TELEGRAPH AGE

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

Office of Publication: 253 BROADWAY, NEW YORK

ESTABLISHED 1883

Single Copies 10 Cents { For Yearly Subscription Rates See Editorial Page

No. 9. NEW YORK, MAY 1, 1909. Whole No. 623

Some Valuable Telegraph Books.

All of the books described in the following list embody a choice number from which selections may advantageously be made, and furnishes an excellent catalogue for the consideration of telegraphers desirous of selecting suitable books for study. Any book named will be sent upon receipt of price to any address, carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York:

POCKET EDITION OF DIAGRAMS.

"Pocket Edition of Diagrams and Complete Information for Telegraph Engineers and Students" is acknowledged on all sides to be the standard work of the telegraph. Speaking strictly within bounds, it is not too much to say that this volume presents the finest study of the complex subject of the telegraph ever attempted. There is no other book like it or even approaching it, in thoroughness, comprehensiveness, or in original detail of statement. The author, Willis H. Jones, is a practical telegrapher himself—an engineer in his profession of recognized ability, who knows exactly what other telegraphers want to know, and has the faculty of imparting that knowledge in a manner at once so clear, so simple, so bright, so entertaining, so free from needless technicalities, that his readers, even the least informed among them, readily understand his meaning. The helpful qualities of the work will be clearly manifest alike to the beginner, to the student, to the operator and to all telegraphers whether in the commercial or in the railroad service.

"Pocket Diagrams" does not deal in theory; it is packed full from cover to cover of the common sense of telegraphy, the side which the ordinary every day operator runs up against, and respecting which he desires information of the kind that will aid, not mystify, him. The book contains 334 pages, and has 160 splendid diagrams. It has the unqualified endorsement of telegraphers everywhere.

The price of "Pocket Edition of Diagrams," etc., is $1.50.

PHILLIPS CODE.

The popularity of the Phillips Code, by Walter P. Phillips, was never more apparent than at the present time. Its acceptance by the telegraphic fraternity, as a standard work of the kind, dates from its first publication, and the constantly increasing demand for this unique and thoroughly tested method of shorthand arranged for telegraphic purposes, has necessitated from time to time the issuance of several editions. The present edition was carefully gone over under the supervision of Mr. A. P. Velie, an expert press and code operator, for many years identified with The Associated Press, New York, a few revisions made and a number of contractions added, until now this "stanch friend of the telegrapher" is strictly up-to-date in every particular. It has been declared that an essential qualification of a "first-class operator" was a thorough understanding of Phillips Code.

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.

"Telegraphers of To-day," illustrating the personnel of the telegraphic profession, as it existed in 1894, with more than 900 biographical and historical sketches of leading members of the craft, is a unique and valuable work; it has become standard, being the only work of the kind extant. It contains 354 double-column pages 7 x 11 inches in size, has gilt edges and is bound in imitation morocco.

Of this fine publication, becoming more and more valuable as times passes, we have but a few copies left. The original price was $5. In order to readily dispose of these remaining volumes, and place them where they rightfully belong, in the hands of every telegrapher who failed to secure a copy at the higher original price, we have cut the figure to $2 a volume, express charges prepaid. At this low rate, a sum about the cost of binding the book, no telegrapher who desires to own a copy should fail to obtain one at this time, for this "bargain" price will probably never be repeated.

The life of Prof. S. F. B. Morse, is the standard work, authorized by the Morse family, and compiled from original papers and other authentic data in their sole possession. It is a clearly written biography, charmingly told by a trained newspaper man, a close personal friend, and presents the life of this great inventor of the telegraph in a broader, more intense, human and truthful attitude than ever before attempted or even made possible; 775 pages, illustrated; sheepskin binding. The original price was $6, which we have reduced to $3, on receipt of which the book will be sent, express charges prepaid.

"The Telegraph in America," by the late James D. Reid, the "father of the telegraph," furnishes an authentic and complete history of the telegraph, tracing out its early start, its development, the organization of the various telegraph and cable companies, etc. The book is bound in full Russia, has 846 pages and is abundantly illustrated; a magnificent gift to any telegrapher. There are now but a few copies left of this great work and when these are gone the work will be out of print. The original price was $7, but as the covers are a little shopworn the price has been reduced to $5.

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

"Lightning Flashes and Electric Dashes," a book made up of bright, ably written stories and sketches, telegraphic and electrical, that should find a place in the home of every telegrapher; 160 large double-column pages; profusely illustrated; price reduced from $1.50 to $1.00 per copy.

Old Timers' Souvenir—Miniature Legless Key. This is a beautiful emblem for operators; an attractive charm for the watch chain; a perfect duplicate in every detail of the celebrated miniature steel lever telegraph key that attracted so much attention and which was distributed as a souvenir at the banquet of the Old Time Telegraphers' and Historical Association at the Waldorf-Astoria, New York, August 31, 1905. It has a French lacquered body and nickel-plated lever. Price, by registered mail, prepaid, $1.50.

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.

By taking a little trouble, when TELEGRAPH AGE first comes to hand, it may be preserved to form a permanent and valuable addition to the reading matter of a kind which all telegraphers should be supplied. We furnish a neat and attractive cloth board binder, which will be sent by mail, prepaid, for $1. It has good, strong covers, on which the name TELEGRAPH AGE is stamped in gold, and means by which each issue may be securely held as in a bound book. One binder may thus be made serviceable for a number of years, and when successive volumes, as they are completed, are bound in permanent form, the subscriber ultimately finds himself, for a moderate cost, in possession of a most valuable addition to his library, embracing a wide variety of telegraph, electrical and general information.

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The price of "Pocket Edition of Diagrams, etc.," is $1.50. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

Thom & Jones' Telegraphic Connections. 300 pages, illustrated by 20 plates with circuits distinguished by three different colors. Price, $1.50, postage prepaid. Address J. B. Taltavall, Telegraph Age 253 Broadway, New York.

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

LIGHTNING FLASHES AND ELECTRIC DASHES.

This is a book made up of bright, ably written stories and sketches, telegraphic and electrical, that should find a place in the home of every telegrapher; 160 large double-column pages; profusely illustrated. Price $1.50. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

TELEGRAPH AGE

No. 9. NEW YORK, MAY 1, 1909. Twenty-sixth Year.

CONTENTS.

SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

The Telephone.

PART III.

The student having acquired a general knowledge of the construction and principles involved in telephone operation from the preceding instalments of this article, should next endeavor to trace the wires within the conventional box containing the telephone paraphernalia in order to learn how the bellringer, receiver, battery and other parts of the local outfit are arranged and so connected that they are shunted out of service when not required. These latter connections, of course, are all made permanent and boxed up before the outfit is delivered, but it is well to understand what is within even if one cannot see these connections.

The complete connections may be seen in the lower half of the accompanying diagram, Figure 1. When the receiver is hung on the hook end of the lever shown, the latter breaks contact with the three metallic disks, 1, 2, and 3, thereby opening the circuits containing the telephone, induction coil and the transmitter, and disconnects them from the line. The depressed lever, however, through its new contact with the bottom disk then closes the line circuit through another route as shown by the dotted lines, which connect the bellringer and the generator in the circuit.

The generator and bell are shown more in detail in the upper portion of Figure 1. The former is practically a small dynamo possessing a field due to the permanent magnetism in the steel horse shoe magnets and its armature is revolved by means of a crank instead of a belt. It sends al-

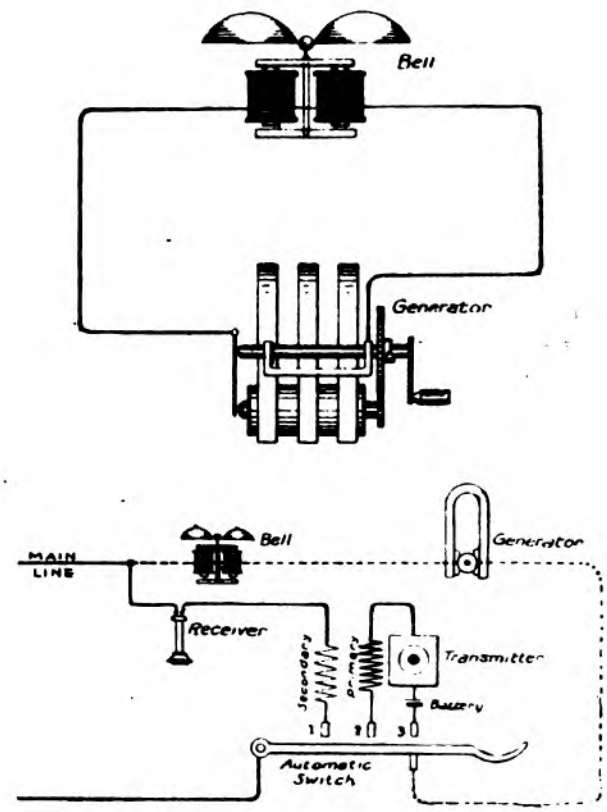

FIGURE 1.

ternating currents into the line when the crank is turned rapidly, which give the armature of a polarized magnet at the station called a to and fro movement, and thus causes it to play between two bells which it strikes alternately. Owing to the high electromotive force the generator creates and the sensitiveness of the polarized magnet, the bell signals may be sent great distances without any difficulty.

The generator, being wound to 1,000 ohms or more should obviously be eliminated from the circuit except when actually in use for calling.

For this reason the shaft connection is so constructed that when the crank is not being turned the coils are shunted.

As stated in the previous instalment, ground return circuits should always be avoided when possible, or rather practical, in order to prevent the picking up of foreign noises. But for short distances in isolated places a single conductor grounded at each station gives satisfactory results and saves the expense of the copper for a return wire.

The principal objection to installing telephone connections between places very short distances apart where the services of the telephone would not be required very often, is the cost of a complete outfit. This may be remedied somewhat by constructing the circuit in the unique manner shown in Figure 2, whereby the generator and carbon transmitter may be discarded altogether, leaving nothing but the two receivers, the small bells and a few cells of battery to be installed.

In this arrangement, which, we will assume, represents a circuit extending between a residence and the coachman's quarters in the stable, the grounded three-point switch levers are kept permanently on the left hand disk when the circuit

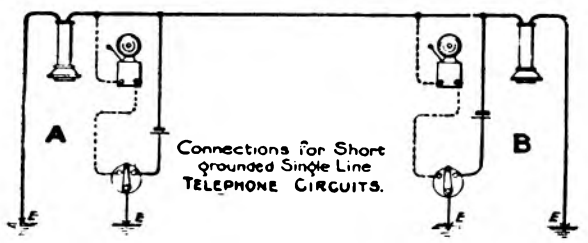

FIGURE 2.

is idle. This position grounds both terminals of the line through the bell circuits and disconnects both batteries. Should the party at A wish to converse with B, he simply turns the switch lever to the right. This connects his local battery to the line and causes the bell at B to ring, as the current nearly all goes through the latter's coil rather than through the greater resistance of B's telephone coil. As soon as A thus signals to B he immediately turns his switch lever to the left again in order to connect his own bell in circuit so that he may hear B acknowledge the call by a similar operation at his end. Having thus signaled one another, each places the switch lever midway between the disks so as to leave that route open, and then use the receivers as both transmitter and receiver during the exchange of conversation.

(To be continued.)

Recent Telegraph Patents.

A patent, No. 916,918, for an electrical circuit breaking and making device for telegraphic purposes has been taken out by Charles E. Davies, of Ottawa, Ontario, Canada. Combined with a tiltable armature, and magnet for operating it, is a spring lever having the end adapted to be engaged by the armature in its movement toward the magnet.

A patent No. 917,011, for a printing telegraph, has been granted to A. C. Crehore, of Yonkers, N. Y. A series of magnets at the receiving station are actuated by a typewriter at the sending station and operate the keys of the typewriter at the receiving station. Improvement on the prior system of the same patentee.

A patent No. 917,263, for a telegraph-repeater, has been issued to Charles E. Davies, of Ottawa, Ontario. Combined with the main lines are compound electromagnets and auxiliary circuits including a winding of the magnets and controlling armatures, means operated by the movement of each armature for simultaneously breaking the auxiliary circuit that energizes the magnet controlling the opposite armature.

A patent No. 918,109, for a polarized relay, has been awarded to P. Ribbe, of Halensee, near Berlin, Germany. A polarized relay for currents of micro-voltage or micro-amperage. Makes use of a permanent magnet with field coils and a rectangular frame carrying the armature of superposed plates of soft iron.

A patent No. 918,291, for a keyboard transmitter for Morse and other telegraphic codes has been secured by P. B. Delany of South Orange, N. J. When a key is depressed devices are operated which automatically effect the transmission of dots and dashes.

A patent, No. 918,292, for telegraphy has been granted to P. B. Delany of South Orange, N. J. An electrochemical telegraph in which the capacity on the line is used to complete the signals.

A patent, No. 918,293, for telegraphy has been issued to P. B. Delany of South Orange, N. J. The transmission of dot signals is effected by the combined use of two or more electromagnet devices, the first one when the key is depressed closing the circuit to be charged and the last one breaking the circuit.

A patent, No. 918,294, for an autodot transmitter has been awarded to P. B. Delany of South Orange, N. J. A loosely mounted sliding impact weight is set into motion by the armature lever to make the dots.

A patent, No. 918,322, for a telegraph system has been taken out by G. E. Hines of New York. A duplex telegraph which can also be used as a quadruplex. Uses two sources of current, one for sending induced impulses and the other for sending continuous current impulses.

The following patents have expired:

Patent No. 472,237, for a unison apparatus for printing telegraphs, held by H. Van Hoevenbergh of New York.

Patent No. 472,326, for an automatic telegraph, held by F. Anderson of Peekskill, N. Y.

Personal.

Mr. F. G. Boyer, superintendent of telegraph of the National Transit Company, Oil City, Pa., was a recent New York visitor, coming to the metropolis on business connected with the service.

At the meeting of the Electric Club of Chicago on April 21, Mr. B. E. Sunny, president of the Chicago Telephone Company, who is not only a representative electrical man, but a public-spirited citizen as well, addressed the club on the subject "Chicago Charter Bills." Mr. Sunny has devoted much attention to this subject, and owing to this fact and to his prominence in the industry a large attendance was present to show their appreciation of the good work accomplished by him toward the improvement of the city management. The electrical fraternity, including the telegraph, of which he was once a prominent member, is proud of the distinction that has been earned by Mr. Sunny in his efforts to improve economic conditions in large cities.

