Coleman, E. H. Cox, E. H. Curlette, M. M. Davis, P. B. Delany, Thomas A. Edison, G. H. Gay, G. E. Holbrook, of the New York World, E. F. Howell, Official Tester of the Western Union, Gardner Irving, E. H. Johnson, F. W. Jones, E. A. Leslie, E. A. Marr, R. W. Martin, T. Comerford Martin, William Maver, Jr., D. B. Mitchell, F. F. Norton, Walter P. Phillips, H. W. Pope, Charles W. Price, Charles Shirley, A. E. Sink, T. J. Smith, J. B. Taltavall,

T. R. Taltavall, of the "Electric Age." Charles Thom. P. J. Tierney, George H. Usher, of the Postal Telegraph Company and W. D. Weaver, Starter, Charles W. Price, who also acted as master of ceremonies, Timer, W. J. Johnston, of the "Electrical World."

It was on the occasion of this affair that Thomas A. Edison sent his characteristic reply to Mr. Catlin, who had inquired of him if he was still interested in the rank and file of the profession. Edison wrote as follows:

Charlotte N.C. Feby 22 90

Friend Catlin,

I hope I haven't changed a particle,

I'd rather have the small-pox than a

swelled head. Put me down for

Twenty five.

Yours
Thomas Edison

Andrew Carnegie sent a check with a note to Mr. Catlin, saying: "If you think an additional \$100 in prizes would be advantageous, I would be glad to give it. Should Class A be all taken by men, and a woman come near the first or second prize, should like to give her a prize."

General Eckert sent a letter of encouragement to Mr. Catlin, enclosing his personal check toward the prizes to be awarded.

James D. Reid, the United States representative at Dunfermline, Scotland, to whom the telegraph world needs no introduction, cabled that he had sent a brooch for the winner of the ladies' class.

In this tournament there were four classes, divided as follows, there being no specific rules for the guidance of judges:

Class A—Free for all.

Class B—For operators who have not a record of 500 words in 11 minutes.

Class C—For old timers, who have been in the business since 1865.

And Class D—For ladies.

The same matter ("The Friendship of France"), was used in this tournament, as in those of 1884

and 1885, but the length of time was reduced to five minutes, as against ten in former contests. This was necessary on account of the great number of entries.

W. B. Upperman, an expert calligraphist from the Associated Press, recorded the transmissions. The judges made the following awards:

Class A—First prize, \$100, B. R. Pollock, Jr., N. Y. & N. H. R. R., Hartford, 260 words.

Second prize, \$70, William M. Gibson, the United Press, New York, 238 words and four characters.

Third prize, \$30, Frank J. Kihm, the United Press, New York, 238 words.

W. L. Waugh was awarded the United Press prize of \$25 for excellence combined with speed.

Contestants in class A were:

A. J. Swan, 215 words, 2 characters; F. L. Catlin, 241 words, 1 character; F. L. Catlin (2d trial), 237 words; H. S. Wright, 203 words, 2 characters; H. D. Paulhamus, 218 words, 7 characters; W. L. Waugh, 229 words, J. P. Bradt, 224 words; W. Davis, 195 words; M. H. Toomey, 230 words, 4 characters; J. W. Roloson, 248 words, 239 words; W. M. Gibson (2d trial, 238 words, 2 characters; B. R. Pollock, Jr., 258 words; B. R. Pollock, Jr. (2d trial), 260 words; W. M. Gibson, 239 words; W. M. Gibson (2d trial), 238 words; 4 characters; H. Peters, 217 words, 2 characters; F. J. Kihm, 238 words; G. W. Simmonds, 221 words, 1 character.

Class B—First prize, \$85, Frank L. Catlin, (broker, New York), 251 words and one character.

Second prize, \$65, W. L. Waugh, the United Press, 229 words.

Third prize, \$30, Frank English, (broker, New York), 225 words.

Other contestants in class B were:

W. L. Waugh, 229 words; Ed. Bishop, 193 words, 3 characters; J. G. McCloskey, 209 words; A. J. Swan, 212 words, 8 characters; Frank English, 225 words; H. S. Wright, 211 words, 1 character; D. Wark, 224 words, 1 character; H. D. Paulhamus, 224 words, 1 character; M. J. Doran, 213 words; M. H. Toomey, 228 words, 6 characters; F. L. Catlin, 251 words, 1 character; R. C. Meedy, 220 words, 2 characters; W. A. Jones, 223 words; O. Hart, 222 words; J. P. Bradt, 220 words, 2 characters; C. W. White, 218 words, 8 characters; A. S. Patterson, 201 words, 4 characters; J. D. Hinman, 214 words; F. F. Norton, 211 words; E. A. Sprong, 203 words; W. Davis, 193 words.

Old Timers' class—First prize, \$50, A. S. Ayres, of the United Press, 229 words.

Second prize, \$40, Fred Catlin, of the Western Union, 217 words.

Mr. Ayres was also awarded the United Press prize of \$25 for combined excellence and speed in this class.

J. H. Dwight sent 138 words and 7 characters, and George M. Eitemiller sent 197 words and 4 characters in the Old Timers' class.

Ladies' class—First prize, \$50, Miss Kate B. Stephenson, of the Western Union, 217 words.

Miss Stephenson was also winner of the handsome Cairngorm brooch, which was given by American Consul Reid.

Second prize, \$40, Miss B. M. Dennis, Western Union, 212 words and four characters.

Third prize, \$20, Miss E. R. Vanselow, Western Union, 210 words, four characters.

Other contestants in the Ladies' class were:

Millie Moss, 191 words, 4 characters; T. V. Froschel, 200 words, 5 characters; A. M. Schaffer, 193 words, 2 characters; J. Schlessinger, 207 words; E. V. N. Garthwaite, 201 words; M. C. White, 169 words; L. Wagner, 185 words, 4 characters; A. E. Findley, 193 words; M. A. Daley, 186 words, 1 character; S. C. Barry, 197 words.

Miss Tillie V. Froschel sent 200 words, four characters, and was awarded the United Press prize of \$25.

Mr. Edison sent a phonograph machine for recording the transmissions, and Mr. Phillips sent a set of his registering and reproducing apparatus for the same purpose.

Mr. Delany sent a tick recording machine with which every tick was faithfully registered.

Miss Adele Erbeling received \$10 from Mr. Price as an acknowledgment of her plucky attempt under trying conditions.

Miss A. E. Findley received \$10 from the management in recognition of her meritorious work.

A. B. Chandler, president of the Postal Telegraph Company, offered a prize of \$10, to which Manager Catlin added \$10 for the best pen copy of any transmission, and Thomas R. Taltavall elected to receive from Mr. Waugh. He was the only receiver, and copied the 229 words sent by Mr. Waugh, his beautiful copy being pronounced by the judges the finest sample of work they had ever seen.

Closely following the tournament of April 10, 1890, was the Southwestern Fast Sending Tournament held at New Orleans on the 20th of the same month, in the rooms of the Board of Trade. The judges were W. D. West, W. J. Cummings, H. H. Smith, T. Westerfield, and J. J. Fowler, and prizes were awarded to the various winners aggregating \$225. The same matter was used by the senders that was used in the three previous contests, beginning: "The Friendship of France," and five minutes was the time limit.

The winners and their records follow:

Class A—Open to all who had an authentic record of 35 words per minute:

First prize, W. S. Brewer, gold medal, 211 words, superior Morse.

Second prize, L. S. Mentzer, box of cigars, 211 words, good Morse.

Third prize, D. D. Jones, silk hat, 210 words, good Morse.

Class B—First prize, T. G. Griffin, silver medal, 194 words, superior Morse.

Second prize, J. W. Gordon, box of cigars, 185 words, fair Morse.

Class C—Winner of prize, P. A. Moaki, silk umbrella, 182 words, superior Morse.

Then came the St. Louis Telegraphers' Fast Sending Tournament, which was held in St. Louis in the Exposition Building on June 8, 1890, the judges being Charles McNeill, E. L. Parmelee, J. R. Garrene and E. H. Johnson, of the Western Union, George McCann and W. H. McLean, of the Postal Company; F. C. Ritchie and Frank Lewis of the Associated Press, and J. V. Sharpnack, of the St. Louis Republic. The contests were under the able management of Messrs. D. B. Grandy, chairman, and Charles McNeill and J. M. Maddox, all of the Western Union. The same matter was used by the senders, as in former tournaments. The results follow:

Class B—Ladies—For highest readable speed. Prizes \$25, \$15, and \$10.

Miss Mollie Landrigan, 206 words, fair, first.

Miss Kate Higgins, 202 words, fair, second.

Miss Flora A. Potter, 191 words, excellent, third.

Class C—Old Timers who were in the telegraph service previous to January 1, 1865. Highest readable speed. Prizes, \$25, \$15, and \$10.

C. F. Turner, 199 words, superior, first.

Mark D. Crain, 197, good, second.

James W. Cook, 179, good, third.

Class A—Open to all, and conditions: For highest readable speed, \$50, \$30, and \$20, and for highest speed, combined with the most perfect Morse, \$25, \$15, and \$10. The judges made awards as follows:

Highest readable speed, J. M. McAndrew, 226 words, fair, first. A. T. Ellis, 224 words, excellent, second.

J. C. McIlvane, 221 words, fair, third.

For speed combined with perfect Morse, A. T. Ellis, 224 words, excellent, first.

T. M. Eckert, 212 words, excellent, second.

F. C. Ritchie, 210-4, excellent, third.

After the St. Louis Fast Sending Tournament in June, 1890, came the contest which was conducted under the auspices of the Telegraphers' Mutual Relief Association, at Hardman Hall, in New York, in March, 1893, the judges being J. H. Emerick, general manager Postal Telegraph Company, George H. Dickinson, Boston Globe; M. M. Davis, electrician, Postal Telegraph Company; Robert W. Martin, night manager the United Press; A. F. Sloewey, chief operator of the United Press, and A. T. Baer. In this contest the matter used by the senders for transmission was an extract from a sermon clipped from the columns of a newspaper of the day of the tournament, beginning: "The Command of Gideon," etc. In the five preceding contests all of the senders had used the extract from Mr. Depew's speech, so that exact comparisons could be made of the work done at each succeeding trial. As there were receiving classes in the contest, the managers decided to use new matter, with which none of the competitors could have an opportunity of familiarizing himself. The management presented liberal cash prizes to the winners: John

W. Mackay presented a handsome gold medal as first prize in the receiving class, valued at \$150, also the second prize, a gold medal, value \$100, and third prize, a nickel-plated caligraph. This was known as the John W. Mackay Receiving Class.

The following is a list of winners at this tournament:

First Event—Ladies' class—Miss Sandberg won first prize for sending, with a record of 500 words in 11 minutes and 14 seconds.

Second prize, 500 words, in 13 minutes, 9 seconds.

Ladies' class, receiving, Miss C. L. White took first prize and Miss Sandberg second.

Second Event—John W. Mackay Message Class—William M. Gibson was chosen to send to the receivers. The time of transmission was one hour, and Gibson sent in that time ninety-seven messages.

The winners in this class were: First prize, B. S. Durkee, of Portland, Oregon, percentage 96.46; second prize, J. H. Jones, of San Francisco, percentage 96.16; and third prize, P. J. Faulkner, New York, 95.29.

The third event was for senders who had not a record of more than 235 words in five minutes, receivers to copy for prizes, and the winners were:

E. D. Moore, 242 words, two errors, good Morse, first prize.

R. C. Mecredy, 242 words, seven errors, second prize.

J. D. Hinnant, 236 words, excellent Morse, third prize.

In this event, C. L. Hayes, of Chicago, received the first prize for receiving, having no error, and H. B. Logan, second, with but one error.

The conditions of the following class were the same, and the winners were:

J. D. Hinnant, of the Commercial Cable Company, 238 words, three errors, first prize.

Frank English (broker), 239 words, five errors.

In this class, E. H. Curlette won first prize for receiving, with a perfect copy, and J. H. Jones, of San Francisco, second, with one error.

Phillips Code Class—Sending and receiving. C. B. Squires sent 500 words in seven minutes, 45 seconds, first prize.

E. H. Curlette, 500 words in eight minutes, seven seconds.

The receivers were C. L. Hayes, first prize, and H. B. Logan and G. P. Howe divided second prize.

All of the contestants in this class, excepting C. L. Hayes, were of New York.

In the championship class, Frank J. Kihm and Frank L. Catlin tied on 248 words, the Morse of each contestant being pronounced as perfect by the judges, but owing to a slight technical error, (the omission by Catlin of periods at the end of two paragraphs), the first prize was awarded to Kihm. In this class, H. B. Logan won the first

prize, for receivers, with perfect copy, and J. M. Winder, second, with one error.

(To be continued.)

A Messenger Boy's View of the Situation.

A Chicago messenger boy, upon being told by a reporter that because of the purchase of a large interest in the Western Union Telegraph Company by the American Telephone and Telegraph Company the use of messenger boys would be dispensed with, said:

"What? No more messenger kids? Kid, believe me, when there's no more messengers there's no more business in this little old pile of bricks. You don't look foolish, but when you slip me that I almost think you're trying to tease me.

"It's all to the good, as they say when they make up a purse for the minister, but it's only good on paper. It can't be did. That's a nice lot of bunk they're slipping you from New York. Youse reporters sure have some swell dreams. How do you do it and fool the boss on pay day?"

"If this info is straight it means close up the shop. Those wise bugs with the side whiskers think they can do without we kids. Let 'em try, says I. But tell me, what is the Board of Trade goin' to do without we kids to hustle for them? I can see me old pal Jim P'atten, now, writing a hot one, and 300 members bribing the telephone girl with candy and flowers to give them a crossed wire.

"And how about the dames out shopping who want that dear little red-haired boy that don't smoke pills to carry their bundles? And the fussy skirt who says, 'O, please, Mr. Telegraf Man, send numbah foun-thirty to owah house to take care of baby this awfternoon.'

"What will I do if this fairy tale pans? Oh, pshaw, I s'pose I'll grab off that job as secretary that my old pard Pierp Morgan asked me to accept lawst week."

The Hudson Word Counter.

Every telegrapher who operates a typewriter should have it equipped with a Hudson Word Register, which is now placed on the market by a manufacturing house which has the reputation of producing the very best material and goods of a superior quality. This simple yet accurate device for counting words written upon the typewriter is easily read, instantly set and has a recording capacity up to 1,500. It unerringly registers the number of words written and thus obviates entirely the necessity and annoyance of counting checks. It can be supplied with attachment for any standard make of typewriter. The device is made in compact form, carefully finished and is an ornament as well as a labor saver. The price is \$5.00 and orders may be sent to J. B. Taltavall, Telegraph Age, 253 Broadway, New York. Orders should state what make of machine it is to be used on as attachments differ.

Should Not All Electric Wires Be Placed in Conduits Under Ground and Reasons Therefor?*

BY CAPTAIN WILLIAM BROPHY OF BOSTON.

To the question "Should Not All Electric Wires Be Placed Underground?" there will be but one answer from the great majority of the people of this country, and that is that they should. The members of the fire departments of the country to a man will say yes, for the reason that they know that they are an obstruction to them in the performance of their duty and also a menace to their lives and limbs and liable to bring death within their ranks. It is true that a large number of the overhead electric wires are perfectly harmless in themselves to life and property, as they will not cause dangerous shocks to persons or cause fires within the walls of buildings, but it can also be said that owing to unavoidable circumstances in some instances and culpable carelessness in others, these become equally dangerous with those that are known to be so, and as a matter of fact more so, owing to their well known good character and their inability to cause damage of themselves. The great majority of firemen and other people will carefully avoid contact with electric light and power wires, but there are many—yes altogether too many—of both classes who will not hesitate to handle low tension wires such as telephone, telegraph, fire alarm and police signal wires, etc., believing them to be perfectly harmless, yet they may at that moment be charged with a "deadly" current from some high tension electric wire, and when such is the case serious consequences will be pretty sure to follow. The great majority of people, and I venture to say the entire membership of the fire departments of the country, believe that the covering on high tension electric light and power wires that are maintained overhead is an insulator and will prevent the escape of the "deadly" current to persons who happen to come in contact with them, but such is not the case, for, as a matter of fact, there has never been an insulating covering produced for high tension electric wires to be maintained overhead that is worthy of the name, that would be durable and reliable and have a reasonable amount of life. Rubber, paper, silk and cambric are the best known insulating materials in use to-day. Pure rubber is never used for this purpose owing to the uncertain tenure of life, and it has to be mixed with certain compounds in order to give it more lasting qualities. The other insulating materials mentioned in connection with rubber cannot be exposed to the elements for the reason that they absorb moisture and would on that account cease to be insulators.

The average citizen will say that all overhead wires should be placed underground, for the reason that the poles and wires are unsightly, an

obstruction, and, perhaps, for the further reason that some of the poles stand on the street where they live, and, perhaps, in front of their houses and lots, but few of them think of such poles as an obstruction to firemen and, perhaps, a menace to them while in the performance of their duty, hazardous enough at all times, but rendered much more so at times by them. Again the average citizen will contend that such poles and wires have no right in and above the surface of the streets, and they should be placed underground.

The first attempt to place electric wires underground was made over twenty years ago, in the city of Chicago, Ill. Demands for additional fire alarm signal boxes were coming in from the most fashionable residential quarters, and when John P. Barrett, then city electrician, proceeded to set poles in the streets on which to support the wires to reach them, he was met by a most determined protest and he had to abandon the work. Still the demand for signal boxes kept coming in, and he was at his wit's end as to how to satisfy a most influential class of people. He had read and heard that electric wires were placed underground in one of the European cities and he determined to try the experiment, and he laid a pair of wires underground in an iron pipe to a fire alarm signal box, and it worked for some time fairly well, but it ultimately failed. However, he persevered and by trying different kinds of insulating covering for the wires he finally succeeded in having a reliable fire alarm circuit underground. He became an ardent advocate of underground wires, and contended that all overhead wires in the city of Chicago should be placed there. He was met by determined opposition by all those engaged in the electric business, with the single exception of the Bell Telephone Company. He persisted, however, and finally won over the city authorities to his way of thinking, and a beginning was finally made in placing high tension electric light and power wires in conduits, underground, but the work was in a great measure experimental, and all kinds of material was used and tried for conduits, such as wooden boxes, wooden pump logs, and various kinds of other material other than wrought iron, which was considered too expensive, but finally sheet iron cement-lined ducts were adopted, but they have long since been replaced by vitrified clay and fibre ducts.

Before the advent of the telephone the overhead electric lines in existence were those of the various telegraph companies, district messenger companies, fire alarm and a few private telegraph lines, none of which were looked upon by the community at large as dangerous, and being comparatively few in number, no popular outcry was raised against their existence in the public streets and highways. With the advent of the telephone exchanges came a large increase in overhead electric wires, reaching out from those busy hives to the thousands of people who were thus placed in communication with each other. After the

* Abstract of a paper read at a recent convention of the Massachusetts State Firemen's Association, at Plymouth, Mass.

great advantages of this new and ready means of communication were fully realized, then came the demand for intercommunication between towns and cities, and as a result long distance telephone lines now connect nearly all the important towns and cities in the United States, and the time may not be far distant when conversation will be carried on between the people in this country and Europe over submarine cables, and such cables may gird the earth before many years have passed.

About the time the experiment of placing electric wires underground was being tried in Chicago, the American Bell Telephone Company, through its subsidiary companies, with its usual keen business foresight, decided to place its overhead wires underground in the business portion of all cities in which telephone exchanges had been established. In very many cities the privilege to build conduits for this purpose was readily granted, but, strange to say, in some others the proposition to do just what everyone was anxious to have done, to place the wires underground, was met with decided opposition on the part of the municipal governments. In some of these cases, after long and persistent efforts on the part of the company's representatives, and after long and vexatious delays permission was finally given, though reluctantly, while in some other places permission is still withheld for various reasons.