Mr. Thomas B. Doolittle, prominent in telegraph circles until the advent of the American Telephone and Telegraph Company, of which he has for many years been special agent at Boston, Mass., has retired from active service, and a dinner will be given to him by his many friends and associates at the St. Botolph Club, Boston, on May 4. Mr. Doolittle is the inventor of the process of making hard drawn copper wire, of the Doolittle switch and many other useful inventions pertaining to the telephone and telegraph industry.

A complimentary dinner was given to Colonel William Bender Wilson on his retirement from the Pennsylvania Railroad Company's service on April 20 at the Hotel Majestic, Philadelphia, by two hundred of his fellow officials and friends. Colonel Wilson has been identified with the Pennsylvania Railroad Company for fifty-three years and six months, honored by everyone in the service, and he retires with the good wishes of all. A letter was read from Andrew Carnegie testifying to the excellent work rendered to the government by Colonel Wilson during the Civil War and regretting that on account of going abroad he could not be present to share in honoring him. The Society of the United States Military Telegraph Corps, of which Colonel Wilson is president, was represented at the dinner by many of its members.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mr. Charles P. Bruch, vice-president of the company, who is convalescing from an attack of typhoid fever, is at Atlantic City, N. J., where he will remain for a few weeks for the benefit of his health.

Among the recent executive office visitors were: Mr. Wm. J. Camp, electrical engineer Canadian Pacific Railway Company's telegraphs, Montreal; Mr. George H. Usher, general superintendent of this company at Atlanta, Ga.; Mr. Charles E. Bagley, superintendent at Philadelphia; Mr. A. L. Edgecomb, superintendent; Mr. C. A. Richardson, manager; Mr. J. D. McDonald, chief operator, and Mr. D. Carter, traffic chief, of the Boston office, and Mr. Charles E. Diehl, manager at Harrisburg.

Mr. J. P. O'Donohue of the electrical engineer's office has just returned from Buffalo, where he has been for a week on company business.

Mr. F. H. Hollenbeck, cashier of the Indianapolis, Ind., office, has been transferred to New York, where he has been attached to the force in the office of Mr. Welcome I. Capen, general superintendent of plant.

The Wright printing telegraph system, which is the invention of Mr. John E. Wright, a well-known New York telegrapher and electrical engineer, will soon be installed on the Washington-New York circuit.

The company is making special arrangements at Beverly, Mass., which will be the summer home of President Taft, to take care of the press and government business, which is likely to be voluminous during the stay of the president at this point.

This company has recently moved into new and commodious quarters at Madison, Wis. H. R. Davis, an electrician of the Chicago office, had charge of the work of installing a new dynamo and new quadruplex and switchboard equipment to provide for increased wire facilities. The new office is up to date in every respect, being one of the best equipped in the state, and Manager Benjamin F. Randall and his staff are to be congratulated.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Mr. Jacob Levin, of Atlanta, Ga., general superintendent of the Southern division, was a visitor in New York last week, coming on business connected with the service.

Barclay printing installations will soon be in operation between San Francisco and Portland, Ore.; Omaha and Denver; New York and Kansas City; New York and Nashville, and New York and Indianapolis.

Mr. C. B. Kelley has been appointed manager at Montpelier, Vt., vice V. A. Doty, resigned to engage in other business. Mr. Clyde Howell has been appointed manager at Barre, Vt., to succeed Mr. Kelley, transferred.

Miss Marie E. Winn has been appointed manager at Oakmont, Pa., vice Miss Jane C. Joyce, made manager at Waynesburg, Pa., to succeed Miss A. J. Jeffery, resigned.

Leonard Cox of New York, aged sixty-eight years, chief traveling auditor of the company, died in San Francisco of heart failure on April 19. Mr. Cox was an old employe of the company, having entered the service in the middle sixties and successively filled the positions of operator, cashier, manager, and since 1886 that of traveling audi-

tor. He had a wide acquaintance with the managers in the various cities and was much respected by them, as well as by the company's executive officers. He was a telegraph operator in the confederate army during the Civil War and was present at the battle of Bull Run, at the siege of Richmond and at the siege of Charleston. The remains were brought east and interred at Nyack, N. Y.

F. J. Dayman, Chief Operator of the Western Union at Cleveland, O.

Frederick John Dayman, who was recently appointed to the chief operatorship of the Cleveland office of the Western Union Telegraph Company, as announced in our April 16 issue, has spent all of his life, since he was twelve years of age, in the telegraph service, and because of the faithful and diligent attention and painstaking effort that has marked the performance of his duties, coupled with ability to keep his forces working together in harmony, he has gradually risen in his chosen profession to his present responsible position.

FREDERICK J. DAYMAN,
Chief Operator, Western Union Telegraph Company, Cleveland, O.

Mr. Dayman was born at Port Hope, Ontario, December 12, 1865, and entered the telegraph service in 1877, as messenger for the Dominion Telegraph Company in his native town. Soon afterwards he became an operator at Toronto and served in this capacity with the Great North Western Telegraph Company after its formation by the amalgamation of the interests of the Dominion and the Montreal Telegraph Companies. In 1880 he was transferred to Detroit and remained there with the Great North Western until 1888 when he left their service to enter that of the Western Union Telegraph Company in the same office. Here he was successively advanced to the positions of all night man, assistant night chief, day wire chief, and finally to night chief operator, which position he held at the time of his recent promotion.

Canadian Pacific Appointments.

The following changes have been made in the staff of the Canadian Pacific Railway Company's telegraphs since those published in our April 16 issue: J. F. N. Caisse has been appointed local manager at Quebec, vice J. Manning, transferred to the Montreal operating staff; J. Mitchell has succeeded Mr. Caisse as inspector of the Eastern division with headquarters at Montreal; H. Bott has been appointed chief operator of the Montreal main office to succeed Mr. Mitchell; A. M. Bennie has become wire chief and A. Malcolm night chief of the Montreal main office; A. E. Jarvis has been appointed traffic chief of the Western lines, and A. O. Fortier has been appointed traffic chief of the Eastern and Southern lines.

Municipal Electricians.

A patent, No. 917,061, for a fire alarm signal system has been granted to B. B. Hatch of Boston, Mass. Means for automatically indicating that the battery or batteries are out of order, the system being a closed circuit one with an alarm bell so arranged that the failure of the battery, etc., gives an alarm.

A patent, No. 917,235, for an automatic fire alarm box has been issued to H. Anderson of Haddonfield, N. J. A motor, an alarm mechanism having two contact members and means operated by the motor during the operation of the alarm for separating the contacts and breaking the motor circuit, together with means for locking the contact member in disengaged position.

The fourteenth annual convention of the International Association of Municipal Electricians, which will take place at Atlantic City, N. J., September 14, 15 and 16, promises to be one of the most successful ever held by the association. The fact that Mr. A. C. Farrand, city electrician of Atlantic City, is chairman of the committee on arrangements is sufficient guarantee that the leisure hours of the convention will be thoroughly enjoyable. Mr. Farrand will have ample space provided for supply men who propose to make suitable exhibits. Any information concerning the association or the coming meeting will be cheerfully supplied by the secretary, Mr. Frank P. Foster, of Corning, N. Y.

The Cable.

It is reported that the Western Telegraph Company is negotiating with the Argentine government at Buenos Aires for the construction of a new cable line to connect Argentine directly with Europe by way of Ascension Island.

The Central and South American Telegraph Company announces that on and after May 1 the rates to Ecuador, Peru, Bolivia and Chile will be reduced to one dollar per word.

The cable belonging to the Martha's Vineyard Telegraph Company, connecting Martha's Vineyard and Nantucket with the mainland at Wood's

Hole, Mass., has been interrupted, caused, it is said, by the wreck of the steamer Massachusetts.

Cable communication is interrupted April 28 with:

Venezuela .....Jan. 12, 1906
Madura Island (Dutch East Indies)..Feb. 3, 1908

Mr. Charles Bright, F. R. S. E., of London, has interesting articles on "Communication by Cable" in the Westminster Review and the Fortnightly Review for March. Mr. Bright reviews the subject from the standpoint of public utility, and states that the trade routes followed by the cables are not good routes from a strategic point of view, and for this and other reasons, such as the necessity for consolidating the British Empire and assisting imperial trade, he advocates the laying of additional cables by the government, to complete the all-British chain of which the Pacific cable forms the first link.

The new cable steamer Telconia, built for the Telegraph Construction and Maintenance Company of London, was recently launched on the River Tyne. The vessel is a steel twin-screw steamer 205 feet in length by thirty feet nine inch beam. She will be fitted with two sets of triple-expansion engines, supplied with steam by two single-ended boilers working under Howden's forced draught system. Two cable tanks, affording over 7,500 cubic feet of space, are provided, and in addition a capacious hold for storing the various types of grapnels used in cable repairing work, buoys, etc. The test rooms on board are equipped with the very latest designs of instruments, etc., and the cable machinery, paying-out and picking-up gear, etc., is of the most modern description.

New Government Cable Steamer, Joseph Henry.

A new cable steamer, the Joseph Henry, which has been specially built for use in connection with the "fire control" system of the United States Signal Corps, was constructed at the Newport News Shipbuilding Company's plant and was recently delivered to the government. Her permanent headquarters will be Fort Wood, in New York harbor.

The Joseph Henry measures 165 feet over all, 32 feet beam, and has a displacement of about five hundred tons. Her engines are of 1,000 horse power, and she has a speed of thirteen knots an hour. On account of the necessity for quick and short turns in some of the harbors along the Atlantic coast, she has been equipped with two rudders.

This vessel is much more stanch and better adapted for its work than those of the Coast Artillery which are used as cable torpedo planters and compares favorably with the ocean cable laying vessels.

In addition to taking care of the fire control work in New York harbor, the new vessel will have as her territory all of the coast line from Portland, Me., to Philadelphia. From Philadelphia south the coast line of the Atlantic fire control system is covered by the cable ship Cyrus W. Field.

The electrical apparatus of this new ship includes cable testing instruments, cable laying, picking up, and repairing outfit, etc. The only noticeable difference between the Joseph Henry and the ocean cable ships is that she has a vertical, instead of a horizontal, cable reel, which is located in the bow of the vessel. The cable runs from this reel along a heavy boom over the side of the vessel. Ocean cable laying ships reel the cable from their holds through a horizontal reel located on the after part of the ship.

The fire control system of the United States army originated in 1898, when $30,000 was appropriated for its development. Since that date large sums have been spent in extending its usefulness. The first money was appropriated on the recommendation of Brigadier-General James Allen, chief signal officer of the army.

The fire control system of the United States is now one of the best in the world. The entire coast line is well laid out with cables which form part of the system, and numerous delicate instruments are used in connection with it.

Across the Narrows in New York Harbor there are more than one hundred wires in cables. Some of the large ocean liners occasionally play havoc with these cables when they pass through, and the new cable ship will have plenty of work to do right there.

Fire control is a system of wires, cables and instruments of various kinds, by means of which an exact sight or aim can be obtained on a vessel some distance from shore, for the purpose of firing upon her. The cables run to several points, at which men are stationed who calculate the distance, speed, etc. This information is telephoned or telegraphed to the adjacent fort, and from the commanding officer to the gun crews. Allowances for speed, distance, etc., are all calculated to a nicety, the aim is invariably correct and the fire is, therefore, effective.

Utah Society of Engineers.

We are in receipt of a printed copy of the second annual report of the Utah Society of Engineers, of which Mr. Donald McNicol, manager of the Postal Telegraph Cable Company, at Salt Lake City, is the efficient secretary. The association has an active membership of about sixty, and the report gives a summary of the meetings held during the past year with the subjects discussed, as well as the reports of the president, secretary and treasurer, which altogether shows that the association is accomplishing much valuable engineering work in Utah.

Dinner of the Magnetic Club.

The spring dinner of the Magnetic Club, which also celebrated the twenty-first anniversary of the birth of the club was held at the Hotel St. Denis, New York, on the evening of April 21. A well-selected program of entertainment of a vaudeville character was carried out to the enjoyment of all. The hundred members and guests present were seated at small tables accommodating eight persons each, while at the head table were George H. Usher, of Atlanta; James Merrihew, David Homer Bates, Reverend Allyn K. Foster, Reverend Melville K. Bailey, Edward J. Nally, Charles C. Adams and Welcome I. Capen, of New York. Above the head table was a large electric sign with the words "twenty-one," indicating the coming of age birthday of the club, and underneath this was "73," meaning, in the language of the telegraph, compliments to all.

President Charles P. Bruch, being unavoidably absent on account of sickness, first vice-president Marsden R. Cockey, after coffee had been served, rapped for order and invited Mr. George H. Usher, of Atlanta, Georgia, a former president of the club, to act as toastmaster. Mr. Usher accepted the tender in a few humorous remarks, and gave a brief history of the organization and early days of the club, in his usual dignified and graceful manner. He then introduced the first speaker of the evening, Reverend Mr. Foster, pastor of the Marcy Avenue Baptist Church, Brooklyn.

Mr. Foster spoke about "Magnetism" and congratulated those present on the fact that they were all magnetic and that through their efforts the world was being more closely united every day. He suggested that the man who does not help to make things move needs some kind of an injection of that magnetism which is in the possession of the members of the Magnetic Club. Mr. Foster spoke optimistically of the future and expressed the belief that the world is improving constantly along all lines.

The next speaker, Reverend M. K. Bailey, of Grace Episcopal Church, New York, took occasion to eulogize the American business man. "The American business man" said he "has to get up early in the morning to do what he is doing in the world, and, in spite of all we may hear to the contrary, he conducts his business as straight as any business man in the world. Only a few years ago people who made predictions of future achievements were often laughed at; in view of what has happened, however, we do not now dare to laugh at any statement of future possibilities."

In characterizing America as the New Europe he said that it matters not to us where a man was born, the only important question we have to ask of him is, "Is he a good citizen?" "This fact," said he, "is an indication that the spirit of human brotherhood is sweeping through the world and uniting all men."