While combinations can be formed by the members of municipal governments to prevent the telephone companies from placing their wires underground, it is not so easy for them to agree on a plan other than that proposed by such companies to accomplish this much desired end, due to the fact that their opposition to the granting of a franchise is due to entirely different motives. One class opposes such grants because they fear it would result in giving the company seeking a monopoly and prevent competition, so much desired by the average citizen; another, because they are bound to oppose anything asked for by a corporation, for the reason that they look upon them as being in a measure public enemies; and another, who believes in municipal ownership, control and operation of all kinds of public utilities now carried on by private corporations. This diversity of opinion often results in the postponement of this much desired improvement being made by those owning the largest amount of overhead wires.

The first wires that were placed underground by the telephone company were in the city of Boston in the year 1882. They were laid in square wooden boxes ending in brick manholes, the boxes or ducts being treated with creosote to prevent decay, the wires being formed into a cable and covered with lead. In time wooden ducts were replaced by those of wrought iron lined with cement, imbedded or surrounded with concrete, but these have given way to ducts made of vitrified clay and wood fibre, which are also laid in concrete. In 1894, when the work of plac-

ing all classes of electric wires, except long distance telephone and street railway trolley wires, underground began, the telephone company had constructed over forty miles of conduit, over 239 miles of single duct and had drawn in over 208 miles of underground cable. To-day in the city of Boston alone, there are over 297 miles of conduit, over 3,792 miles of single duct and about 2,427 miles of cable. This does not include the ducts and cables for services to buildings. Besides these there are over 111 miles of what is called Edison tubes, which are laid directly in the ground and contain three wires, each tube being 20 feet in length and connected to junction boxes of cast iron.

The city of New York followed the example of Chicago in decreeing that overhead electric wires should go underground. The authorities were met by the fiercest kind of opposition by the electric lighting companies, who refused to comply with the conditions of the underground acts, and remove their wires from above the surface of the streets and place them in the underground conduits provided for them. They claimed "that the city authorities had no right to destroy their property; that their lighting systems would not operate successfully underground, and that the rental charged for the use of the conduits was excessive, and that it would ultimately drive them out of business." The underground electrical conduits in the city of New York were and are built by a private corporation and rented to the electric companies using them, it being chartered by the legislature. There are two sets of conduits provided, one for the high-tension wires, such as electric light and power, and the other for low-tension wires such as telephone, telegraph and police and fire alarm wires. Not until the city authorities cut down the poles and removed the wires from the streets along the line of the electrical conduits did they finally yield and place their wires in the ducts provided for them. No opposition was offered by the telephone company, but on the contrary it gave its hearty support to the plan.

Notwithstanding the opposition to an underground system when first proposed in New York, no one now engaged in the generation and distribution of electricity for any purpose can now be found who does not believe that the best place for electrical conductors is under the surface of the ground. Where underground construction was substituted for overhead, the wires, poles, cross-arms, etc., were removed and the capital invested therein was practically wiped out, as the wires went into the scrap heap and the poles, etc., were used as firewood, except that a few of them might be used in the outlying districts.

Up to the present time there has not been produced a covering for overhead wires that could be called an insulator, and consequently, overhead wires could not be placed underground, a wire having an insulating covering had to be used. Up to something over twenty years ago

there was no demand for highly insulated wires and cables for underground construction, and those engaged in the electric light and power business, who had used nothing for their overhead circuits but a wire covered with cotton braid and impregnated with a zinc paint, knew that such wires could not be placed underground and made to operate successfully as the current would escape therefrom to the ground as water escapes from a line of unlined linen hose when first put through it, and they had reason to believe that the manufacturers of insulated wire could not produce wires and cables suitable for their purpose. But when the demand came for highly insulated wires and cables to be placed underground the manufacturers assumed the task of making the same and finally succeeded, and while perfect insulation has not yet been found, practical insulation for underground wires has been produced and is now in successful operation.

There are three classes of wires at the present time which are not placed underground: The overhead trolley wires of street railways and long distance telephone and telegraph wires, which extend a distance exceeding twenty miles in a straight line from the office or exchange. It is not possible to operate these latter-named wires much beyond the distance named owing to what is known as induction.

This difficulty, however, is gradually being overcome, and the limit of twenty miles over which conversation can be carried on over underground circuits is now considerably exceeded, and in time it is hoped that the limits of articulate speech over underground wires and cables will be greatly extended.

I have not described the modern method of placing wires underground; the difficulties experienced with them when there; the serious consequences which are the result of the failure of the insulation of underground wires and cables, for as yet perfect and enduring insulation for all classes of electric wires has not been discovered; the difference in cost between overhead and underground construction as well as many other subjects that might be of interest to you all, but I will say that the trials and tribulations of those engaged in the electrical business do not end when all wires are placed underground, and the difference in the cost of maintenance is not near as great as most people believe.

In many cities and towns the telephone wires are underground, and in all cases one duct is reserved for the use of the fire and police wires. I believe it to be the duty of every chief of fire department, every superintendent of fire alarm and every fireman to urge the municipal authorities to place the fire alarm circuits in such ducts, and to go still farther and urge the construction of underground conduits in addition until every foot of fire alarm wire is placed underground. Until that is done the degree of perfection and reliability that is possible in a first-class fire alarm

system can never be attained, for the reason that the condition of overhead electrical circuits is nearly as crude as it was when the first telegraph line was constructed. Failures of and damage to the fire alarm apparatus will continue so long as the wires remain overhead.

Functional Organization.

At a recent meeting of the Southwestern Telephone Society, Mr. H. J. Pettengill, president of the Southwestern Telephone and Telegraph Company, who for many years previous to 1899 was superintendent of the Postal Telegraph-Cable Company at Boston, delivered an interesting and instructive lecture upon the subject of "Functional Organization." Mr. Pettengill's remarks in part were as follows:

"To begin at the beginning, I may say that the word 'organization' as given in Webster's dictionary, is the act of arranging in a systematic way; and the word 'functional' comes from the Latin *functio*, which, freely translated, means a division of labor. From these two words you may see that 'functional organization' means a division of labor of the company in a systematic way. The functional idea is not a new one. Many of the railroads adopted it some years ago. The great Pennsylvania system with its \$315,000,000 of capital is organized on this plan, and with most railroads it has been a great success.

"The New York Telephone Company was the first of the telephone companies to reorganize on the functional plan, and one year ago the Southern Bell adopted it, and as that company is so much like ours in the territory covered and in its widely scattered groups of exchanges, we watched the experiment with a great deal of interest. It proved so successful with them that if we can do half so well we will be satisfied.

"It is only in late years that we have needed to think of specialized organization for it is not so long ago, that the general manager carried his office around under his hat. However, as the company has grown under its old geographical organization, the mass of orders that have accumulated, and the red tape that has been evolved, has made the execution of the work less perfect than we would desire. In fact, I am reminded here of a story told me by Superintendent of Construction Johnson, a few years ago. He said that one of his foremen called him up from Ft. Worth and said, 'I want you to send me the biggest cable reel you have.' 'Why,' said Mr. Johnson, 'You have dozens of our large size cable reels in Ft. Worth.' 'Yes,' said the man, 'I know that, but I want a bigger one yet. I want the biggest you have.' 'Well,' said Johnson, 'Of course I will send it to you, but what do you want it for?' 'I want it to wind up some of this red tape we have over here.'

"Under the Territorial or Divisional form of organization, each Superintendent and Manager was expected to be an expert on canvassing, ac-

counting, collecting, exchange and toll operating, construction and maintenance and the distribution of the expense account. This resulted in each one of these officials being a sort of a Jack-of-all trades, and, generally speaking, a master of none. In this connection I am reminded that when Mr. Linnington was manager at Houston an irate subscriber said to him, 'I don't believe that you know a blank thing about the telephone business.' 'No,' said Mr. Linnington, 'I don't suppose I do, but I ought to, for each of the dozen officials that come down from Dallas tells me all he knows about the business, and what he doesn't tell me the 5,000 subscribers in Houston do.'

"Under the new form of organization we hope to develop not only specialists in their line of work, but to develop character. The head of each department will be held responsible for the results; and as authority and responsibility must go hand in hand, he will be given commensurate authority over his department. He and each one of his subordinates will be expected to give his best thought to the improvement of our service, and the building up of an esprit de corps that will be second to no other telephone company in the United States. Every man may rest assured that merit and ability will receive substantial recognition, and I hope the time is not far distant when it will not be necessary to go outside our fold for competent and capable men to fill any vacancy that may occur in our ranks.

"On the other hand, sloth and incompetency will not be tolerated, and the man who cannot make good is not wanted in our service.

"Men who do the very best they know, may be sure that their efforts will sooner or later be recognized. If every man will try to earn a little more than his salary, he will soon come under the observation of his superior.

"Each official should not only fulfill the specific duties assigned him, but must co-operate and maintain harmonious relations with the other departments, conferring and advising on matters of interest to these departments, to the end that all may work as a unit for the success of the company.

"I want to say to you gentlemen, that the success of this new plan of operation depends upon every official and employe observing not only the printed instructions, but upon entering upon his duties with a firm determination to do his level best and to carry out his instructions, not only to the letter but in spirit. It is of the utmost importance that there be a friendly feeling between the heads of the departments, not only at headquarters, but in the field; the desire and intention to co-operate with all the officials not only of his own department, but of the other departments with whom he has relations, having in mind that the company's success means his success and advancement.

"Our watchwords should be courtesy, loyalty, co-operation and hard work.

"Every employe should be loyal. Do not criti-

cize your company, your superior, or any fellow employe in your dealings with the public.

"Our attitude should be one of implicit faith in the workings of our company and of each and every one of its employes, and this attitude if brought to the front whenever the opportunity presents itself, is bound to have the desired effect.

"You often hear people say that it's luck or pull that gets a man along in this world. I would tell you that it is no such thing; it is ability, intelligence and hard work, and where a man has these three things, and has confidence in his company and confidence in himself there is no height to which he may not aspire."

The Treating Habit.

One of the Western towns is now a "dry" town—that is, it has no saloons. This, however, is a matter of recent occurrence.