Toastmaster Usher then read a telegram from President Charles P. Bruch, at Atlantic City, N. J., in which he congratulated the club upon arriving at its majority, and expressed a hope that the occasion would be celebrated in a fitting manner. The club voted to send a suitable reply to President Bruch's message, and delegated M .R. Cockey to prepare the telegram. After enjoying the entertainment provided for by the committee of arrangements, of which Theodore L. Cuyler, Jr. has proved an efficient chairman, the gathering broke up in the usual manner of dinners of the club, all present joining hands and singing "Auld Lang Syne."

Among others present, besides those already mentioned, were the following:

Boston—D. Carter, F. M. Ferrin and C. A. Richardson.

Harrisburg, Pa.—C. E. Diehl.

New York—W. J. Austin, S. F. Austin, E. S. Butterfield, W. P. Bowman, E. B. Bruch, E. T. Birdsall, Jas. E. Brick, J. F. Barringer, William H. Baker, L. C. Bell, J. J. Cochrane, John Costelloe, F. H. Cothran, J. J. Cardona, A. R. Carmichael, A. Creighton, J. P. Doherty, B. M. Downs, T. J. Donovan, H. E. Dunham, J. S. Ellis, A. P. Eckert, J. H. Flood, T. E. Fleming, G. W. Fleming, W. Finley, R. Gould, F. M. Gay, J. B. Given, P. A. Hickey, J. H. Hess, W. M. Hassell, G. W. Hickey, J. Hennessy, C. J. Hubbard, F. H. Hollenbeck, Dr. L. R. Hallock, A. S. Hunter, T. J. Howlett, W. T. Irwin, Edson Kimmey, H. Kitt, F. Kernan, C. F. Leonard, Colonel H. Luscomb, Leona Lemon, C. A. Lane, J. A. Manning, J. F. McNeill, W. H. Mathews, F. M. McClintic, F. E. McKiernan, J. P. McBurney, H. T. Marks, L. MacConnach, A. L. Miller, N. A. Malpas, William Maver, Jr., W. B. McCurdy, D. F. Mallen, W. A. Murray, F. F. Norton, B. F. Nachmann, F. W. Parker, E. A. Parker, E. B. Pillsbury, M. J. Pike, C. F. Pearce, Edward Reynolds, H. J. Reinhardt, M. W. Ravens, Eaton V. Reed, T. G. Singleton, Isaac Smith, Charles Shirley, F. A. Scheffler, V. C. Stanley, E. P. Tully, J. B. Taltavall, J. F. Tynan, William Teller, J. D. Underhill, J. J. Whalen, H. Weiss, F. C. Yawger, and H. Zweifel.

Philadelphia—Charles E. Bagley.

Mr. A. W. Orton, an old-time and military telegrapher, of Rome, N. Y., but for many years past engaged in the lumber trade at that point, in renewing his subscription to Telegraph Age recently, has this interesting statement to make:

"I find articles in each number that are of much interest to me. The telegrapher of this age should find your paper of great value to him as an aid to his progress and advancement, for the greater his knowledge the better are his chances for promotion. I have taken pains to pass some of my copies among the local operators, thereby creating an added interest in your journal."

A committee of patent lawyers are urging the Secretary of State to arrange for an international conference for the discussion of patent laws, and particularly of discriminatory laws such as recently enacted in Great Britain.

Radio-Telegraphy.

The United States Government now maintains a total of fifty-seven wireless telegraph coast stations.

A patent, No. 916,429, for a receiver for electromagnetic waves, has been issued to R. A. Fessenden of Washington, D. C. A stream of liquid coming from a nozzle impinges on the diaphragm and forms the receiver.

A patent, No. 917,103, for wireless telegraphy has been issued to J. Murgas of Wilkesbarre, Pa. Produces different spark frequencies without using interrupters. Inserts inductance in the primary circuit of an oscillatory system by pressing a key.

The Berliner Telefunken Gesellschaft, by using two light portable military instruments, has succeeded in establishing communication between Berlin and Vienna, a distance of 550 kilometers, the longest distance yet covered with military apparatus.

A patent, No. 918,255, for an antenna for wireless telegraphy has been awarded to H. E. Athearn of Brooklyn, N. Y. Antenna for wireless made up of a plurality of loops extending horizontally between the upright poles and lying in a vertical plane between them.

There are two wireless telegraph stations in Nova Scotia, one on Sable Island, call letters "S. D.," and one at Camperdown, call letters "C. D." Both stations use the Marconi wireless system, and the continental code, and are in daily communication with steamers at sea.

A patent, No. 918,250 for a Hertzian wave meter has been issued to C. D. Babcock of New York. Consists of a condenser composed of a pair of concentric metal cylinders adjustable longitudinally with relation to each other, provided with a spirally wound inductance and wave measuring scale.

A patent, No. 917,574, for a detecting device for wireless telegraphy has been granted to Reginald A. Fessenden of Brant Rock, Mass. The receiver comprises a conducting liquid and a conducting body projecting thereinto with means for supporting the body so as to balance it against the frictional stress of liquid, together with an indicator.

A patent, No. 917,104, for a magnetic wave detector has been taken out by J. Murgas of Wilkesbarre, Pa. A stationary magnet and a coil of conducting magnetic material rotating in the field of the magnet, together with means for rotating the coil and for conducting oscillations through the coil, the oscillations being rendered manifest by an inductive apparatus.

A patent, No. 918,208, for a transmitting apparatus has been taken out by H. Shoemaker of Jersey City, N. J. A wireless transmitter apparatus to avoid sparking at the telegraph key by means of inductive resistances of different magnitudes connected in the circuit and an inductive resistance and a key adapted to close the circuit in parallel to one of the resistances.

A. Leo Stevens, the aeronaut, has received from the Collins Wireless Telephone Company, a complete wireless telephone equipment, which he will install in a balloon and made an ascension at Springfield, Mass. Wireless telephone stations will be installed on the top of some high buildings in New York and Boston, and Mr. Stevens expects to be able to keep in telephonic communication with these stations during his flight.

A recent paper written by C. C. Monckton, of London, England, on the dieclectric strength of compressed air discusses the use of compressed air in the spark transmitters of wireless telegraph installations for the purpose of increasing the range of the apparatus. It permits higher potentials to be used with the same gap. The smaller gap, and consequently lower resistance when compressed air is used, reduces the damping effect.

A patent, No. 918,306, for a method of wireless signaling has been granted to R. A. Fessenden of Brant Rock, Mass. A method of wireless signaling employing the apparatus of patent No. 981,307, eliminating disturbing impulses by generating waves of a definite frequency in groups of a group frequency of 250 per second, but within the limits of audibility and receiving the same with an indicator unresponsive to the group frequency.

The March number of the Journal of the Engineers' Club of Central Pennsylvania contains a very interesting article on wireless telegraphy and telephony, read before that club by Mr. H. S. Webb of the International Correspondence Schools, Scranton, Pa. Mr. Webb gives in a concise and instructive manner the history of the wireless art from its beginning up to the present time, together with a description of the principles involved in the different commercial systems in use to-day.

A patent No. 918,307, for an apparatus for wireless signaling, has been secured by R. A. Fessenden, of Brant Rock, Mass. Avoids atmospheric disturbances by providing a generator sending out waves of a definite frequency higher than 250 per second and breaking them up into trains which succeed each other at a frequency above the normal frequency used for alternating current work. The attention of the hearer is concentrated on the higher notes, so that the low noises made by atmospheric disturbances do not affect him.

Men in the British navy rated as telegraphers have hitherto often been called upon to help coal the ships. It has been represented that this rough manual labor reduces their efficiency as operators for several days, and accordingly the Admiralty has directed that in the future they shall be exempt from this work. One indisputable claim of the telegraphers which helped to bring about the issuance of this order was that the qualifications for a good telegrapher were entirely different from those required for a good coal heaver.

The Radio Telephone Company will soon occupy a new factory in Newark, N. J., consisting

of over 5,000 square feet of floor space, which will be devoted to the manufacture of wireless telephone and telegraph apparatus. A subsidiary concern, the Great Lakes Radio Telephone Company, is to erect a steel wireless tower on the roof of the Hippodrome Building in Cleveland, Ohio, as a transmitting and receiving station for wireless messages from all over the great lakes. They expect to have seventy-five stations in operation along the lakes during the coming summer.

The first commercial wireless telephone system in the world was thrown open to the general public at Portland, Me., April 16. Four out of thirty stations which will connect Portland with the islands of Casco Bay are in commission. Heretofore telephone connection between Portland and these islands has been impossible, owing to the rocky bottom and swift tides. Four wireless telephones were used at the same time and each received its designated message. A new tuning apparatus, invented by Mr. A. F. Collins, was used, and the inventor says he has solved the problem of selectivity, thus making the wireless telephone even more secret than the present wire telephone systems.

The difference between the Edison system of communicating telegraphically with moving trains and the wireless telegraph system is that the Edison plan which was tried out on the Lehigh Valley Railroad about twenty-five years ago employed a board covered with tinfoil mounted edgewise on a car roof. The tinfoil formed part of a local telegraph circuit, which inductively affected the telegraph wires that paralleled the tracks, and in this way the messages were made to "leap" from the train to the telegraph line. The recent experiments which were tried on the Lake Shore Railroad, as recorded in these columns, employed Hertzian waves which transmitted the messages directly to the receiving stations and not to the telegraph wire along the track.

The wireless telegraph plant of the Boston Herald, mention of which was made in our columns in the previous issue, was placed in operation April 12. The first message received was from Washington, being one of congratulation from Secretary of the Navy George von L. Meyer. The Herald makes the claim that there is only one other wireless station in the United States that possesses the receiving advantages of their outfit, and that is in the government station in the Brooklyn navy yard. The antenna of the navy yard station are two hundred and fifty feet long, while those of The Herald station are two hundred and twenty feet long; but The Herald has the additional advantage of the T shaped antenna, the wires going to the receiver coming from the horizontal antenna at the middle instead of the end, and the great length of the horizontals, and the T shape of the antenna give a surface of unusual extent and enables the operator to catch messages that would be indistinguishable to the ordinary station. The equipment of this station, as well as that installed by the Buffalo News, which was also referred to in our previous issue, was manufactured by the Stone Telegraph and Telephone Company of Boston.

A Timely Study of Wireless Telegraphy.

There has been a steady demand for operators in the wireless telegraph service, as that system has extended its operations, until to-day hundreds who were formerly employed as Morse operators are now occupying lucrative positions in the wireless field, at seaside, or on steamer, stations. The passage of the wireless telegraph bill in the House, doubtless soon to be followed by like action in the Senate, making it compulsory that practically all ocean-going vessels engaged in carrying passengers shall be equipped with wireless telegraphy, makes it evident that a very much larger field of employment, and at good pay, in the immediate future is opening up to the telegraph operataor who will adapt himself to the newer method of radio-telegraphing. Operators everywhere are earnestly investigating this branch of the telegraph, since as its vast opportunities to benefit the individual become more apparent with the development of the system now progressing so rapidly.

A good text book on wireless telegraphy is the first need of any who contemplate the study of that system. The sale of such works has increased enormously of late, clearly indicating the development of a widespread desire for knowledge on the subject.

For the convenience of our readers we have prepared and published in our catalogue, together with prices, a carefully selected list of standard books treating on wireless telegraphy. These volumes furnish the best information on the subject obtainable, the kind giving the most efficient aid and direction to the student. Orders for the books enumerated, or indeed for any others that may be required, which must be accompanied by the cash, will be filled on the day of their receipt, and sent with all the carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Weston Correspondence School.

We are in receipt from the Weston Electrical Instrument Company of an original advertising novelty in the shape of a private postcard issued by them. This card is written up in the form of a lesson of the Weston Correspondence School. The subject of this lesson, which is part of a course in economics, is "First cost not whole cost," and under this heading they show in a logical manner the advantages of the Weston instruments from the standpoint of cost. This new form of advertising has received such favorable comment that it has been decided to follow it up with other issues, giving courses in electricity, mechanics, logic, physics, chemistry, etc.

The Military Telegrapher in the Civil War.

PART XVIII.

The following graphic contribution to the history of the military telegraph was written by Dr. J. Emmet O'Brien, who now resides at Scranton, Pa., and has been for many years past a member of the medical profession in that city, where lives also his brother, Richard O'Brien. Dr. O'Brien was the youngest member of the telegraph corps, and in his article, which was written in 1878 to William R. Plum, historian of the Society of the United States Military Telegraph Corps, he gives evidence of having displayed rare judgment and coolness of action in the discharge of his duties, even though under the direct supervision of his older brother, Richard O'Brien.

The value of these interesting historical contributions rests in the fact that they were written over thirty years ago, while the incidents mentioned were still fresh in the minds of the authors. These articles have been filed away since they were prepared, and are now, with their interesting contents, for the first time made public.

"'The Military Telegraph, which attained an extent of 15,389 miles of lines constructed during the period of hostilities with a total expenditure of $3,219,400 during the war and $567,637 during the last fiscal year, has been discontinued, the material sold and disposed of, and the employees discharged, only a few confidential operators being still retained for cipher correspondence with commanders of important districts. (Report of Secretary Stanton to Congress.)

"The organization thus epitomized by the great Secretary was of incalculable service to the country during the Civil War; it invested our armies with a new intelligence, co-ordinated their movements and placed them en rapport with each other and with the War Department at Washington.

"Modern wars are said to be fought by rail and telegraph; the Civil War was the first in which the latter was used. The historian of the military telegraph will be able to illuminate, as with electric light, the inner record of the great events and men of those times.

"The writer, who was one of the confidential operators mentioned in Stanton's brief epitaph of the Military Telegraph, will give now only a slight sketch of personal reminiscence, but will attempt with Richard O'Brien's graphic aid to paint a little word picture of the great battle of the first ironclads.

"The Military Telegraph Corps grew from a slender nucleus. In April, 1861, the nation began pouring its defenders toward Washington; wisdom, skill and energy were needed to forward and concentrate them; the direct route through Baltimore had been broken up and bridges burned by the mob after the passage of the first detachment on the memorable nineteenth. With his characteristic intuition in the selection of men, Mr. Lincoln met the emergency by calling on Thomas A. Scott and Andrew Carnegie to organize the rail routes converging on the capital for the concentration of forces and supplies there. Carnegie, feeling the need of trusty telegraphers in his immediate undertaking, and foreseeing the future importance of the telegraph in the conduct of the war, called four of his most experienced men from the Pennsylvania Railroad. The little party who responded constituted the germ of the Military Telegraph Corps. They reported at Washington, April 27, via Philadelphia, Perryville and the bay; their names deserve to be recorded: David Strouse, Samuel Brown, D. Homer Bates and Richard O'Brien. The first two were stationed at the War Department; Bates at the Navy Yard, and O'Brien at the Baltimore and Ohio Depot, to assist in running trains. Scott and Carnegie accomplished their task with wonderful energy and despatch. With his operators Carnegie moved his station to Annapolis, accompanying Butler's advance, thence to the Relay House, and finally to Baltimore.