A few days ago four telegraphers started from their office, headed for the baseball grounds.: Their course took them by four buildings formerly occupied by the saloons, which impelled one of them to remark:

"I'd ask you in to have something, but everything is closed."

"Oh, not all the places are closed," said another one. "Come in here with me and have something."

With this the speaker headed into a clothing store, followed by three curious comrades.

"Give me a lay-down collar, size sixteen, and give each of these fellows the kind of a collar they want."

Each man gave his size and style and the clerk wrapped the four collars in separate packages. Each man took his package and walked out. Not a word was said for about a block, and then the man who had first spoken blurted out:

"Say, wouldn't all of us have a lot of collars and ties, and shirts and such things if we'd had good sense?"

Weber's Handy Electrical Dictionary is a practical handbook of reference, containing definitions of every term or phrase used in the electrical industry. This vest pocket size indexed handbook contains over two hundred pages and over three thousand definitions. Notwithstanding the limitations of space, the work is so clear and lucid in its definitions, and so comprehensive in its scope, that it is not only an indispensable guide to the electrician in the intelligent performance and understanding of the duties of his profession, but is a work of the highest order of educational merit as well. Price, 25 cents. Address orders to J. B. Taltavall, Telegraph Age, 253 Broadway, N. Y.

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

Train Despatching by Telephone.*

BY GEORGE H. GROCE, CHICAGO,

Assistant to General Manager, Illinois Central Railway.

The telephone is now in service as a medium of handling or despatching trains on over thirteen thousand miles of steam railroads where the telegraph was previously used. On more than half of this mileage the service has been in continuous operation for over one year. This thirteen thousand miles includes both double and single track operation and it is wholly made up of despatching districts having very heavy traffic.

The Illinois Central Railroad Company has equipped circuits for train despatching on over two thousand miles of its most important lines. Fourteen hundred and thirteen miles are in actual and continuous train despatching service. On five hundred and eight miles extensive line reconstruction has caused a delay in putting the circuits into service, although the equipment is complete. On two hundred miles the wires are in place and the installation of instruments progressing rapidly.

Successful results are universally reported by the users. Every claim made by the early advocates of the telephone in this new field has been verified and every prediction realized.

Numerous features are to be considered in deciding between the telegraph and the telephone in the train despatching field.

Naturally the first consideration is safety and reliability. Which of the two systems will best protect the lives and property of the employes and patrons of the railroad?

When the Morse register in telegraph service began to be replaced by the telegraph operator who worked by sound there developed among "sound" men a very strong ambition to be able to read the language of the ticking instrument and place the message upon paper without interrupting the sender. The sound operator who frequently "broke" the sending operator, was disgraced. As a rule the sending operator who could make the receiving operator "break" took pride in his ability to do this and after each break the sender would put on more steam and, if possible, send faster than before the interruption. The receiving operator was, of course, conscious of the fact that not only the operator sending to him knew of his inability to hold down his end of the wire, but that every other operator along the line would "get wise." In a certain sense the man's reputation was at stake and in fact to some extent his retention in the service was affected. Operators deficient in ability to receive would make an effort to keep up with the sender by omitting words to be filled in later from memory and frequently the message as received was the result of considerable guess in the receiving operator's effort. In a great measure this condition exists to-day.

* Abstract of a paper read before a recent meeting of the Central Association of Railroad Officers at Cincinnati.

In many cases an operator who is unable to receive and properly record a message or train order as it is sent by the sending operator or train dispatcher, scratches along and, by writing down a considerable portion of the message or train order which he is receiving, apparently keeps up with the sender, but in reality has an incomplete message or order. It is not an unusual practice for operators to rewrite orders that they may be more legible, and the danger in copying an order in this manner can well be understood. As a matter of fact under the standard rules adopted by the American Railway Association a recopying of orders is forbidden, except where the copy, as received by the operator from the telegraph instrument, is placed over a new set of blanks and the order traced for the purpose of insuring a correct copy. The rules of the American Railway Association also forbid erasures or interlineations in train order work.

Many serious errors resulting in loss of life and great damage to property have been the result of an operator's being unable to copy an order properly as it was sent to him, but trusting to memory for a later insertion of omitted words. As a matter of fact, some operators of very fair ability, unable to keep up with the train dispatcher, who may be a fast sender on the Morse key, drop words in an effort to keep up and maintain a reputation as an operator. There is only a small portion of a man's time on duty when there is anybody around him to check up and discourage this dangerous practice. The receiving operator knows that the man sending to him cannot tell whether or not he has skipped some of the words in his efforts to keep up with the sender.

In telephone work this feeling of disgrace at not being able to place a message upon paper as rapidly as the sender may speak has never been introduced.

In telegraph work, the beginner, who has served his apprenticeship in some railroad office and who can, while his teacher is standing over him, take a train order in first class style, invariably gets the "buck fever" upon the occasion of taking this first train order upon his own responsibility. In the telephone service I have seen a great many trainmen, yardmasters or yard foremen receive and write down a train order for the first time in their lives and in no case have I ever found one of these men who ever experienced that feeling which comes over the beginner in telegraphy.

In this connection it is also to be considered that the speed at which an order is sent by telephone has a very definite means of regulation. The train dispatcher transmitting an order by telephone to one or more persons, speaks at a speed regulated by his own act of writing the order during the time he is talking. By this means the train dispatcher is able to gauge definitely the average speed ability of the man copying the order. In the telegraphic system of train despatching a different practice is followed, as is well known. A dispatcher using the Morse

telegraph sends the train order as it is formed in his brain and without recording it simultaneously in written form. As a rule train dispatchers are good operators and capable of transmitting over the wire at a more rapid rate than the ordinary operator of to-day can properly write on manifold paper. After the order has been transmitted by the dispatcher in the Morse telegraph system, the dispatcher copies it in a book provided for the purpose when the order is repeated to him by one of the operators to whom it was sent.

It would seem therefore that while it is admitted there is the possibility of a misunderstanding of words transmitted by telephone the facts when carefully weighed show that the danger is less than the recognized dangers attending the use of the Morse telegraph system. Therefore, although the telephone is yet young in this particular service, I believe we can, upon merit, fairly answer the question of safety in favor of the telephone.

Continuing the comparison of the merits of the two systems, I would place adaptability as a second consideration.

It is hardly necessary to speak upon this point further than to mention the wonderful growth of the telephone as a communicating agency. In railroad work we want what we want when we want it. Telegraph operators are not always available when it is necessary to establish a new point of communication. The demand for telegraph operators is to-day much greater than the supply. The building of new lines of railroads; the extension of existing lines and the increased traffic in general is making it necessary that more offices be opened and operated. The use of the telegraph system limits the number of offices to the number of men available. The use of the telephone system enables railroad companies to open and operate offices for the handling of trains when and where they may be needed.

I believe there is but one other general subject to be considered in comparing the two systems and that is the matter of expense. Each telephone train-despatching circuit, when properly constructed, will cost for installing a trifle over three times as much as the standard Morse train-despatching wire in use to-day. (This is based upon using two copper wires each weighing two hundred and ten pounds per mile in a telephone circuit and is in comparison with one number eight gauge iron wire for the telegraph circuit.) Such a telephone circuit, however, will last not less than three times as long as the ordinary Morse train-despatching circuit. Each telephone circuit will cost for maintenance from fifty to seventy-five per cent. more than the maintenance of an ordinary Morse train-despatching circuit.

To offset this increased cost there is a decrease in the cost of operation in favor of the telephone system of despatching. While this decrease is actual and has been demonstrated, it is the result

of varying conditions, and owing to the limited time which the telephone has been in use and the experimental nature of its service, no definite statistics can be given. It seems reasonable to say, however, from figures now at hand, that beyond the increased investment required for the telephone system, the gross operating expense by telephone will not exceed the gross operating expense by telegraph.

While I am thoroughly convinced of the advantages to be gained by the use of the telephone, I desire to say that I have no idea of seeing the telegraph on railroads entirely replaced by the telephone. On some of the small roads this may be the result; on the larger roads, however, it is my opinion that the ideal condition will be to handle trains by telephone and to have each division equipped so that the managing officials can use the telephone for the transmission of all local business of their division; the train dispatcher's circuit in each case to be paralleled by a secondary circuit to be used ordinarily for message work, but to be taken for train despatching when necessary. With this telephone equipment on each division the general headquarters will be connected with each division headquarters and each important terminal or large commercial center, as well as each division be connected with the adjoining division by a system of telegraph wires. These telegraph circuits would, of course, be what are generally considered through circuits, and the principal offices on them would do a very considerable business; enough, in fact, to have high-class operators using typewriting machines and handling business rapidly. Messages originating at general headquarters for some small local office would be handled by telegraph to the nearest division office and from there sent by telephone. Messages from small offices for the general headquarters would be telephoned to the most convenient relaying office and from there handled by telegraph. In other words, it would be my idea to do long-distance work by telegraph and local and despatching work by telephone, combining the two services to the best advantage.

Candor compels me to say that to the pioneer in telephonic train-despatching things are not always what they seem. Experimenters in a new field are always liable to run up against unforeseen difficulties and the telephonic train-despatching proposition is no exception to the rule. The apparatus which gave excellent service in ordinary commercial telephone work has to be given considerable assistance when applied to a train-despatching circuit.

To begin with, the apparatus used; the wires constituting the circuit; the pole itself and all of the other accessories, must be first-class. In telephone work on train-despatching circuits a higher general standard of construction and maintenance is required than that usually practiced in commercial telephone work or Morse train despatching.

My personal experience to date indicates that the best train despatcher's circuit is composed of a pair of copper wires, each weighing 210 pounds to the mile, generally transposed every half mile, but having more transpositions when in the neighborhood of high potential alternating current electric lines; good telephone instruments installed upon the bridging principle; taking the two main wires only into offices thirty or forty miles apart for despatching purposes; the calling apparatus to be on a separate six-gauge iron wire; both circuits to be provided with lightning arresters which will really protect the instruments and their users; induction coils and the coils of the transmitters and receivers to be of the best possible construction and better than is generally furnished in the ordinary commercial telephone. Experience has shown that the use of what is known as the impregnated coil serves to protect against the effects of lightning. The induction coil, which is an important part of the installation, should have a primary winding of about three-tenths of an ohm in resistance and a secondary winding of about fourteen ohms in resistance: the coil to be about four and a half inches in length. Especial care should be taken in the construction of ground wires to serve as paths for shunted lightning, experience having shown that the ordinary ground as provided on a telegraph line is generally defective or insufficient to invite the lightning to take the ground path and thereby save the instruments or their users.

While I have declared in favor of the calling device operating upon a wire separate from the talking circuit, this practice is not a necessity. The calling device can be, and in most cases has been, installed upon the talking circuit. It may appear that the separate calling wire is an added expense, but this is not actually true. Some telegraph wires are generally necessary and a first-class telegraph circuit can be operated over a talking circuit, or a number of talking circuits, without interfering with the talking qualities. As a matter of fact, in one case with which I am acquainted, a telegraph circuit worked over three despatcher's circuits, appears to increase the talking efficiency of the different circuits. It is possibly the result of the slower telegraphic signals enlivening the receiver diaphragms and preventing a sleeping tendency.

The dual transmission of telegraphic and telephonic signals over one circuit is not practical where the calling device is operated on the talking circuit. Not only one telegraph circuit, but two circuits, may be operated over one talking circuit, but this practice introduces extra equipment on the line, which is objectionable from a telephonic standpoint.

The separate call wire is not therefore an increased expense, while it certainly simplifies the talking circuit construction and permits the attainment of the best talking qualities obtainable.

To Everybody, Everywhere.*

BY JOHN F. SKIRROW.

Associate Electrical Engineer, Postal Telegraph-Cable Company.

Paraphrasing the famous Postal sentence: Did you ever stop to consider the amount of wholly unnecessary and therefore wasteful work that is done in the world, and specifically the unnecessary and time-wasting things that you do yourself?

For instance, how many letters do you write that serve no useful purpose, and how many questions do you ask in your letters that entail work upon others which yields no return? It is so easy to ask questions that involve expense in the answering that it is often not realized what a tremendous waste in labor there is in this direction.

A recent estimate made of the cost of answering a useless question, figuring the value of the time of the various officers and clerks involved showed a total of over \$5.

It is safe to say that a considerable proportion of the letters written are unnecessary, and that of the necessary ones many of the words used are superfluous.

We often hear the statement that "My desk is so piled up that I don't know which way to turn," or, "I don't know how to keep up with my correspondence, it is getting so heavy." In a majority of such cases an investigation of the correspondence of the complainant would reveal a lot of useless work, and a rolling snowball effect built up by unnecessary questions which have yielded a crop of further unnecessary questions and answers.

On the other hand, do you realize what an enormous amount of unnecessary work you can cause by failure to properly answer questions that are asked. The average correspondent would appear to both read and answer letters carelessly, entirely overlooking some questions raised and answering others in such an incomplete way that further correspondence is entailed.

"Time is the essence of things." It is our basis for everything material. We can't afford to waste our time doing useless work, and we have no right to cause others to waste their time.

Are you making useless records just to have something to show and talk about? Are you writing letters which have no object save that of impressing the recipient with your erudition? Are you making reports mainly with the object of showing how much better your work is being done than that of others? I might go on indefinitely with similar questions, but we can all ask these questions ourselves. There is so much useful work to be done in the world that it is derelict to waste time doing the unnecessary.

Therefore I ask: Do you ever stop to consider what constitutes waste? It all begins with waste of time. Are you wasting yours, and are you causing others to waste theirs?

* Article appearing in "The Postal Telegraph" for November.



KERITE



Insulated Wires and Cables

KERITE has back of it an unequalled record of half a century of successful service under the most adverse conditions. It improves instead of deteriorating with age.

Efficiency and safety in electrical installations depend chiefly on insulation. For fifty years KERITE insulation has been the standard of excellence.

Results count. KERITE wires and cables installed half a century ago are in service to-day. The wonderful durability of KERITE insures the highest safety and economy.

Initial tests determine the properties of an insulation only at the time they are made. They do not determine how well it will do its work years afterward.

The indestructibility of KERITE and its power to resist deteriorating influences should be carefully considered in specifying an insulated wire or cable.

Experience of others should be useful to you. Insure your service by using KERITE.

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The Railroad.

Telegraph operators in relay officers, wire chiefs, and managers on the Atchison, Topeka and Santa Fé Railroad have received an increase in wages of \$5 a month.

Mr. T. M. Schumaker who was recently elected vice-president and traffic manager of the Denver and Rio Grande and Western Pacific Railroads, began his railroad career as telegraph operator upon the Big Four in Ohio at the age of sixteen.

Mr. G. A. Cellar of Pittsburg, superintendent of telegraph of the Pennsylvania Lines West of Pittsburg, was a recent New York business visitor as was also Mr. W. C. Walstrum of Roanoke, Va., superintendent of telegraph of the Norfolk and Western and Mr. W. F. Taylor division operator of the Pennsylvania Railroad, Altoona, Pa.

Mr. H. U. Mudge, recently elected president of the Chicago Rock Island and Pacific, began railroad work at the age of sixteen as section hand and soon graduated from that into a telegraph operator. In a biographical sketch appearing in the Railroad Age Gazette, Mr. Mudge is quoted as saying himself, however, that he was a "ham" operator and in fact about the worst "ham" operator that a railroad ever had.

Mr. George Goodell, recently appointed general manager of the Great Northern Railroad has been presented by James J. Hill with a handsomely equipped private car. To christen the new car Mr. Goodell entertained in it with a Thanksgiving dinner his aged mother and other members of his family. Mr. Goodell began his railway career at the age of sixteen as a telegraph operator at a water tank station in Southern Iowa.

At the recent meeting of the Eastern Division of the Association of Railway Telegraph Superintendents held at Washington, D. C., a sub-committee was appointed to report on the new standard railway agreement presented by the American Telephone and Telegraph Company, consisting of E. P. Griffith, chairman, L. B. Foley, F. G. Sherman, and A. B. Taylor of New York, N. E. Smith of New Haven and J. B. Fisher of Philadelphia.

The Lehigh Valley Railroad Company has completed and placed in service December 6, a telephonic train despatching circuit on its Mahanoy and Hazleton Division located in the Lehigh region of the anthracite coal fields. The circuit erected is of 190-pound copper. The train despatchers are located at Hazleton, the lines radiating from that point east and west with six branch lines varying from one-half mile to eleven miles in different directions. There are thirty-six stations equipped with selectors and ten one-way stations—the latter at places where there are no operators, being intended for train men when necessary for them to get in touch with the train

despatcher. A storage battery of one hundred volts supplies current for the operation of the the selectors, and a similar battery of four volts for transmitting purposes at the despatcher's office. Special arms so constructed as to make it necessary for all parties using the phones at way stations to talk directly into the transmitter were installed at each station equipped with selectors. The line construction involved 97.4 geographical miles or 194.8 wire miles. An additional line is being erected on the Lehigh Division between Penn Haven Junction and Easton, a distance of fifty-four miles, which will be ready for service about the middle of January.

Mr. I. T. Dyer, vice-president of the Association of Railway Telegraph Superintendents and chairman of the entertainment committee for the Los Angeles convention which meets May 16-20, 1910, is getting well under way his plans for that gathering. Arrangements are being made for short trips to several of the many points of beauty and interest in the vicinity of Los Angeles. The local telegraph and electrical people are co-operating with Mr. Dyer in his efforts to make the convention a success and those who contemplate attending may rest assured that nothing will be lacking to make their visit a thoroughly enjoyable as well as profitable one. Mr. W. E. Harkness of New York, who has been appointed chairman of a sub-committee of entertainment to assist Mr. Dyer, is enthusiastic over the convention and can be depended upon to arouse the interest of the eastern members of the association.

The Chicago and Northwestern Railroad Company has recently purchased apparatus for a complete telephone train despatching circuit extending from Chadron, to Long Pine, Neb., a distance of 198 miles. The circuit will be very complete and the line itself has been constructed entirely of new material. The telephone method of handling trains is of special value in sections such as that between Chadron and Long Pine, owing to the fact that during certain seasons of the year a great many of the stations consist simply of sidings. These stations, however, during a large portion of the year are important shipping points for the ranchers residing in their vicinity. In many places there are no telegraph stations and at such points telephones will be installed, rendering it possible for any authorized person to obtain stock cars or other freight accommodations much more rapidly than would be possible if it were necessary to handle the business through the nearest telegraph office. At a great many of these sidings local freight trains and other trains are held waiting for passenger trains and in case of delays this arrangement has been a source of considerable expense, due to the fact that it has been impossible to get word to these trains and arrange for their forward movement. These delays will be minimized by the use of the telephone system of train despatching.

The Louisville and Nashville Railroad is installing a complete up-to-date telephone train despatching circuit between New Orleans and Mobile. The installation of this circuit has been somewhat delayed, owing to the very severe storms which have recently occurred in that vicinity, destroying not only a considerable amount of the telegraph pole line, but the track and road bed as well. This circuit will be the first to be installed in that section of the country for the purpose of handling trains by telephone and will be watched with considerable interest by the other roads in that vicinity. This is the second circuit installed by this railroad, the former one being between Louisville and Cincinnati. The officials of the road report that the service on the first one is giving entirely satisfactory service in all particulars.

Radio-Telegraphy.

A wireless telegraph station has recently been opened for commercial use at Port de l'Eau, Algiers.

Mr. S. S. Bogart of New York, first vice-president of the United Wireless Telegraph Company has returned from an extensive trip of inspection of the company's plants along the Pacific coast. While in the far west he met many of his old time telegraph friends.

Mr. W. Marconi while in Montreal recently is quoted as saying that his company expects the Canadian government to allow them the same privileges as the cable companies enjoy and that if those terms are not granted to them they will establish their own land lines and stations.