"About this time our quartette received an accession in volunteers from the North, including William Tinney, Albert Snyder and Jesse Crouse. The first government line was built to connect the Navy Yard with the War Department, the Arsenal was brought into circuit, lines extended to the chain bridge, and other outposts, and on May 24, the day our troops occupied Alexandria, the first military telegraph station in the old dominion was opened in the Arlington House; the next was opened in Alexendria on the same day, and the line extended to the farthest outpost, Falls Church.

"When McDowell moved out to attack the enemy, the lines were run to Springfield, Fairfax Station, and Fairfax Court House. The office at Springfield was opened on the nineteenth of July and closed at eight a. m. on July 22 for good and sufficient reasons. During the battle of Bull Run a line of couriers conveyed reports from the field to the office at Fairfax Court House.

"The following paragraph is condensed from a sketch by W. B. Wilson, one of the corps, in 'The Telegrapher':

"'In the telegraph office at the War Department throughout Sunday, July 21, 1861, were congregated the President, most of his Cabinet, General Scott's staff officers, Colonel Thomas A. Scott and others, with maps of the field before them. Hour after hour, as the couriers reported our gallant troops steadily forcing the enemy back, hopes beat high, expectation, satisfaction, was discernible on every brow, and the cheers of our patriotic soldiery as they fought bravely on, were responded to in the hearts of all present.

"Suddenly as the shades of evening were drawing on apace, a lull occurred. Firing could not be heard by the corps of observation. No couriers arrived at Fairfax. What could be the matter? The most plausible reason advanced was that our army now victorious, were resting after

the hard fighting of that hot summer day. Every few minutes Fairfax was signaled, but only to receive from the operator the stereotyped reply of 'no news.' An hour was expended, when, like the quick flash of lightning came those stunning words: 'Our army is in full retreat.' The signals now became more frequent, rapid and excited. The retreat soon resolved itself into a perfect rout, and as the telegraph reported to those assembled round the instrument at the War Department, the terrible scenes, and heart-rending stories of suffering during that never-to-be-forgotten night, all seemed to feel that the hour of the nation's greatest peril had arrived.'

"Wilson adds that the President was cool and clear visioned, encouraging the others during that trying time..

"After Bull Run, David Strouse, whom all loved, and who had been superintendent of the young corps, went home to die. He sleeps on the banks of the Juniata.

"James R. Gilmore temporarily took his place and my brother, Richard O'Brien, was sent to take charge of telegraphic affairs on the peninsula. The peninsula is hallowed ground to me. From the ramparts of Fort Monroe we saw the black smoke of the Merrimac creeping down the Elizabeth River, the terrible combat with the Cumberland, the burning of the Congress, the fight the next day with the Monitor. The masts of the Cumberland still lifted themselves above the mouth of the James when I passed there at the close of the war, appealing as I had seen the arms of our dead soldiers from their shallow graves on the Chicahominy and at Williamsburg, to patriotism and to humanity, lifting a mute but eloquent protest against war.

"We saw the assembling of the Army of the Potomac in the great peninsular campaign when the telegraph accompanied every movement of the army, connecting each corps with McClellan's headquarters, and the whole with Fort Monroe and Washington. Again in Grant's campaign and final victory the military telegraph played a most important part.

"In 1861 our forces simply occupied Fort Monroe and Newport News at the mouth of the James. These points were connected by telegraph, but the Confederates, whose pickets extended as low as Newmarket, projected frequent raids from that point against the line. In these raids, made mostly under cover of night, the enemy frequently carried off long sections of the wire through the woods. Richard O'Brien wished to have the whole line picketed, but the military commanders considered that such a step would only invite attack upon the small force which could be spared. For half a year after his arrival (in August, '61,) the line was kept up by his individual exertions, aided by an occasional guard from Camp Hamilton.

"The following is a specimen of a number of orders which I find among our papers:

Headquarters,
Camps Hamilton and Butler,
August 25, 1861.

Colonel Weber will detail a company from his regiment to accompany the Superintendent of the Telegraph upon an expedition to inspect and repair the line. The picket guards will pass the detachment.

(Signed) Benjamin F. Butler,
Major-General, U. S. A.

"I joined the corps in February, '62, aged thirteen years, with three years' experience in fourteen offices on the Pennsylvania Railroad already behind me. I shall never forget my first impressions of the 'pomp and circumstance of glorious war' as exemplified in the frowning ramparts of Fortress Monroe crowned and pierced by its four hundred guns.

"I entered the grim portal and sought the headquarters of General Wool. My brother happened to be absent, but hearing the familiar click of a relay, I seized the key and signaled '134 (who is writing?) answer X.' Question: Who is X and where? Having first ascertained who I was, the operator gave his sign as George B. Cowlam, member of Ellsworth's fire zouaves stationed at Newport News, and said that he had a message for General Wool from General Mansfield. I told him to go ahead, and just as I began to write down the message General Wool came into the room. He was somewhat surprised and incredulous at my performance, but when I handed him General Mansfield's telegram he was convinced that 'so young a lad' could operate by sound.

"The days passed monotonously at Old Point Comfort in the early spring of '62. At length a new element began to obtrude itself in the equation of war, rumors of a floating monster, impervious to shot or shell, reached us through intelligent contrabands from Norfolk and finally resolved themselves into certainty. Daily after that our glasses swept Sewell's Point, Craney Island, and the mouth of the Elizabeth. At last on the 8th of March, about noon, a line of black smoke painted itself on the sky behind Sewell's Point and crept down the river. I was on the ramparts at the time, and ran to the instruments to signal Newport News. Cowlam was on hand. The alarm gun was fired in Fort Monroe, the long roll called the gunners to their stations and the garrison to arms, and almost immediately I heard the heavy guns of the fleet reverberating across the water. I could distinguish the vindicative thunder of the Sawyer gun on the Rip-Raps and as the discharge of the heavy guns of the fort shook my instruments, I caught Cowlam's message, 'She is steering straight for the Cumberland.' 'The Cumberland gives her a broadside.' 'She keels over.' 'Seems to be sinking.' 'No, she comes on again.' 'She has struck the Cumberland.' 'God! the Cumberland is sinking.' 'She has fired her last broadside.'

"Thus did the telegraph picture to us the scenes of that eventful day; some of them visible also from our ramparts; others hidden from us by the shore as the unequal combatants shifted their

positions. The shock given in the announcement of the final catastrophe as I read it from the instrument to the officers surrounding me was such as no danger, save at the cannon's mouth, could have produced. I attempt no detailed description of the famous combat; it is too well known to need repetition here. Our gallant Zouave Cowlam stood by his key and gave us every phase of the fight from his nearer viewpoint at Newport News, while the shells of the enemy whistled over his head and tore through his office. Two shells passed through his cabin within a few feet of his instruments, as I afterwards verified, and yet George's familiar touch on the key was as firm as his grip on my hand when we next met, after the fight was over.

"That night we watched the Congress burning like a meteor in the blackness, and waited for the morrow to bring the combat, which seemed inevitable, and which we ardently hoped for, between the fort itself and the ironclad. All felt that there was enough metal in the fort to avenge the loss of our ships, but the Monitor came and brought a wonderful solution to the problem. I will let Richard O'Brien's diary tell the story of the second day:

"'On March 9, '62. At six a. m. the Merrimac was seen steaming down the Elizabeth River. General Wool having placed the fort in fighting trim, rode out with his staff through Camp Hamilton and the ruins of Hampton to a point on the shore nearest the Minnesota, which was still aground. I accompanied the party. The Monitor, which had arrived the previous night, lay under the shadow of the Minnesota, and seemed to us a feeble defence to lean upon against the invincible monster which had made such short work of two of our finest warships the previous evening. When the Merrimac passed Sewell's Point she turned towards the fort, and we were about to hurry back to help receive her, but when near the Rip-Raps she turned again and came straight for the Minnesota, which opened fire upon her, the Monitor now ran down to meet her, the Merrimac slowed up a moment as if to make out what the strange little craft could be, when Worden blazed away and solved the question for them. The Merrimac quickly responded. They both 'let slip the dogs of war,' the Confederate bulldogs growling from every porthole, and the little terrier of the North, more active than her unwieldly antagonist, snarling at every rib of the larger craft. The Monitor got around more quickly than the Merrimac and tried her sides, quarter and stern, but every shot that struck glanced from the greased rails into the air with the scream of a baffled demon. The Merrimac fired rapidly and viciously, but seemed equally unable to injure her antagonist, and so turned her attention again to the Minnesota; the latter discharged a broadside at her without the slightest effect, and received in return a shell from the bow gun of the Merrimac, which burst in the officers' quarters and set the ship on fire. Another shot struck the tugboat Dragon, which was engaged in trying to haul the Minnesota off, passing through and bursting its boiler. A terrific fire was kept up by the Minnesota from every gun that could be brought to bear. A third shell passed over the Minnesota and burst unpleasantly near us. Before the Merrimac could fire again the Monitor had gotten between her and the Minnesota, forcing her to change her base, in doing which she got aground, but soon swung off and headed for the Rip-Raps with the Monitor close at her heels. They had not gone far, however, when the Merrimac turned round suddenly and tried to run into the Monitor. The latter made a very narrow escape, the great prow of the Merrimac leaving an ugly scar on her iron armor. They then pounded away at each other for some time, when the Monitor drew off towards the fort. We feared she had received serious injury. The Merrimac with her consorts, the Jamestown and Yorktown (or Patrick Henry), which had thus far kept at a respectful distance, now started towards the Minnesota, which we felt sure was doomed. They changed their course, however, for some unaccountable reason, and heading up the Elizabeth River left us, for this day at least, masters of the situation.'

"Early in 1862 a new era in the history of the Corps was inaugurated by the promulgation of the following:

General Order No. 38.

War Department
Adjutant-General's Office,
Washington, April 8, 1862.

Colonel Anson Stager, Assistant Quarter Master, has been appointed Military Superintendent of Telegraph Lines throughout the United States. Commanding officers in the military service will, upon the requisition of Colonel Stager, or of his assistants, give such aid as may be necessary in the construction, repair and protection of military telegraph lines, and will furnish to the employes connected with those lines, transportation, rations in kind, fuel, light, stationery and shelter, such as are allowed to other government employes.

By order of the Secretary of War,

L. Thomas,
Adjutant-General.

Official:
E. D. Townsend,
Assistant Adjutant-General.

"Major Thomas T. Eckert had charge of the military telegraph lines about Washington, with the Army of the Potomac, and in the eastern field generally. Under these competent and energetic chiefs lines were built, cables laid, the cipher instituted and the Military Telegraph, so opportunely started by Andrew Carnegie, assumed proportions and efficiency equal to the nation's needs in the great emergency.

"Some time I may be tempted to fully record our experiences with the Armies of the Potomac and the James and with Sherman's Army, for all of which forces my brother Richard built and managed various lines in the field in Virginia and North Carolina throughout the war."

Telegraph Age.

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

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

TERMS OF SUBSCRIPTION.

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

ADDRESS ALL COMMUNICATIONS TO
J. B. TALTAVALL, - Editor and Publisher,
253 BROADWAY, NEW YORK.

W. N. GATES, SPECIAL ADV. AGT., GARFIELD BLDG., CLEVELAND, O.

CABLE ADDRESS: "Telegage," New York.

Telephone: 6657 Barclay

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MAY 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 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.

Editorial Note.

The following highly interesting and important statement appears in the report of the Department of Commerce and Labor sent to the United States Senate in February, 1909:

"An official of the Postal Telegraph-Cable Company stated, in relation to railroad contracts, that his company had a few, but they had of late years refused to be made a party to a seesaw competition that enabled the railroads in the end to get practically all the revenue from commercial messages sent through these offices and get their own business deadheaded in the bargain. He considered that the railroad contract in its present form was an evil that would eventually bankrupt the telegraph companies."

The Obnoxious Texas Laws.

A new charter fee bill has been enacted by the State of Texas which reduces the amount charged to foreign corporations to transact business within that State to one-tenth the previous amount, which the State endeavored to collect and which many corporations refused to pay, some of them going so far as to decline to transact any further business in the State.

Reference was made to the ouster case against the Western Union Telegraph Company editorially, in our previous issue. Now the State of Texas undoubtedly seeing the error in enacting confiscatory laws has reduced the charge against the Western Union from $100,040 to $10,000. The average Texan legislator is evidently under the impression that telegraph, telephone, railroad and other corporations are legitimate objects of attack for the politician imbued with enlarged ideas of spoils. Texas, we are glad to note, is returning to its sober senses, and it is hoped that hereafter the citizens of that great State will pursue a more conservative and conciliatory policy in the enactment of its laws, regulating commercial enterprises, whether foreign or of State organization.

The underlying sentiment which pervades the resolutions now being passed by many commercial organizations throughout the country calls for conservatism in law-making which has for its purpose the restriction and regulation of railroads. There is no doubt that the making of laws ought to be a matter of more deliberation than has been the case for some time past.

To Improve the Service.

To better the telegraph service which, it is stated, needs improving in many sections of the country, it has been suggested that occasional meetings of telegraph employes should be held in the local districts to discuss the rules and regulations of employing interests and to encourage loyalty among employes. Each employe should be given an opportunity to bring up any matter for discussion that he may deem advisable, even though he alone personally is concerned in the outcome of the question. The meeting of officials and employes under such conditions gives renewed interest and new enthusiasm to the men, which is one of the foundation stones of success to any corporation. If employes possess enthusiasm they are better prepared to meet and overcome the obstacles which they encounter in their daily avocation. Enthusiasm lightens their burdens. It is the antithesis of lethargy. Lethargy and "rutty" are synonymous terms and mean dry rot. A corporation whose officials lack enthusiasm has dry rot in its make-up. Officers and men meeting under the conditions mentioned are brought closer together and reach a better understanding of the positions which they occupy and the relations which bind official superiors and subordinates. Small irregularities are corrected which prevent larger ones from developing. Loyalty to employing interests manifested under such conditions commands the highest respect and should be encouraged. When men realize that however humble the positions they occupy may be that they are surrounded by friends in every

department, the work in hand is greatly facilitated.

It is true that every employe of a large corporation cannot hope to occupy the position of general manager, general superintendent or even district superintendent, but it is equally true that if a person equips himself to fill such positions and no vacancies occur, he is eminently qualified to fill important places in more enlarged fields of endeavor where advancement is perhaps more rapid. This condition is not alone applicable to the telegraph, but is true to a more or less extent in other occupations. It is a common complaint of certain employes that promotion does not come fast enough in the telegraph service and it appears to many that favoritism is shown in the selection of some to fill vacancies. On the other hand, in countries where the priority system of appointment prevails, the enterprising members of the staffs charge those in authority with unfairness in selecting incapable and unfit persons to fill vacancies. Priority laws mean that persons next in line of promotion must be appointed to fill vacancies whether qualified or not. According to priority rules, all employes are put on an absolute equality, irrespective of ability, diligence or character. The result of living up to such absurd laws is stagnation in the civil service of every government where this rule obtains. The operators in France recently went on strike because the government undertook to substitute merit for priority as the basis of promotion. The first-class operators in Australia to-day are indignant because they are compelled to submit to the priority laws and be assigned to places behind individuals incompetent and inactive, yet who are able to keep in advance of their more enterprising brothers through the operation of these absurd rules.

Merit ought always to be the only basis of promotion, and those who depend upon priority laws for advancement will awaken sooner or later to a realization that they have lost much valuable time in seeking that which they have not earned.

The Construction of a Trade Journal.

The published names appearing as editors of a trade journal, such, for instance, as Telegraph Age, indicate those in whom is lodged the responsibility of preparing its reading columns—personally contributing thereto, accepting, rejecting and shaping, or more properly speaking, editing the varied material constituting its contents. The financial success of any journal, whether devoted to special interests or not, is largely due to the business ability of the publisher, and this is best promoted, as may be readily understood, when purpose and action closely link in harmonious composite the editorial and publishing departments.

A newspaper is made up of many units. These when carefully sorted out, worked over and put in place, are in their entirety of presentation as a piece of mosaic, reflecting, it may be, skill in the finished product, or perhaps, as some are disposed to think, a lack of it, yet speaking frequently with the tongues of many. This construction work, so to speak, devolves upon the editors—the builders of the paper. They fashion it much as a builder does his house, using the varied material brought together for its creation, arranging fact and fancy, light and shadow, color and effect, frequently with vivid and strong contrast.

Material flows into a paper as grist to a mill, most of it coming in an exceedingly raw state, especially when expressed in verse, such as occasionally finds its way even to Telegraph Age. Next to poetry is the "stuff" which flows in perennial abundance from sources actuated by a good natured desire to send something to the paper to help fill up its columns. Much of the best material is gleaned from the voluminous sheets of the correspondent, from the memoranda of the advertiser, the letter of the subscriber and many other sources. In the case of Telegraph Age this correspondence amounts to hundreds of letters per day reaching us from the remote parts of the world. In order to get at the kernel or meat of all their material the editor is forced to read over the whole mass and must possess a great amount of patience. Yet when extracted and polished up a nugget of real excellence is sometimes developed into an exceedingly interesting bit of information. These may be regarded as bits of decorative material, bright, attractive and as pleasing as the most desirable bit of trim or fresco in the dwelling of man. The editor must, of course, have a mind trained to know what to accept and what to reject; how to fashion and use the material at his hand, the culling and adaptation of articles found in other publications; the discernment to substitute the word "while" for "whilst," and to spell favor without a "u" when borrowing from his English exchanges, a source of much that is excellent in material, for it should not be forgotten that Sir William H. Preece and others, whom we are honored in referring to, are English, "don't you know." Then the editor must be sure of his translations when republishing articles found in other foreign journals.

He must also be careful as to his "style," no matter how rushed he may be, especially when behind time, for any unevenness is very apt to be observed.

The editorial task is never completed. He is expected to know everything as an encyclopedia of information, always on tap and always at the disposal of the public.

Mr. J. J. Dunne, manager of the Postal Telegraph-Cable Company, at Seattle, Wash., in renewing his subscription, takes occasion to remark that he considers Telegraph Age of the greatest benefit to anyone who wishes to keep abreast of the business, and trusts that the paper is receiving the support it deserves.

The Telephone For Train Despatching.*

BY W. E. HARKNESS, OF NEW YORK.

(Continued from page 288, April 16 issue.)

With but few exceptions the lines constructed for telephone despatching have been of such character that there should be no difficulty experienced due to the length of the line or the kind and size of the wire.

The number of stations connected to the line varies from ten to forty-four, and this with the various methods of operation has necessitated special attention being given to this point.

In regular commercial telephone service there are usually but two people talking or listening on the line at a time, while in despatching service it is customary to have from three to five operators in addition to the despatcher all connected to the line at the same time, and in addition an unknown number of other stations listening to their conversation. The limit in numbers being fixed by the total stations having access to the line. These two conditions demand entirely different telephone apparatus and circuits, as in the first case the telephonic currents are divided between the receivers at the two stations, while in the second case the telephonic currents must be divided among the receivers of three, five or even twenty or more stations, depending upon the number of operators listening in on the circuit.

Various methods of rendering efficient service under these severe conditions have been proposed and tried. Some have attempted to equalize the telephonic current passing through the receivers at the various stations, others have increased the volume of transmission, and still others by a combination of the two have attempted to secure more satisfactory results.

In some cases increased volume of transmission has been accomplished at an increase in battery consumption and a decrease in the clearness of articulation.

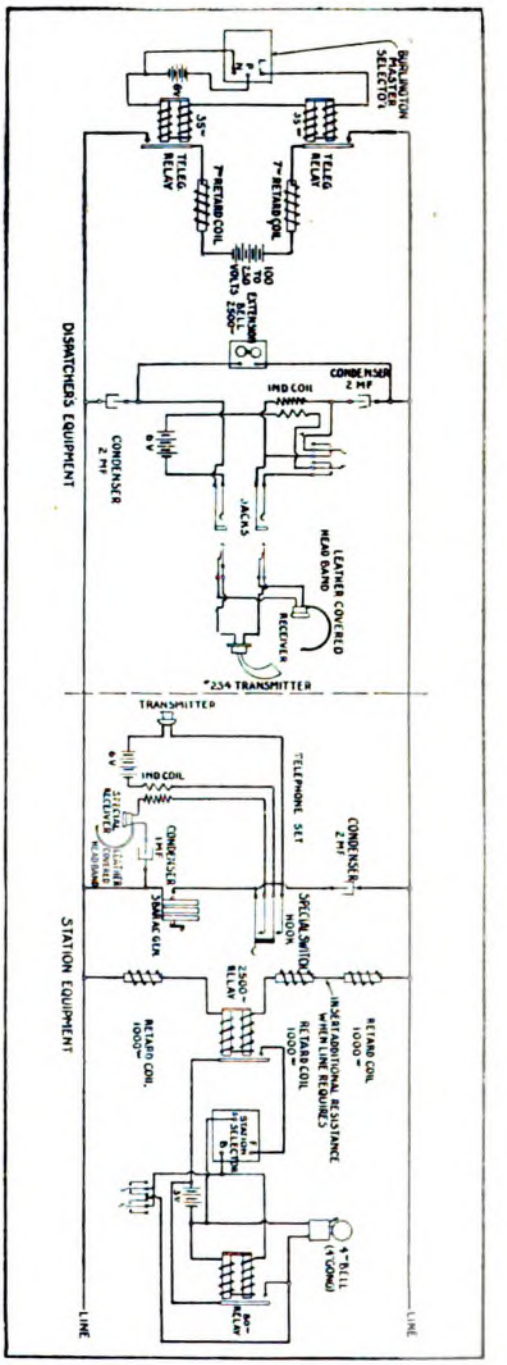
In others the volume of transmission has been decreased to obtain clearer articulation.

The great difficulty in settling a matter of this kind is the fact that there is no standard which can be readily used and with which the actual service rendered on a line can be compared. No two users of a telephone will agree as to the relative volume or articulation obtained on two different circuits, as it is largely a matter of opinion. Even with skilled observers differences in volume of transmission are often taken for differences in quality of articulation and vice versa, or the amount of difference will vary within a wide range.

With the ordinary user of the telephone these errors are greatly magnified and therefore anything but correct.

A comparison of a laboratory standard and a working line is a physical impossibility if the tests are to be made by the same parties and under the same conditions.

In comparing the relative merits of telephonic apparatus, it should be remembered that the conditions should be the same throughout, and that comparisons made by observing the service on one line and then several days later observing



the service on the same or a different line cannot be considered as fair, as it is impossible for the mind to accurately retain the impressions imparted by the ear for any length of time. Further, in making tests on actual lines it is impossible to control changes in atmospheric or physi-

* Paper read before the St. Louis Railway Club, February 12, 1909.

cal conditions, and changes may occur in an instant which will seriously affect the results of a comparison.

It may be of interest to learn how accurate comparisons in transmission are made and the standards which are used.

The limit of commercial transmission is taken as that obtained over a 1,000 mile circuit of No. 8 British wire gauge copper, using standard telephone sets and circuits. It is, of course, impossible to make tests over an actual line of this kind so the characteristics of such a line, such as resistances, capacity and impedance, all of which have an effect on telephone transmission, being known; artificial lines have been constructed which possess all of the electrical properties of the actual line, and comparisons are made with these as a basis. To reduce the chances of error still further, these artificial lines have been compared with standard No. 19 gauge paper insulated telephone cable and reduced to terms of miles of No. 19 gauge cable. This establishes a unit of comparison, and all comparisons are expressed in these units. In this way it has been determined that transmission over 1,000 miles of No. 8 British wire gauge copper circuit is equivalent to that obtained through thirty miles of standard No. 19 gauge paper insulated cable.

In the same way comparisons have been made with circuits of various gauge wires, both of copper and iron, and the results of tests can thus be expressed in terms of any character of line or cable if so desired, or conditions set up equivalent to any length or kind of circuit. The development and construction of such standards require a large amount of time and money, which prohibits their general use.

With a standard artificial line such as has been described a comparison of different telephonic apparatus can be made, and the differences in the service rendered determined without danger of the results being affected by unknown troubles on the line, and further, the differences can be expressed in definite terms.

With this arrangement differences in transmission can be determined which to the ordinary user could not be distinguished.

By an arrangement of switches, transmitters or receivers of various types can be compared or connected in circuit with various induction coils, thus determining the relative merits of various parts of the equipment. By another switch the battery supply may be varied and the effect of different amounts of current through the transmitter determined.

SPECIAL WAY STATION TRANSMITTER ARM.

Numerous attempts have been made to measure the relative transmission obtained from telephone instruments of various types or to apply well-known mathematical formula to determine their relative merits, but up to the present nothing has been found to be as accurate as the method previously mentioned, owing to the fact that no instrument has yet been devised which will distinguish between good and bad articulation as accurately as the human ear.

For a number of months work has been carried on with the idea of developing apparatus which will enable transmission to be rendered having sufficient volume and clear articulation and at a minimum consumption of battery as to satisfy the most critical. It is expected that this work will be completed and the apparatus be available for use within a short time.

Various types of telephone sets are being used at the stations, each of which has certain advantages and disadvantages, and the selection is largely a matter of opinion based on operating merits or cost.

A number of the eastern railroads are using a special transmitter arm so arranged that the transmitter and receiver are fixed on the arm, and the operator upon placing his ear to the receiver has his mouth in line with the transmitter. This arrangement permits the operator to have the use of both hands, and the operator is required to assume a proper position as regards the transmitter.

VAN AKIN TELEPHONE ARM.

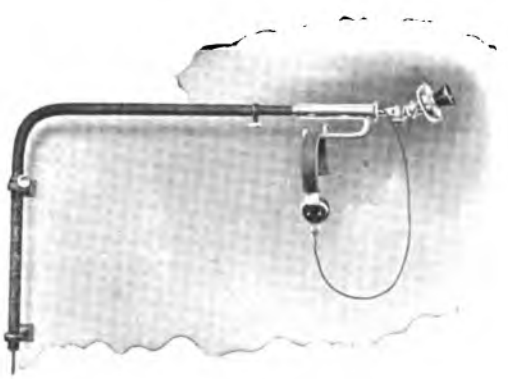
The arm is arranged with an adjustable mouthpiece on the transmitter, and an adjustable earpiece on the receiver to allow for different sizes and shapes of faces. A switch connecting the set to the line is operated when the arm is moved to the position in which it is used by the operator. A foot switch is used to close the transmitter battery in place of a key operated by hand. This is used to prevent a waste of battery and the introduction of noise on the line when an operator is listening in on the circuit.

FOOT SWITCH.

The operators using these sets also operate the interlocking switches, and for this reason it was not thought advisable to use a set which would necessitate their wearing a head telephone which might interfere at times with their rapid movement.

A number of the western railroads have been using a simple form of transmitter arm with which a head telephone is used, thus giving the operator considerable freedom of movement.

The telephone equipment is connected to the circuit by removing the head telephone from a switch hook upon which it is hung when not in use.



TRANSMITTER ARM WITH HEAD TELEPHONE.

A key operated by hand is provided to close the transmitter battery during conversation. This key is arranged to open the transmitter circuit when released by the operator, thus permitting him to listen on the circuit without a waste of battery or causing a noise on the circuit. A foot switch could be used with this equipment if desired. The use of the transmitter key has not been found objectionable, as it is not necessary to hold the key when receiving, thus having both hands free for

writing, and when talking the operator is not required to write, so that there is no necessity for him to have both hands free.

The only objection that can be raised to this arm is that the operator is not compelled to speak directly into the transmitter by the association of the transmitter and receiver. This apparently has not caused any serious trouble. In fact, the despatcher can readily determine if the operator fails to use the apparatus correctly, as the difference between speaking directly into the transmitter or at some distance away from it is very apparent.

DESK STAND WITH HEAD TELEPHONE.

The desk stand arranged for a head telephone has also been used, principally on account of its low price. It is open to the same objections as the arm previously described, and in addition to this is liable to injury by being knocked off the desk. It has the advantage, however, of being located so as to be convenient to several people.