A patent, No. 942,044, for wireless telephony and telegraphy has been taken out by A. W. Sharman of Clapham, London, Eng., for telegraphing through the earth by joining the poles of a low tension current and the two ends of a self induction coil each to earth to a plurality of pairs of contacts. Adjusts resistance of the coil to the rest of the circuit, suddenly reduces the low tension current and when it is at a minimum impresses a maximum voltage from the induced direct current through the coil, on the earth contacts.

A patent, No. 941,565, which has been granted to Reginald A. Fessenden, describes a method for locating the position of ships by means of wireless telegraphy. According to the arrangement proposed, signals of predetermined character are sent out at regular intervals from two or more wireless telegraph stations situated at fixed points, each vessel locating its own position by measuring and comparing the strengths of the signals received. Each land station sends out a distinctive signal so that it may be recognized immediately by any vessel. Moreover, the strength of the signal from each land station is varied so as to form a succession of signals of gradually varying intensity so that each signal shall produce the same intensity at a point twenty

miles farther from the station than the signal immediately preceding it. Thus the operator on each vessel first identifies the station from which each signal is being sent, estimates the relative distances from the vessel to each land station and thereby determines the position of the vessel on the sea.

It is reported that the Marconi Wireless Telegraph Company, in return for a license to erect a station at Johannesburg, South Africa, has offered to compete with the cable companies by accepting messages at one shilling a word, instead of the present two shillings and six pence rate. A twenty-years license is asked for, and the Marconi directors are prepared to insert a clause in the contract to the effect that the station shall become Government property at the end of that period.

Mr. Nikola Tesla has announced that he has perfected a new system of wireless telegraphy and telephony in which the principles of transmission are the direct opposite of Hertzian wave transmission. In the latter, the transmission is effected by rays akin to light, which pass through the air and cannot be transmitted through the ground, while in his new system the Hertz waves are practically suppressed and the entire energy of the current is transmitted through the ground exactly as though a wire of low resistance.

At the meeting of the Wireless Institute of New York, held in the Engineering Societies' Building, December 1, Mr. W. E. Smith presented a paper entitled "Conversion of Electric Oscillations into Continuous Current by Means of the Vacuum Valve?" Mr. Smith explained in detail the construction of the Fleming oscillation valve and its operation when used in wireless telegraphy.

The valve consists of a low-voltage incandescent lamp, the filament of which is surrounded by a metallic band separated slightly from the filament, the intervening space being exhausted to a high degree. When the filament is heated by means of electric current from a battery of a few cells the space between the filament and the metallic band becomes ionized and possess practically unidirectional conductivity. When inserted in a circuit subjected to electric oscillations partial rectification takes place on account of the high resistance for current in one direction and low resistance for that in the other. When arrangements are properly made from eighty per cent to ninety per cent of the oscillating current appears as unidirectional current. Either a galvanometer or a telephone receiver can be used as a detector of the received oscillations. In the discussion of the paper the fact was brought out that the De Forest "Audion" differs essentially from the Fleming oscillation valve in that with the former, use is made of a second isolated low-voltage battery to effect the ionization of the space between the filament and the metallic plate separated therefrom.

In a recent article in the Physical Review, Mr. A. E. Flowers discusses some experimental observations on crystalline rectifiers and as a result of his investigations concludes that the rectification effect of that class of detectors is probably due to the electrochemical formation of a high resistance film at each alternate reversal of current. If Mr. Flower's conclusion is correct, the crystal rectifier bears a close analogy in respect to the principle of its operation to an electrolytic rectifier consisting of aluminum plates immersed in a suitable electrolyte.

A very compact type of combination wireless telegraph receiver is being installed upon the newer ships of the United States navy and at many of the shore stations. Results obtained in receiving with the new type of instruments have been very satisfactory, the "North Carolina" while returning from the Taft celebration at New Orleans recently being in communication with the Norfolk Navy Yard while at the mouth of the Mississippi and with Chicago, while off Charleston, South Carolina. Two detectors are used; a perikon and a pyron or silicon, the perikon being used for long distance work and the pyron or silicon for receiving from stations near at hand.

Old Timer's Year Book.

The printed report of the proceedings of the annual reunion of the Old Time Telegraphers' and Historical Association and the Society of the United States Military Telegraph Corps which occurred at Pittsburg, August 16 to 19, is now being distributed among the members. This is by far the best report ever prepared of an annual meeting of these two organizations and the secretary Mr. F. J. Scherer of 195 Broadway, New York, is to be congratulated upon the excellent appearance of the report and the very creditable manner in which it is arranged. Great credit is also due to Mr. A. C. Terry of Pittsburg in providing the many excellent views of Pittsburg used to illustrate the work and also for preparing the covers. The front cover has an artistic design and handsomely embossed lettering. On the back cover is embossed the badge of the reunion. The book is bound with a yellow and black silk cord, the Pittsburg colors. The printing, which was done by the James Kempster Printing Company of New York, is a worthy example of the printer's art. Taken as a whole the book is a souvenir which any old timer may well be proud to possess.

Trade Note.

Bulletin No. 117, issued by the Electric Storage Battery Company, deals with the subject of storage batteries in signal and car lighting service, their installation, care and operation, being an abstract of a paper upon this subject, read by Mr. H. M. Beck at a meeting of railway signal, car lighting and telegraph engineers, held in Chicago September 23. A brief abstract of this paper appeared in our November 1 issue.

Heroes of the Telegraph Key.

Everybody's Magazine for December has an interesting article entitled "Heroes of the Telegraph Key," by A. W. Rolker. While some of the stories related are highly overdrawn, the incidents upon which they are founded are acts of true heroism which reflect honor upon the profession. Among others which are worth repeating is the story of Richard Spillane, the well-known old-time telegrapher who is now editor of the New York Sunday Press, and the heroic part which he played in spreading the news of the Galveston disaster. The story reads as follows:

"Most striking, when a community is overwhelmed by disaster, is the absence of grief or lament. Terror, driven to an extreme, benumbs the human brain and is turned into apathy. So it was in Galveston on the morning of September 9, 1900, when, after a night of inferno amid tidal wave and hurricane, survivors emerged from their homes to see what was left of their ruined city. Thirty thousand dazed, helpless men, women, and children huddled about six thousand human bodies sprawled among the wreckage of houses piled twenty feet high.

"The weakest would die of shock and exposure and disease and pestilence unless prompt aid arrived. Within fifty miles of these sufferers was help in abundance—food, drink, clothing, shelter, and medical attendance, which could be rushed fast as steam could race if neighbors only knew. But wires were down. Bridges to the mainland were gone. Railroads were no more. Steamships had been floated on the tidal wave and swept high and dry, miles across country. Every hope of communication was gone.

"The man who crossed those fifty miles and flashed the news which within two hours started races of relief ships from many ports in the country, was Richard Spillane, a former telegraph operator whose expertness at the keys is famous among old-timers to this day. Wracked, un-nerved, and limp with the horrors of the frightful night when the hurricane raged, when a hundred times his house was on the very verge of toppling over, when for ten hours he stood among his three children with his arm about his wife's waist, resolved to swim with her and go down locked in her arms, Spillane ventured forth at dawn.

"Galveston, the beautiful semi-tropical city of snowy cottages and green lawns, was razed so that he could see the seething waters of the Gulf. Houses he saw smashed into each other and piled high in the streets, mangled bodies lying among thousands of dead animals. Coffins he saw with bodies long since buried that had been gouged out of the very cemeteries and had smashed open, strewing their ghastly contents. Over everything lay a three-inch sog of disease-breeding filth. Worse, as he saw the first human creatures, he realized that he was in the city of

the mad. Hardly a man over forty but had been driven temporarily insane.

"Head bowed, ashen of face, Galveston's mayor, Walter C. Jones, came toward Spillane. 'My God, Dick, this is terrible, terrible!' he said in a voice choked and broken. 'We're cut off as if on an island in the Pacific, and before night thirty thousand will be starving. What under heaven can we do?'

"Spillane up to this time had himself wandered as if in a half dream, but at the question the telegraph operator, who for years had sat taking messages of disaster by land and sea, awoke. 'Do, man? Get into communication with the outside world somehow, quick: s heaven will let you. Give me a requisition to impress anything or any one I want into my service, and I'll show you what to do.'

"Within an hour Spillane was aboard the Pherabe, a powerful thirty-foot launch, and had set forth to cross Galveston Bay to the mainland, and to follow the railroad track on foot for Houston, forty-seven miles away. But the bay was a seething turmoil that ran house-high. For two hours the launch fought, covering a bare seven miles abreast of the mainland; but nowhere along shore could Spillane see a place to land. Wreckage of houses, barns, ships, railroad trains littered the shore far as the eye could reach. Off what had been Texas City, Spillane realized he would have to hit or miss, and ran full speed ahead at the shore, fetching up in a heap of debris.

"All he could find of the railroad was the right of way. Ties were gone. Seventy-pound steel rails lay bent and twisted like hairpins and corkscrews, and telegraph poles were razed clean as if cut off with a buzz saw. Through knee-deep water and ankle-deep mud he slipped and floundered. The hot sun beating through the murk of the sweltering calm that had followed the storm, baked him as if in a kiln, until he was mad with thirst; but in the midst of that watery desolation there was not a drop of water fit to drink, for the brine of the Gulf had flooded streams and wells. His feet were covered only with felt slippers, and dye had soaked out of these, poisoning his ankles until they were as if on fire and swollen big around as saucers. But he trudged on all day, mile after mile, now climbing heaps of debris, now swimming streams where bridges and culverts had been swept away, until by sundown, within sight of Houston, he was ready to drop in his tracks with exhaustion.

"Yet he staggered into Houston that evening—head bent, shoulders sagging, arms dangling, in his brown eyes the uncanny gleam of a human being driven beyond endurance. A ghastly figure he was, clad in an undershirt, linen trousers, and an outing cap, bare legs swollen to the size of watermelons. With eyes like burnt holes in a woolen blanket the man stared, his face of the gray white one sees when the blood recedes from an olive complexion.