(To be continued.)

The Miniature Sounder at the Carnegie "73" Dinner.

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

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

The Quadruplex.

"The Quadruplex," by Maver and Davis, is doubtless the most thoroughly practical low-priced work treating on this subject ever published.

It is clear and lucid in its style, a text-book free of all technicalities and easily comprehended. It contains 128 large pages, is copiously illustrated, bound in cloth and well printed on heavy paper.

It embraces just the ideas that should find a place in every telegraph office, and no telegrapher who desires to acquire a complete knowledge of multiplex telegraphy, the perfect understanding of which is so essential in these days, should fail to promptly obtain a copy of this important book.

Its chapters include: Development of the Quadruplex; Introduction and Explanation; The Transmitter, Rheostat and Condenser; Stearns Duplex; Instruments of the Polar Duplex; The Polar Duplex; The Quadruplex; The Dynamo-Electric Machine in Relation to the Quadruplex; The Practical Working of the Quadruplex; Telegraph Repeaters; The Wheatstone Automatic Telegraph.

It will be seen at a glance that such chapters as these fully cover the modern apparatus found in the telegraph offices of to-day. Copies of this book can be obtained from us at $1.50 each, express charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

As there are only a few copies of this important work on hand and as a new edition of the book is not contemplated, it will be well to secure a copy before the supply is exhausted.

Business Notice.

A bulletin on rural line construction recently issued by the Kellogg Switchboard and Supply Company, Chicago, Ill., will prove of interest at this time to telephone men who are interested on the subject.

It is carefully illustrated, showing the best practice in setting poles, guying, bracing and wiring; explaining the different wind and other strains, and the importance of careful guying; gives transposition brackets, insulators, arms, arm braces, etc.; tools required in line and telephone work and costs; also the forms and contracts, constitution, by-laws and rules of order generally used by rural companies.

The bulletin will be sent promptly to those interested upon request.

The Telephone in Railroad Operations.

BY W. F. TAYLOR.

Of the Pennsylvania Railroad Company, Altoona, Pa.

The telephone, when first placed upon the market, was restricted in its use because comparatively little was known of its possibilities, both as to development and utility, but as it was the product of a genius and the subject for the study of scientific men, and the experimentation of wizards, we have to-day an instrument which has revolutionized the practices of the business and industrial world, as well as having removed the limits of the social circle, and yet we perhaps only see the telephone in its first stages of development and utilization.

My belief in the use of the telephone for railroad operations as a substitute for the telegraph is doubtless the result of having been either directly or indirectly connected with railroad telegraph service since before the telephone was commercially used, and also because of having some little to do with the essential functions of a transportation company, namely, to handle traffic expeditiously and satisfactorily at a minimum cost.

The commercial world gives probably as much consideration to the time consumed in transporting a ton of freight from New York to Chicago as to the rate charged, and the traveler is less interested in the fare from Boston to St. Augustine than in the time consumed in making the journey, and in consequence railroad managers are careful to provide the necessary road and terminal facilities, and it is likewise essential that operating officers and employes be provided with not only adequate but the most flexible and quickest means of directing and manipulating the movement of traffic on the road, in yards and at terminals.

The telegraph has long since been supplanted by the telephone in the operation of large railroad yards and industrial plants, as it could no longer be used, first, because its operation depended upon those skilled in the art of telegraphing, secondly, because, and perhaps chiefly, it was too slow since the message necessarily passed through one or more hands before reaching the person directly interested, whereas, with the telephone, no intermediaries are required, and thirdly, if intercommunication was restricted to the telegraph, the cost of operation would prohibit its extended use.

The telephone was introduced and used in the operation of one of the largest railroad yards in this country as early as 1880. It was at once recognized as an instrument that could be used by the yard master in transmitting instructions directly to the persons responsible for their execution, and not be subjected to the delays incident to telegraph and messenger service. The use of the telephone has increased with the development of this particular yard until at present there are no less than seventy-seven telephones used in its operation, and the telegraph has been excluded for ten years.

The railroads are providing telephone facilities for the use of the train despatcher in handling the traffic over the road as a substitute for the telegraph, for the reason that it affords quicker means of communicating with the signalmen, trainmen and others directly interested in the movement of the traffic. The fact of communications being conducted more rapidly by telephone than by telegraph is proven by careful observation, which shows that a given amount of work can be done in about two-thirds less time by the telephone than by the telegraph. The advantages of the time saved in directing the movement is apparent, as, for instance, the train despatcher can give more thought to his work and can therefore effect movements which otherwise might be overlooked.

The telephone is also desirable for this class of work because the train despatcher is practically in personal contact with the people with whom he has to deal, and the value of this cannot be overestimated.

The superintendent can also keep in closer touch with the work of the train despatcher and the conditions obtaining on the road, as he can listen to what is going on on the train wire, which is of great value when accidents or other troubles arise which require the undivided attention of the train despatcher. With the telegraph the superintendent, train masters and others in charge of the general operations of the road are obliged to accept second-hand information.

Another advantage the telephone has over the telegraph is that the train despatcher cannot "roast" the poor operator with his rapid transmission, as the operator can talk about as fast as the train despatcher.

The introduction of the telephone on railroads for the purpose of conducting its operations requires the most careful study of the conditions obtaining on the particular section or division of the road on which it is to be used, so that the requirements of the situation can be fully met, and met on a permanent basis. In other words, an indiscriminate and haphazard way of introducing the telephone on railroads will only result in unsatisfactory service, and possibly the defeat of the object to be obtained; the operating conditions and requirements, as well as the electrical conditions of each particular circuit, must be thoroughly studied and the necessary appliances provided, so as to make the telephone circuit as flexible and more efficient than the telegraph circuit.

The telephone was introduced and used in cases supplant the telegraph operator, or eventually make the use of telegraph operators, as a particular class of skilled labor, unnecessary on railroads, but it will never remove the necessity of railroad companies keeping in their employ in the signal tower, and at all other points where the telegrapher is now a necessity, thoroughly competent and efficient employes, and it may even be necessary to raise the standard of their employes in this branch of the service. The telegraph oper-

ator therefore need not fear that his position as an individual will be taken from him.

The telephone will in a comparatively short time entirely supplant the telegraph in railroad operations, except in cases where it is more economical to use combination telephone-telegraph circuits than to provide a simple telephone circuit. There is no reason why the telephone should be any more unreliable or uncertain than the telegraph, nor should there be any more errors of transmission in the one case than the other. If the use of the telephone has proven a failure in any branch of railroad service, it would seem to us unfair to charge this failure to the telephone as an instrument of transmitting intelligence, but rather inquire into the conditions obtaining where the failure occurred.

The energies of the telephone engineer have been expended in developing the telephone service on commercial lines, and in consequence but little study has been given by them to railroad requirements and conditions; indeed, the telephone engineer usually endeavors to impress upon railroad operating officers the commercial methods and standards of using the telephone, instead of inquiring into and studying the operating conditions and requirements of the railroad, and as a result it is necessary for the railway people to thoroughly understand themselves what they must have in order to meet their conditions, and then look to the telephone people or manufacturers to meet the situation.

A Fine Tribute to Mr. Ralph W. Pope.

The Electrical World, in a recent editorial commenting upon the twenty-fifth anniversary of the American Institute of Electrical Engineers, has this to say concerning the energetic, faithful and efficient secretary of that body, Mr. Ralph W. Pope:

"Upon this pleasant anniversary it seems peculiarly appropriate to make cordial reference to the services of Mr. Ralph W. Pope, who has been secretary continuously since the annual meeting of May, 1885, Mr. Pope having left the telegraph service at that time to accept his present position. This loyal and faithful service to the Institute, unmatched as to official connection with the body, except in one instance, has probably been more effective than any other factor in all its splendid growth. With serenity and sanity Mr. Pope has held to the steady tenor of his work through a score of administrations; and while many of the presidents are entitled to great credit for what they did, Mr. Pope deserves more credit than anybody else for the escape of the society from many things it did not do. Unfailingly a conservative and preservative force, Mr. Pope may always look back upon the Institute period now closing with just feelings of personal pride and gratification. And now as the Institute moves forward into its next quarter of a century, we can only hope and believe that from the rising generation of electrical engineers it will enjoy the continuance of the enthusiastic support that since 1884 has contributed to bring it to the pre-eminence it enjoys today, as the youngest but the largest of the four great national engineering societies."

A New Telegraph Repeater.

The United States patent granted to Charles E. Davies, chief operator of the Great Northwestern Telegraph Company at Ottawa, Ont., as recorded in our patent column in this issue, reveals the fact that Mr. Davies has constructed a repeater in which transmitters and governors are eliminated, and a direct positive make and break of the main line is obtained, allowing very rapid working without blurring or dropping. There also being no drag. A feature of the instrument is contained in the flexible swing arm, which does not permit the main line to be broken until after the hold down circuit is closed, thereby eliminating all chances for a kick. The strength of the contact of this spring is adjustable by means of a spiral spring. This eliminates the general complaint, against instruments which contain a flexible spring as a double contact, that the flexible spring weakens after use and that the "open" contact is poor. This repeater permits an instantaneous "break" and having few parts is cheaply constructed.

"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.

When President Taft gives the signal from the White House that will flash across the continent and start the wheels whirring at the Alaska-Yukon-Pacific Exposition, June 1, his hand will press a telegraph key made of virgin gold, studded with the first nuggets taken from the Discovery claim in the Klondike. A large nugget, which is set on the key bar, was the first found on bed rock in the claim, and the twenty-two nuggets which stud the exquisite jewel were in the poke brought out by the discoverer, George W. Carmack. The base upon which the instrument rests is white Alaska marble, and the button on the key lever, which is set off with a nugget, is of walrus ivory.

Wireless Telegraphy in the American Republics.

Mr. Russell Hastings Millward, in an article in the April Bulletin of the International Bureau of the American Republics, on the subject of wireless telegraphy, has this to say in part:

"That the American Republics have fully appreciated the true value of the wireless telegraph and its application to their social and commercial interests is demonstrated by the rapid advances that have been made in the equipment and operation of the numerous stations established during 1908. Nearly every seaport of importance in South and Central America has adopted the wireless, and stations for many of the inland towns have been projected and are now in course of erection. Such a variety of systems and codes have been put into operation, however, that considerable discord has arisen in the exchange of communications, and conditions are such that an agreement must be reached between the several governments and private companies concerned whereby messages can be freely exchanged, in order to bring about the most satisfactory results.

"When this much desired arrangement shall have been effected, it will be possible to establish communication, through a series of relays, between any two cities of importance on the American continent. New York would then, for instance, be able to transmit a message by wireless telegraphy to Punta Arenas, Strait of Magellan, a distance of 6,890 miles, with probable relays at West Indies, Para, Rio de Janeiro, Montevideo, and Bahia Blanca, via the east coast; and to Valparaiso, a distance of over 5,000 miles, with probable relays at Washington, or West Indies, Colon, Guayaquil, and Iquitos, via the west coast.

"Although Mahlon Loomis secured a patent for a form of wireless telegraphy in 1872, Marconi has been credited with having obtained the first patent on "radio-telegraphy," or "wireless," as it is commonly called. This patent was issued in 1896, since which time nearly 700 patents have been recorded in the United States alone. An active interest was not taken in the invention until 1898, and the first company formed in 1900, so that practically within the eight years of its history perfection has been attained and communication established by wireless telegraphy with every civilized nation.

"Messages are transmitted by what is known as the "radiation of electro-magnetic waves." The operation is not wireless, however, in its entirety, as these waves are conducted through a connection to a series of overhead wires known as the "antennae." The antennae either radiate or induct the electro-magnetic waves which are transmitted through the air and which respond to the tuning of the apparatus at either station where communication is desired. By tuning, messages can be sent and received at any point within the radius of the influence, and between any two or more stations where connection is required or established. The range of radiation of the waves covers about the same distance in every direction, and is regulated by the adjustment of the instruments. It is proven that these waves travel as fast as light, or approximately 168,000 miles, or nearly seven times around the world, in one second.

"By transforming dynamic electricity into static high potentials are obtained, and electro-magnetic waves transmitted great distances through space, frequently 3,000 or 4,000 miles, without difficulty.

"In sending a message, a key similar to the regular telegraph instrument is employed, and, through the agency of electrical forces and the air, connection is made with any station within the radius, and the communication received by an instrument similar in appearance to the telephone receiver used at central or exchange stations.

"Wireless telegraphy has many apparently mysterious qualities for which scientists have been unable to satisfactorily account to the layman. Failure to operate, on account of the conditions of the atmosphere, has been the chief source of annoyance. Another fault, and one which has recently been remedied, is in the absence of secrecy in transmitting messages. Lightning and other electrical disturbances have also caused some inconvenience, but, in the event of a storm, the apparatus is now usually grounded in order to prevent injury. It is reported that lightning will seriously injure, if not entirely destroy, instruments, even though it might strike at a point 5 or 10 miles distant.

"These elements of unreliability and disappointment are now disappearing, however; the confidence of the public has finally been won, and the near future will see the wireless on a substantial and conservative commercial basis.

"Why the wireless has worked better at night, or in cold weather rather than in hot; why transmission is better on the Pacific Ocean than on the Atlantic; or why communication is better in one direction rather than in another, have all been puzzling questions, but are now fully accounted for. A careful investigation of the subject will disclose the simplicity of the methods employed and remove the veil of mystery which has for some time appeared to envelop the wireless problem.

"An authority states that:

"Wireless methods of transmitting intelligence are of a special value in tropical, heavily wooded, or mountainous countries, for the following reasons:

1. There is no line of poles to be kept up, and no clear road to be made.

2. When any trouble occurs it is in the stations, and not possibly several hundred miles away, and so does not require the sending out of special men to make repairs.

3. It is less expensive as regards first cost and, once set up, costs very little to maintain.

4. One station can communicate with any number of other stations, which, it operated by wire, would require a special line to be run in each case. This prevents interruption of communication, for if one station should

meet with an accident the communication can be carried on by other stations; that is, a break at one point does not mean the total breakdown of the entire line of communication.

Until recently telegraphy has not been a commercial success in tropical and semi-tropical countries for two reasons—first, the great absorption of the electrical waves during daylight; secondly, inability to receive messages through atmospheric disturbances.'

"In 1905 reliable communication was established between the stations at Para and Breves, in Brazil, by using a long wave length to overcome the daylight absorption, and also by using strong signals to overcome the atmospheric disturbances.

"A means has now been discovered, however, of entirely overcoming atmospheric disturbances, and during the past year numerous experiments have been made between Great Britain and Massachusetts, which have proven that communication can be maintained both day and night through all atmospheric disturbances. As a result of this valuable discovery, the United States has contracted for the erection of a station at Washington, D. C., which will establish communication both day and night and in all kinds of weather over a distance of 3,000 miles. By this same system a chain of six stations, working over distances of from 500 to 1,200 miles, throughout the West Indies and Central America, has been contracted for, and will be guaranteed to work both day and night and through atmospheric disturbances, giving the same regularity of service as cables.

"The Argentine government has established a number of wireless stations along the coast, which have been operated with flattering success. Among the principal points may be mentioned Buenos Aires, Rio de Santiago, Recalada lightship, at the mouth of La Plata River, Campo de Mayo, and Bahia Blanca. At Cabo Virgines, Ushuaia, on the island of Tierra del Fuego, and several other points high-power apparatus is being installed.

"The government of Bolivia has taken under consideration the equipment of several high-power wireless telegraph stations.

"Brazil has taken more than an active interest in wireless. Stations have been established by both the government and private companies, and will be found at Para, Santarem, Manaos, Rio de Janeiro (2), Ilha Grande, Fort Santa Cruz, Ilha das Cobras Ilha Mocangue, and Villegagnon, where government and public business is accepted. Ponta Negra, Ilha Raza, Guarabiba, and a number of other stations are to be completed and opened for business shortly.

"The Brazilian government has undertaken the gigantic task of connecting the Amazon territory, telegraphically, with the southern districts; but, owing to the nature of the ground to be traversed and the probable time required to complete the work, slow progress is being made, and wireless telegraphy has been suggested as the only system adapted to the situation, and one which could be rapidly installed at reasonable expense. The length of this line, as contemplated, will be about 1,200 miles. In Brazil the telegraphic system is not regarded as a source of revenue of the treasury, the main object of the government being to facilitate as much as possible the use of the telegraphs and to connect all the most distant parts of the republic. Arrangements have been concluded between the government and the telegraph companies, and hereafter all the lines will be united so far as the working is concerned.

"The Chilean government has erected stations at the island of Juan Fernandez, over 400 miles from the coast, and Valparaiso, which have been most satisfactorily operated. A station is also to be equipped with high-power apparatus in the Strait of Magellan, probably at Punta Arenas.

"In Colombia a station at Santa Marta has been opened and a high-power equipment installed, and in connection with a contract made in 1906 for the management and operation of the telegraph systems of the republic it was provided for a theoretical and practical school of instruction in wireless telegraphy to be established at Bogota.

"The government of Costa Rica has established a station at Boca del Colorado, which is now open for both government and public business. The United Fruit Company also has a station at Puerto Limon for the purpose of intercommunication with their other stations and the public business. This is said to be one of the best equipped and most efficient stations in Central America.

"In Cuba the following wireless stations have been completed, inspected by the chief signal officer, Army of Cuban Pacification, and accepted by the Cuban Government: Pinar del Rio, Santa Clara, Morro Castle, Havana, and Nueva Gerona, Isle of Pines. Stations at Camaguey, Baracoa, Santiago de Cuba, Bayamo, Havana, Guantanamo, and Cape San Antonio are also completed and open for government and public service.

"The right to establish and operate the wireless station at Cape San Antonio was granted in 1907 to the United Fruit Company, which is also authorized to make connections with other wireless stations making up the system and with those vessels of the company which may be equipped with wireless installations. The company binds itself to receive and transmit at the station, free of charge, messages to and from vessels belonging to the Cuban and United States Governments and the naval and military stations of the United States.

"In part recompense for this service the Cuban government will transmit over its land lines all of the company's messages from Pinar del Rey to the large plantations it owns and operates at Banes and Preston free of charge.

"The United Fruit Company has about sixty steamers engaged in the transport of fruit from

the West Indies and Central America to the United States, and there are usually forty of their ships in the Caribbean Sea and the Gulf of Mexico at a time.

"It is proposed to so enlarge the system that all the ships of the company may be in constant range of some shore station.

"The United States, Costa Rica, Nicaragua and Panama have all granted the necessary licenses for the complete installation of stations.

"The Dominican Republic will have two stations for the purpose of conducting government business and intercommunication between ports. These stations are located at Santo Domingo City and Santiago. It is proposed to establish a third station on the northern coast, probably at Monte Cristi. When the chain is complete, communication can be rapidly effected between all the surrounding islands.

"Guayaquil and Isla de Puna are two projected stations for Ecuador and will be equipped with high-power apparatus.

"A contract was approved, under date of December 9, 1908, authorizing the establishment of a wireless telegraph station in the immediate vicinity of the city of Tegucigalpa and various substations along the coast of Honduras.

"Probably in no other country has the wireless been more satisfactorily operated than in Mexico. Stations are now in operation at Cabo Haro, Santa Rosalia, Mazatlan, San Jose del Cabo, Payo Obispo, and Xcalac, and a number of others have been projected and are in course of erection.

"The United States government has installed a station with a range of over 500 miles at Swan Island, off the coast of Nicaragua, and the United Fruit Company has active stations at Bluefields and Rama, which are both of high efficiency.

"At Colon, Canal Zone, Panama, the United States Government has a high-power equipment in operation, and the United Fruit Company has a station at Bocas del Toro erected for the purpose of intercommunication with their various stations.

"The Peruvian government has stations at Puerto Bermudez, Massisea, Iquitos, Requena, and Orellana, all open for government and public business, and in 1907 an appropriation of $35,000 was made for the establishment of extended wireless connections through the Montaña or forest region on the eastern slopes of the Andes.

"In Uruguay stations at Montevideo and Punta del Este have been opened for the public service. A high-power equipment is installed at Montevideo and fitted for communication with any ship or station on land without regard to the system. The government of Uruguay is constructing a station on Lobos Island, which will include a residence for the staff, installation of a siren, etc.

"At Willemstad, Island of Curarao, the Netherlands government has established a wireless station with a range of 300 miles and open for both government and public business. This station will also be used for intercommunication with projected stations in Venezuela.

"The United States Navy has in operation two stations in Porto Rico, San Juan and Culebra, which are both open for government and public business.

"The destiny of a nation depends more upon its commercial influence than any other known power, and the position wireless telegraphy will occupy as a potent factor in the future of the American Republics is far beyond any human speculation."

The Determination of the Distance and the Direction of a Sending-Station by Means of Barretter Measurements.

BY BELA GATI OF BUDAPEST, HUNGARY.

In the collision of the steamers Florida and Republic, on January 23, the advantages and usefulness of wireless telegraphy were proven, but its value in such instances would be greatly enhanced if by means of automatic signals it were made possible for the sinking ship to give notice of its distance and direction to other vessels. In case the telegraph operator should sustain injury a sailor could give the letter t at one minute intervals, and this would quite suffice to determine the distance and direction of the imperiled ship. Of course, if the other ships are fitted up with any system of the so-called directive antennas, the matter hardly needs more explanation. I desire to illustrate a case, however, when the rescuing ship has only an ordinary antenna.

According to Duddell's rule, the distance between sender and receiver, multiplied by the strength of the incoming current, is a constant quantity. This rule was proved by Duddell for long distances and is also true for short distances. Should, for example, this constant be 10,000 kilometer-microamperes, at a distance of fifty kilometers we would get two hundred microamperes; at a distance of forty-seven kilometers we would get 212.7 microamperes, and at a distance of fifty-three kilometers we would get 188.6 microamperes. These values can be easily measured by the pointer galvanometer of the Gati barretter measuring set.

As an example, suppose the rescuing ship measures the incoming current and finds it to be two hundred microamperes, and after running three kilometers along its original course the current again measures two hundred microamperes, the rescuer knows that she is not nearing the ship, needing assistance. If she then directs her course perpendicularly to the former one, and after running three kilometers gets 212.7 microamperes, she will know that she is going in the right direction and that the distance to the other ship is forty-seven kilometers. The distance of the imperiled ship can always be determined by calculations made from two measurements taken on two different courses. It is not even necessary to

know the constant, but this can be proved by repeated measurements. If the ship asking for aid does not maintain her emission of waves at a constant strength, measurements must be taken repeatedly.

It would by all means be a good idea to examine all wireless stations in regard to Duddell's rule. The constant gives, so to speak, the efficiency of the station. Although damping measurements have only been taken into consideration since 1906, and the proposed constant measurement has not been put into use up to the present time, still it seems as though the former ordinary aversion of the wireless companies to measurements has been largely overcome. In the interest of the passengers as well as of the companies, as with wave lengths, compulsory measurements in this line ought to be introduced.

Lincoln's Last Day.

In Leslie's Weekly of April 15, appears a lengthy, illustrated article, under the title of "Alonzo Chappel's Long-Lost Painting of Lincoln's Last Day." This article was prepared by David Homer Bates. The picture is a wonderfully vivid and impressive representation of the scene at Abraham Lincoln's deathbed. Of the forty-seven persons shown only five are living. Among them is General Thomas T. Eckert, who is quoted as having this to say on the subject:

"On the night of April 14, 1865, about eleven p. m., while in the act of shaving, on the second floor of my residence on Thirteenth Street, near F, I heard the street door open violently and Operator Thomas A. Laird calling my name and saying, 'The President has been shot at the theatre.' Hurriedly wiping the lather from my face, I put on my coat and started on a run for Secretary Stanton's house, on K Street, first telling Laird to hurry to the War Department telegraph office and give the news to Manager Bates or whoever was on duty, and ask him to summon all available operators for duty. Upon reaching K street, I saw a crowd in front of the house, and learned that Secretary Stanton had just left for Secretary Seward's house, on Fifteenth Street. Arriving there, I found great excitement prevailing, the Secretary of State and his son Frederick and Nurse Harrison all having been nearly killed by Lewis Thornton Payne. I then left for Tenth Street, the scene of the greater tragedy, where Mr. Stanton had preceded me, and had taken full charge. Knowing how eager the country would be for authentic news, the secretary wrote a despatch, addressed to Major-General Dix at New York, for distribution to the press, giving a brief account of what had occurred, which was sent immediately to Mr. Bates for transmission. Other despatches were sent at intervals during the night and until the President died, when the final bulletin was written and the assembled watchers dispersed, to resume their respective official duties under the burden of their great loss. Secretary Stanton left General Vincent and myself to see to the removal of the body to the White House, which took place at about 8.30 a. m."

An Interesting Publication.

The April issue of the Bulletin of the International Bureau of American Republics is one of the best numbers, both in appearance and contents, that has ever been published. A great variety of interesting miscellaneous matter is printed in this number, including an article on "Wireless Telegraphy in the American Republics," the keynote of which is the near possibility of direct and highly efficient international communication between the capitals and important cities of any two republics in the Western Hemisphere. It is difficult to conceive the rapid progress made in the construction and equipment of wireless stations in all parts of North, Central, and South America in the year 1908, as described in this article. Major J. Orton Kerbey, an old-time and militarv telegrapher, contributes an article for the same issue on "Para, the State, and Para the City, at the Mouth of the Amazon." It will be a revelation to the average American that about one hundred miles below the Equator is a modern and progressive city of 200,000 people, the starting point for river navigation on the Amazon for a distance of 2,300 miles, and the shipping port for the bulk of the rubber production of the world, the larger part of which is used for insulating purposes.

The Hudson Word Counter Again on the Market.

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 of this useful article 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.

The telegraph system of Portugal at the end of the year 1905-6 had a total of 9,392.3 kilometers of line and 21,226.4 kilometers of wire. The total number of offices open was 506. The traffic consisted of 1,480,285 telegrams sent, 1,700,066 received, and 3,178,569 in transit, making a total of 6,358,920 telegrams—an increase of 5.96 per cent. over the previous year.

THE ASSOCIATED PRESS.

The tenth annual meeting of the Associated Press occurred in New York April 14, and was the largest attended of any gathering since the organization of that body was effected. An unusually large amount of routine business was transacted. The proposed change in the by-law relating to the hours of publication was postponed for another year, on account of lack of the necessary members being present to vote on the change, a vote of four-fifths of the members being required to pass an amendment. The present by-law reads:

"The time limit for the receipt and the publication of news by members shall be (standard time in all cases at place of publication) as follows: morning papers to receive not later than five a. m. and to publish between eleven p. m. and eleven a. m.; afternoon papers to receive not later than four p. m., and to publish between eleven a. m. and eleven p. m.; provided, that the board of directors may authorize that upon extraordinary occasions the Associated Press despatches may be used in extra editions or for bulletins outside of the hours named."

The proposed substitute by-law was as follows:

"The time limit for the receipt and the publication of news by members shall be (standard time in all cases at place of publication) as follows: morning papers to receive not earlier than four p. m. and not later than nine a. m., and to publish not earlier than six p. m.; afternoon papers to receive not earlier than six a. m., and not later than six p. m., and to publish not earlier than nine a. m., except that for Sunday editions to be circulated outside of the city of publication morning papers may publish not earlier than five p. m. The service to afternoon papers between four p. m. and six p. m. to be of a bulletin character; provided, that the board of directors may authorize that upon extraordinary occasions the Associated Press despatches may be used in extra editions or for bulletins outside of the hours named. Where available, delivery of the night report to afternoon papers and the day report to morning papers shall be permitted at such time and under such conditions as may be determined by the board of directors."

The old board of directors was re-elected, and J. R. Youatt was elected treasurer to succeed Herman Ridder. Mr. Melville E. Stone was re-elected general manager.

Mr. J. R. Youatt, of New York, who has been auditor of the Associated Press for many years, was elected treasurer of that organization by the board of directors at their annual meeting held recently. Mr. Youatt's election is a signal recognition of his long and faithful service as auditor.

The Associated Press is contemplating the establishment of a distributing station at Seattle, to meet the needs of that rapidly-developing section of the country.

The Railroad.

The Train Despatchers' Association of America, which holds its annual convention at Columbus, Ohio, June 15, 16, 17 and 18, will make its headquarters at the Great Southern Hotel in that city.