"Galveston is gone! Galveston is gone!" he

mumbled thickly as he limped through the streets toward the telegraph office, followed by a crowd. 'Any wires working?' he gasped. He sank into a chair in front of a desk, and the magic fingers that had sent the quick, clear, even, incisive Morse for which even to-day this man is famed, grasped the knob of a telegraph key and called up St. Louis, where President McKinley happened to be. This was the message:

President McKinley,

St. Louis, Mo.:

A hurricane and tidal wave destroyed Galveston. At least ten thousand are dead in Galveston and surrounding country. Twenty to thirty thousand are homeless. We need food, clothing, tents, doctors, drugs, and—above all—disinfectants.

"Then, presently, came a moment when Spillane did that for which Congress owes him a medal. A New York sheet had been tipped off that Spillane had arrived with one of the biggest stories in a generation, and a brazen editor thought he saw his chance for a beat. He sent this message to Spillane:

"The — offers you \$5,000 for exclusive story of Galveston disaster.'

"Five thousand dollars! What was not \$5,000 to a man unnerved, unstrung, a man thirty-six years old, on the threshold of beginning life all over again, with a wife and three hungry little ones to feed! For a minute Spillane sat, face flushing. Then the blood receded and out of his brown eyes snapped a spark, and under his black mustache the teeth came together with a click.

"Impossible,' he answered simply.

"Name your own price,' came the answer.

"I am not selling the lives of thirty thousand human creatures at any price. My first duty is toward them.' Within ten minutes, into the office of the Associated Press Spillane clicked the story, without writing a word of copy—in itself a marvelous telegraphic feat. Almost word for word as he sent the story, so it sped throughout the country to the hundreds of papers in the Associated Press Service; and how the country responded, how at first warships and then trainloads and shiploads of assistance were rushed from every port and point, is a matter of history."

We are in receipt of an attractive brochure from the Port Arthur Business College of Port Arthur, Texas, outlining the courses which this school gives in Commercial Accounts, Telegraphy and Telegraph Engineering, Stenography and Typewriting and Spanish. The course in Telegraph Engineering includes careful instruction in the theory, adjustment and maintenance of all apparatus used in telegraph operation. The student is given thorough instruction in Morse telegraphy with special regard to style and technique in sending and receiving clear-cut Morse. Mr. Louis Casper the head of the telegraph department is not only a telegrapher of highest grade but one of the most accomplished and best educated telegraph engineers in the country.

The Military Telegrapher in the Civil War.

PART XXXII.

One of the most noted operators connected with the Southern cause during the Civil War was George Ellsworth, commonly known as John Morgan's operator. Many of the telegraphers employed in the United States Military Telegraph service had personal encounters with this famous operator over the wire, and some of them grew so accustomed to his sending on the many occasions when he had tapped their lines that they would recognize his touch the moment that he cut in on one of their wires. Among those who had especial occasion to remember Ellsworth was E. W. Atwater. In an interesting letter which he wrote to Colonel William R. Plum, historian of the United States Military Telegraph Corps in 1878, Mr. Atwater, whose death occurred in May, 1905, related an interesting story of his connection with the Military Telegraph service and of a personal encounter with Morgan's famous operator. Mr. Atwater's story in part is as follows:

"Having tendered my services to the United States Military Telegraph authorities, I received orders from Captain Samuel Bruch on June 7, 1863, to report for duty. Arriving at Louisville on the evening of June 10, I was the next morning given instructions to proceed to Lebanon Junction, Ky., a station on the Louisville and Nashville Railroad, thirty miles south of Louisville. I was there assigned to handle the night work, it being a repeating office for military posts in southeastern Kentucky. The army had passed through Kentucky, gained the victory of Stone River, Tenn., and made Winchester their headquarters, leaving a rear guard to protect the bridges. That part of the State was swarming with small bands of guerillas and bushwackers, and Lebanon seemed to be one of their rendezvous. On the evening of July 3, W. R. Bennett, the operator at Lebanon, invited me to spend the Fourth with him. I had just received from the North a new telegrapher's uniform, and thinking it would be a good opportunity to show it, accepted the invitation, and resolved to take the 8.30 train for Lebanon the following morning. About 10:00 p. m. the line between Lebanon and Lebanon Junction opened and remained so until 6:00 a. m. the next day. When the circuit closed, I called Lebanon and, receiving an answer which I supposed was from operator Bennett, passed the time of day with him, and upon his asking me if there were any guerillas reported near Lebanon Junction, I told him that it was said that there were a few scattering ones seen in the country the day before, but that I thought it was a false rumor, and everything was then quiet. I told him I would be at Lebanon about noon and asked him if he could give me something to eat. He replied to come along, that he would have two cool drinks and two square meals ready.

"At seven o'clock the day operator relieved me, and, after eating my breakfast, donning my new uniform and putting my new Colt's revolver in

my pocket I boarded the train for Lebanon. There were about thirty passengers on the train, five of whom were ladies. Before leaving I asked the operator at Lebanon if everything was all right and he said that it was. We were soon on our way, and I was thinking about the cool drink and the square meal with my friend Bennett which was awaiting me at the end of my journey. Arriving at New Hope we were informed that the guerrillas had destroyed a culvert and torn up the track near St. Mary's, five miles from Lebanon. We accordingly took on a guard consisting of twelve privates and a sergeant and I was sitting on the soft side of a box in the express car reading the Louisville morning paper when suddenly our engine left the rails and began bounding over the ties. The train was soon stopped without any serious damage, but as soon as it had halted was fired upon by a band of about thirty guerrillas and one of the soldiers killed and several wounded. Using the cars for protection the remaining soldiers soon drove the enemy away and started in pursuit of them. The express messenger and myself seeing some Confederate soldiers on the track not far ahead of us feared that we would be attacked in the absence of our guard, and he persuaded me to take a circuitous route to the rear to the nearest post for aid.

"Jumping from the car door, I found myself in a forty-acre meadow, in the center of which was a hay stack which I hoped to reach in safety. I had not proceeded far when, looking toward the road, I discovered three Confederates mounted and well armed rapidly approaching me. As there was no chance for me to escape, I extended the Louisville Journal, which I had been reading, in token of surrender, and the three riders soon came up to me. They asked me several questions about the people who were on the train, who I was, where I was going, etc. Upon telling them my name, one of the men informed me that he was George Ellsworth, John Morgan's operator, and that it was he with whom I had been talking over the wire that morning and who had invited me to come to Lebanon to see him. Trying to make the best of a bad situation, I walked up to him and said 'I congratulate myself that I have fallen into such good hands. If I must be a prisoner I am glad that my captor is an operator. I am tired, hungry and dry. Let us take those good cool drinks.' 'All right,' said he, 'we will do so a little later,' and so saying, he placed the muzzle of his gun within an inch of my head and ordered me to surrender my new revolver. He then told me to follow him. Upon my remonstrating, on the ground that I was neither a private soldier or an officer, he said, 'What are you doing with that uniform on? It resembles that of an officer.' Thus, the uniform which was my pride was now the cause of considerable inconvenience to me. They then started for the train, I following in the rear, but they had only gone a short distance before they sud-

denly turned their horses and started at full speed in the opposite direction, paying no attention to me. The reason for this was that a company of Union cavalry, out on a scouting expedition, had heard the sound of firing at the train, and came to investigate. They followed in pursuit of my captors, but without overtaking them. By connecting the ends of the broken wire near where the train was wrecked I was enabled to communicate to the operator at Lebanon Junction the condition of our train, and instructed him to notify headquarters at Louisville. An order being sent from there for an engine to come and take us back to Lebanon Junction, I arrived at that point about 11:00 p. m.

"The next morning Morgan with his brigade entered Lebanon, surprising and capturing the entire Union force stationed there. My friend Bennett, however, made good his escape, taking with him his telegraph instrument and his repair tools. At night Morgan's command leaving the city, Bennett, who had hidden in a muddy trench in the suburbs, connected his instrument to the wire and reported the movement of the enemy to General Boyle at Louisville.

"Morgan's command then continued their march toward Lebanon Junction, and, being informed of their movements, I began to fear that I might be captured again. Six miles north of where I was located the railroad crosses South River by a bridge. A stockade had been constructed at this point and garrisoned by a small force to prevent the destruction of the bridge. Half a mile further north was Bardstown Junction. This station was under the charge of James Forker who was all alone at that point. Morgan sent his advance guard, consisting of Ellsworth and his two companions to interview Forker, who was on duty in his office. They took him by surprise and appropriated his hat, coat and boots. While they were talking to him, the train for Louisville arrived at Lebanon Junction. I reported the departure of the train and waited to hear of its passing the bridge. While waiting I noticed a bright illumination in the sky at the north, and later found that Morgan had fired the bridge and captured the train. Suspecting that something was wrong I asked Forker if the train had passed the station. Ellsworth, who stood by him with drawn revolver, ordered him to say that it had. He then told Forker to follow him in the march towards the Ohio River. He soon escaped, however, and the next day came walking into my office, minus hat, coat and boots.

"I was soon after transferred from Lebanon Junction to the Department of the Cumberland, with instructions to report for orders to Captain J. C. Van Duzer, quartermaster and superintendent at Nashville. On my arrival at Nashville, I was sent to Estelle Springs near Elk River. After remaining here a short time I was ordered to Anderson in advance of the army headquarters to open an office in that place. On my arrival there I soon communicated with Nashville on the north and Bridgeport on the south, and with the

assistance of some soldiers constructed a temporary table for my instruments out of an army shoe box, and was soon ready for business.

"The night after the battle of Chattanooga, when the issue of that battle was still in doubt, Superintendent Van Duzer, who was in Chattanooga expecting at any time to be captured, telegraphed the situation to his clerk, giving him instructions to carry out in case he was captured. I had been at my post of duty day and night while the battle was pending receiving orders for supply trains. Worn out and exhausted I had laid down to rest within hearing distance of my instrument. Scarcely had I closed my eyes when I heard a voice saying, 'Come, boy, get up, the enemy have driven in my pickets. I expect an attack every moment.' Jumping up, I saw the captain hurriedly forming his men in line. I asked him for a musket so that I could help out in case of an attack. He said, however, that he wanted me to stay in the telegraph office so that I could send word to Stevenson for reinforcements in case he was defeated. We waited the remainder of the night for the expected attack, but no enemy appeared. Nothing of any great importance occurred while I was at Anderson, and after the battle of Nashville the rebellion being practically crushed in that locality, and tiring of my position, I tendered my resignation and returned home.

"Soon after, however, I received instructions to take charge of the office at Richmond, Ky. I remained here until the close of the war, witnessing many stirring events incident to family feuds, political differences and guerrilla warfare. In fact, I was ordered to this place to relieve an operator whose nerves were not sufficiently strong to stand all of the excitement. On the fourteenth of December, 1865, I received my final discharge and severed my connection with the Military Telegraph service."

General Mention.

Mr. J. D. Voltz, an old time and military telegraph operator who has served the Chicago and Northwestern Railroad for twenty-five years at South Elgin, Illinois, and who has been actively engaged in the telegraph service for fifty-five years, was retired recently on a pension having passed the age of seventy. A remarkable fact about Mr. Voltz's career is that he has never earned a dollar except by his work at the key.

Denison, Texas, has two of the youngest telegraph messenger boys in history. They are William Joseph Thorp and Harold Hussey, each aged five. Manager H. E. Gordon of the Postal Telegraph-Cable Company of Texas advertised for two live messengers and the two youngsters applied early next morning. He became interested in the enterprise of the lads and put them on and they were soon in possession of blue suits and caps. There have been no complaints as to tardy deliveries since they have been in the service.

Obituary.

Lewis M. Owings, a well-known telegrapher of Columbus, Ohio, died in that city December 3, aged fifty-eight years.

Mrs. Martin, wife of T. Comerford Martin, secretary of the National Electric Light Association, died November 25, after a painful illness extending over several years.

John B. Twiford, a well-known old-time telegrapher, of Omaha, died November 23 of paralysis, aged fifty-eight years. Mr. Twiford was manager for the Western Union Telegraph Company at Ogden, Utah, from 1890 to 1900, when he became manager at Salt Lake City. He was well known throughout the West, and was held in high regard by all who knew him.

E. E. Cord, chief operator of the Postal Telegraph-Cable Company at New Orleans, died November 28, aged forty-three years. Mr. Cord had been in poor health for several months and had been advised by the doctors to take treatment at Hot Springs, Ark. Deriving no benefit from the baths at that place he was on his way back to New Orleans when his condition became so serious that he was obliged to stop at Memphis, where he died a week later. After taking a course at the Massachusetts Institute of Technology, Mr. Cord entered the service of the Western Union at Chicago. He served that company at various points, and in 1903 was made chief operator at New Orleans, being transferred to that city from a similar position in Memphis. He resigned three years ago to enter the telephone service, but soon after accepted the position of chief operator for the Postal. Mr. Cord was well known in telegraphic circles. He was always a close student and was considered an expert in matters pertaining to telegraph engineering.

Book Review.

"How Telegraphs and Telephones Work," by Charles R. Gibson (Seeley and Company, London, 156 pages, illustrated,) is a description in non-technical language of electrical phenomena, which are made use of in the operation of the telegraph and of telephones. The author gives a simple explanation of the general principles of electricity and presents an interesting narrative of the way the telegraph was invented. Included in the book are chapters upon submarine telegraphy, wireless telegraphy, the principles of telephony, wireless telephony, the construction and operation of an induction coil, lightning, the meaning of the electrical units in every day use, waves in the ether and a discussion of the nature of electricity. Being entirely free from mathematical formulae and abstruse theory, this book can be read with interest by the beginner in the study of electricity and telegraphy and will, as intended by the author, be of great value to the student. Price, \$1.00. Copies may be obtained by addressing J. B. Taltavall, Telegraph Age, 253 Broadway, N. Y.

The Robert W. Martin Fund.

Since the last acknowledgment a month ago of contributions to the fund for the assistance of R. W. Martin remittances have been coming in very slowly. There are several who have signified their intention of subscribing to the fund, but who have delayed doing so. To these the committee would suggest that the Christmas season now at hand is a most fitting time for them to contribute good cheer to one of their stricken brothers who is in need of their help.

The committee in charge of the fund consists of J. B. Taltavall, of Telegraph Age; Charles W. Price, of the Electrical Review; T. Comerford Martin, of the National Electric Light Association, and T. A. McCammon and Fred Catlin, of the Western Union Telegraph Company. All contributions should be addressed to J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

There can be no harm in stating now, that Mr. William M. Laffan, the owner of the New York Sun, who died after an operation for appendicitis, November 19, was the donor of the \$100 which swelled the R. W. Martin fund so perceptibly, as related in our November 16 issue, credit being given at the time to "A Friend" through Walter P. Phillips."

John Perley Munroe, of Worcester, Mass., whose name is inseparably connected with those other great telegraphers, Oscar Willis, Patrick B. Delany, Patrick Henry Burns and his successors, in sending \$5.00 for the fund, says: "I enclose a small check for Bob Martin. I am sorry it is not larger. I remember him very well, and as a boy looked up to him as one of the shining lights of the profession."

The amount received to date is: Previously acknowledged, \$556.25; Ralph D. Blumenfeld, London, England, second remittance, \$5.00; J. P. Munroe, Worcester, Mass., \$5.00; total, \$566.25.

Holiday Gifts.

Now that the holiday season is at hand thoughts naturally turn to the consideration of Christmas gifts for friends. With most people the selection of a suitable gift is one of the hardest tasks which they have to perform in the entire year. One naturally wishes to give his friends something which they do not have already, something which they will appreciate and which will be of use to them and something which they will be able to keep as a remembrance. Nearly every one appreciates the gift of a good book, and as for usefulness there is nothing which can be given which will be of more lasting value to the recipient. In this connection we call attention to the fact that Telegraph Age is headquarters for books of all kinds. We have in our catalogue a carefully selected list of books, many of which would be most acceptable as holiday gifts to those interested in telegraph, telephone and electrical matters, and we will be glad to supply any of these to those who desire to make a gift which will be appreciated.

LETTERS FROM OUR AGENTS.

BRIDGEPORT, CONN.

Among recent visitors were Miss Katherine Graham, of the Crane leased wire, New York, and her sister, Miss Mae, of the Postal force, who enjoyed a week-end visit with Miss A. Nolan. Through the kindness of Mr. F. J. Mulcahy, president of the Crane Company, and an old time telegrapher, his touring car was pressed into service and the girls enjoyed a ride in the country before their return to the metropolis.

PHILADELPHIA, POSTAL.

F. E. d'Humy, assistant electrical engineer, was a recent visitor, coming here on business in connection with the service.

William Hopkins, branch manager at 103 North Front Street, has returned to duty after an illness of two months.

Morris Ruberg, for a long time connected with this office in various capacities, has resigned to accept a position with the American Telephone and Telegraph Company in Philadelphia. Mr. Ruberg was also agent for Telegraph Age. He has the best wishes of his many friends for success in his new line of endeavor.

The interests of Telegraph Age will hereafter be looked after by F. P. McElroy, assistant wire chief.

Miss Mary Moore of the telephone room is absent on account of illness, and is in a very serious condition.

All makes of typewriters \$10 up to \$55. Rentals \$2 and \$3 monthly. ALL rental applies on purchase. Rebuilding and repairing at moderate prices. Central Typewriter Exchange, 203 Broadway, New York.

OTHER NEW YORK NEWS.

Mr. M. H. Kerner delivered a lecture on the "Historical Progress of the Telegraph" at Public school 159 New York City under the auspices of the Board of Education on Monday evening, December 13. Quite a number of telegraph people were present. His story included a description of the Barclay and also the Telepost systems.

A lunch room for the messenger boys has been opened in the basement of the Postal Telegraph-Cable Company's building, 253 Broadway, where pies, cakes, sandwiches, coffee, etc., can be obtained by the boys at lowest prices.

In a letter to the Serial Building Loan and Savings Institution, 195 Broadway, N. Y., dated October 20, the New York State Banking Department says: "We are pleased to note the steady improvement in the affairs of the corporation." The business of this Association is conducted under the supervision of an exceptionally conservative board of directors, composed almost entirely of telegraph men. Write for particulars.

Advertising will be accepted to appear in this column at the rate of fifty cents a line, 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.

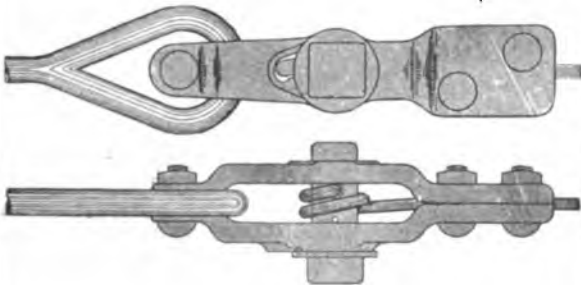
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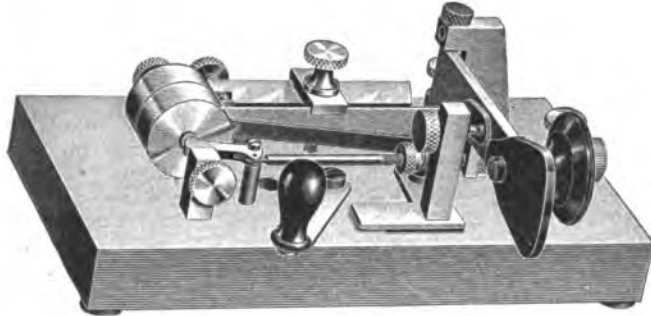
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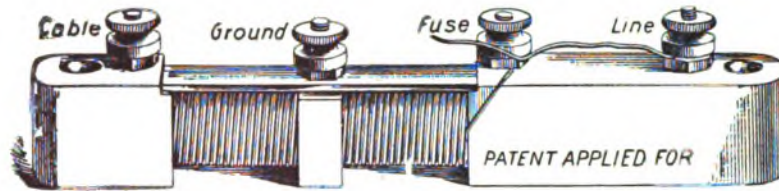
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