The Illinois Central, G. H. Groce, superintendent of telegraph, has established a telephone train despatching circuit between New Orleans and Canton, Miss., and the Mississippi, Tennessee and Louisville divisions will all be similarly equipped within a short time.

Mr. J. Beaumont, formerly signal engineer of the Panama Railroad, has been appointed superintendent of telegraph, telephones, signals and electric light and power, to succeed Willis J. Rodman, deceased. Mr. Beaumont will have jurisdiction over all electric work on the Panama Railroad.

Reinforced concrete telegraph poles have satisfactorily stood the test to which they were subjected the past winter on the Pennsylvania Railroad west of Pittsburg. Though their cost and installation is greater than that of wood in poles, the additional investment is compensated for by the reduced expense of maintenance.

Among recent New York visitors were: Mr. W. J. Camp, electrical engineer of the Canadian Pacific Railway Company's Telegraph, Montreal, and president of the Association of Railway Telegraph Superintendents; S. A. D. Forristall, superintendent of telegraph, and E. A. Smith, superintendent of the Fitchburg division of the Boston and Maine, Boston, Mass.; N. E. Smith, superintendent of telegraph of the New York, New Haven and Hartford, New Haven, Conn.; W. F. Williams, superintendent of telegraph of the Seaboard Air Line, Portsmouth, Va.; W. C. Walstrum, superintendent of telegraph of the Norfolk and Western, Roanoke, Va., and W. P. Cline, superintendent of telegraph of the Atlantic Coast Line, Wilmington, N. C. These officials had been in attendance at the Philadelphia quarterly meeting of the eastern committee of the Association of Railway Telegraph Superintendents.

The quarterly meeting of the eastern committee of the Association of Railway Telegraph Superintendents took place at Philadelphia, Pa., April 15, Chairman Charles Selden of Baltimore presiding. There was a full attendance of the eastern members, among those present being Charles Selden, E. W. Day and A. Stevens, of Baltimore; J. B. Fisher, Philadelphia; W. F. Williams, Portsmouth, Va.; W. P. Cline, Wilmington, N. C.; E. P. Griffith, L. B. Foley, F. G. Sherman and A. B. Taylor, New York; W. H. Potter, Washington; C. M. Lewis, Reading, Pa.; W. C. Walstrum, Roanoke, Va.; W. J. Camp, Montreal; E. A. Smith and S. A. D. Forristall, Boston, and J. S. Stevens, Richmond, Va. The proposed new constitution and by-laws were taken up and discussed and are now in shape to be presented to the full association at its annual meeting at Detroit in June. The Pennsylvania Railroad Company extended the courtesies to the committee in affording them a convenient assembly room for their meeting, and they were entertained at a company luncheon, Mr. J. B. Fisher being the host of the occasion.

An unusually interesting program is being prepared for the annual convention of the Association of Railway Telegraph Superintendents, which meets at the Hotel Pontchartrain, Detroit, June 23, 24 and 25, by John L. Davis of Chicago, chairman of the committee on topics. J. G. Jennings of Chicago, superintendent of telegraph of the Chicago, Rock Island and Pacific, will present a paper on "The Necessity of Censoring Railroad Telegrams." This will be discussed by F. E. Bentley of the St. Louis Terminal Railroad, St. Louis, and S. K. Bullard of the Missouri, Kansas and Texas, Denison, Tex. "The Difference Between the Trouble Shooter and a Division Lineman" will be outlined by H. D. Teed of St. Louis, superintendent of telegraph of the St. Louis and San Francisco Railroad. G. A. Dornberg of Pittsburg, superintendent of the construction department of the Pennsylvania lines West of Pittsburg, and W. P. Cline of the Atlantic Coast Line, Wilmington, N. C., will take part in the discussion of this paper. S. L. Van Akin, assistant superintendent of telegraph of the New York Central, Syracuse, N. Y., will tell of "The Advantages and Disadvantages of Using Cable in Bringing Telephone and Telegraph Wires into Local Offices." G. H. Groce, of the Illinois Central, Chicago, will lead the discussion, and he will be followed by I. T. Dyer of the San Pedro, Los Angeles and Salt Lake, Los Angeles.

"Efficient Office Organization" will be the subject presented by E. H. Millington of Detroit, superintendent of telegraph of the Michigan Central. J. B. Sheldon of the Union Pacific, Omaha, and B. F. Frobes of the Oregon Short Line, Salt Lake City, will discuss Mr. Millington's paper. The subject of "Telephone Construction" will be presented by J. C. Kelsey. F. H. Van Etten of the Southern Indiana, Chicago, and R. L. Logan of the Kansas City Southern, Kansas City, will discuss Mr. Kelsey's views from the railroad standpoint. E. J. Little of St. Paul, superintendent of telegraph of the Great Northern, will tell of the "Benefits of Standards in Telegraph and Telephone Construction." His paper will be discussed by G. C. Kinsman of the Wabash, Decatur, Ill., and F. S. Spaford of the Chicago, Rock Island and Pacific, Chicago.

F. H. Loveridge will speak on "Dry Batteries," and C. J. Fry of the Chicago, Milwaukee and St. Paul, Milwaukee, and W. C. Walstrum of the Norfolk and Western, Roanoke, Va., will take part in the discussion. William Maver, Jr., of New York, the electrical engineer and well-known authority on the subject, will present a

paper on "Wireless Telegraphy." C. S. Rhoads of the Cleveland, Cincinnati, Chicago and St. Louis, Indianapolis, and F. G. Sherman of the Central Railroad of New Jersey, New York, will open the discussion.

"Wire Testing" will be presented by V. T. Kissinger of Lincoln, Neb., assistant superintendent of telegraph of the Burlington system. W. F. Williams of the Seaboard Air Line, Portsmouth, Va., and W. P. McFarlane of the Chicago and Northwestern, Omaha, will discuss Mr. Kissinger's paper.

The president of the association will be at liberty to call upon any of the other members to take part in the discussion of the papers presented. In fact, after each paper has been read and the subject discussed in a formal manner, any member who wishes to express his views on the matter at issue will have the opportunity to do so. The object of the committee on topics in appointing two members in advance to discuss each paper presented is to afford ample time and opportunity to thoroughly digest the views expressed and to answer them in a manner that best illustrates the points mentioned to fit the needs of the members of the association. The secretary of the association is Mr. P. W. Drew, of the Wisconsin Central, Chicago, to whom communications concerning the convention should be addressed. Mr. E. H. Millington, of the Michigan Central, Detroit, is chairman of the committee on arrangements.

A bill was recently introduced in Congress by Representative Hardwick of Georgia, providing for the licensing of railroad telegraph operators, and the fixing of their hours of labor and wages.

Mr. P. W. Drew, superintendent of telegraph of the Wisconsin Central, which was recently absorbed by the Soo Line, has been appointed the superintendent of telegraph of the Chicago division of the Minneapolis, St. Paul and Sault Ste. Marie, with headquarters at Chicago, the name of the Wisconsin Central having been changed to the Chicago division of the Soo Line.

Judge Kenesaw M. Landis, of Chicago, in an important decision April 21 upheld the federal "hours of labor law" and decided that the government had won its case against the Atchison, Topeka and Santa Fe Railroad. The government charged the railroad with employing telegraph operators at Corwith, Ill., for a longer period than nine hours out of twenty-four. It was established that while the operators worked only nine hours out of twenty-four in the aggregate, they worked in broken shifts of twelve hours each, with a rest period of three hours in each twelve. The case was submitted to the jury on one count of the complaint. By stipulation of counsel for both sides a verdict of guilty was returned and a fine of $100 was imposed.

A meeting of railroad, telegraph and telephone officials took place in Philadelphia on April 14 to discuss the damage done by recent storms and means of preventing similar trouble in the future. The gathering was held under the auspices of the Pennsylvania Railroad Company, and was attended by thirty officials interested in the matter of maintenance of telegraph and telephone communication. A summary of the effects of the sleet storm of March 4 was given by the representatives of the various wire-using companies represented. The ideal type of aerial construction was discussed, and it was the general consensus of opinion that the poles should be as short as possible and so spaced as to materially reduce the length of the spans. Various types of poles were discussed, such as A poles and H poles of wood, concrete poles and metal poles.

The matter of underground construction was also discussed in a general way and the difficulties of rendering efficient service through cables of such lengths as would be required for commercial and railway telegraph service were brought out, together with the enormous expense involved, if the existing wires were placed in underground cables. The Pennsylvania Railroad Company served an elaborate lunch to those present, in the main dining-room of the Broad Street station.

Those in attendance were: P. L. Spalding, general manager Bell Telephone Company of Pennsylvania, Philadelphia, who acted as chairman of the meeting; Nathan Hayward, chief engineer, Bell Telephone Company of Pennsylvania,; W. W. Mulford, special agent railways, F. A. Stevenson, superintendent of the plant department, and H. W. Drake of the American Telephone and Telegraph Company, New York; T. L. Ingram, general superintendent Southern Bell Telephone and Telegraph Company, Atlanta, Ga.; E. B. Pillsbury, general superintendent, and C. A. Lane, superintendent of construction Postal Telegraph-Cable Company, New York; C. H. Bristol, general superintendent of construction, Western Union Telegraph Company, New York; O. Edmonson, general foreman of construction, Western Union Telegraph Company, Philadelphia; W. E. Harkness, sales manager, R. F. Spamer and H. L. Burns of the Western Electric Company, New York; Charles Selden, superintendent telegraph, E. W. Day, assistant superintendent of telegraph, and Albert Stevens, general line foreman, Baltimore and Ohio Railroad Company, Baltimore; C. M. Lewis, superintendent of telegraph, Philadelphia and Reading Railway, Reading; Dr. Paul R. Heyl, instructor Central High School, Philadelphia; J. B. Fisher, superintendent of telegraph, J. C. Johnson, chief clerk to superintendent of telegraph, W. S. Logan of the superintendent of telegraph's department, M. Keily, general foreman, superintendent of telegraph's department, and W. H. Denny, foreman of linemen, Philadelphia Terminal Division, all of the Pennsylvania Railroad Company, Philadelphia; W. F. Taylor, division operator, Altoona; William Ettenger, division operator, New York Division, Jersey City;

H. F. Smith, division operator, Delaware Division; H. L. Husted, division operator, West Jersey and Seashore Railroad; James Donnelly, division operator, Baltimore Division; H. Logan, division operator, Philadelphia Terminal Division, and F. D. Gardner, chief operator, Buffalo and Allegheny Valley Division.

The School of Railway Signaling.

The School of Railway Signaling, Utica, N. Y., was incorporated in February, 1908, and began giving instruction on July 1 of the same year.

The school now has over three hundred and fifty students in various parts of the United States and Canada. It has also received numerous inquiries from foreign countries, including South Africa and India. Its object is to teach railway signaling by correspondence, and it thoroughly covers every feature of this interesting branch of engineering. Perhaps the best evidence of the success of the school is the great number of letters received from its students, all of whom appear to be highly satisfied with their association with the school.

The present school is the outcome of a night school which Mr. H. C. Williams, Signal Supervisor on the Harlem Division of the New York Central, conducted for the benefit of the men in his department. At a later date Mr. Williams was promoted to the office of Signal Supervisor of the Mohawk Division of the same railroad, and started a night school at Utica. Both these schools were highly successful, but neither of them were sufficient to supply the demand for instruction, and it was decided to start a correspondence school.

The present officers of the school are: H. C. Williams, president; F. B. Harrington, vice-president; H. M. Cooper, secretary; H. W. Palmer, treasurer; F. C. Lavarack, director of instruction; O. G. Brown, manager; C. J. Gomph, registrar, and M. W. Shuler, general agent.

The courses offered by the school are fully explained in a twenty-page catalogue, which is sent free on request.

The school also has an advisory board composed of fifteen signal engineers connected with leading railway systems throughout the United States, all of whom are co-operating with it in its efforts to further the science of signaling.

The Late W. B. Dougall.

The recent death of William B. Dougall, which is recorded in our obituary column in this issue, who was for many years superintendent of the Deseret Telegraph Company of Utah and connected with that company from its beginning in 1866 until its absorption by the Western Union Telegraph Company, about five years ago, prompts a close associate of his for many years, Mr. Josiah Rogerson of Salt Lake City, to tell of some of the experiences of Mr. Dougall during the early years of his life. Mr. Rogerson learned the art of telegraphy from Mr. Dougall during the late sixties, and though he himself is nearly seventy years of age is still engaged in active service for the Western Union Telegraph Company.

He says in part as follows: "In the early sixties Mr. Dougall drove a four-mule team from Salt Lake to Los Angeles as one of the freighting teamsters, who annually made the trip every winter for merchandise, over 1,600 miles. In the spring of 1866 President Brigham Young determined to have a telegraph line in Utah, sent the cash necessary, with the emigration teams for the wire, instruments and insulators, which were freighted by the ox-teams that season from Omaha and reached Salt Lake City the following September and October.

"In the fall of 1865 President Brigham Young ordered a selection to be made of one young man from every prominent town and settlement in the territory, reputed for his scholastic attainments, to come to Salt Lake as a member of a telegraphic school to be taught that winter by John Clowes, then manager of the Western Union Telegraph office, which had been established at Salt Lake since 1861. William B. Dougall and a dozen more were selected and made up the class, and here commenced the practical and useful life of the deceased.

"He studied the art for six months and distinguished himself afterward as a practical telegrapher, manager and superintendent for over thirty years.

"In the summer and fall of 1866 the Deseret telegraph line was built and finished from Salt Lake to Logan in Cache valley, and to St. George in Washington County, Utah, and the boys that had attended Clowes' school the winter before were distributed and made managers of the various offices north and south, William B. Dougall being left in charge of the office at Parowan, Iron County.

"Taking charge of the Parowan office about the middle of December, 1866, he remained there only a short time, and in July, 1867, he succeeded Mr. Wilkinson as manager of telegraphs in President Young's office, which position he held for the next ten years.

"Thirty-five years of the best part of his life was spent in Salt Lake City as telegraph operator, manager and superintendent, and in this vocation he had been known for more than anything else, ranking among the best anywhere as a solid, careful operator and not lacking in skill or speed. He had the reputation among those who knew him well of being punctual in all his duties and faultless and accurate in his financial responsibilities."

A telegraph operator reported for duty in one of the offices recently, more or less under the influence of drink. His companions noticed that he had a placard on the back of his overcoat which read, "C. Q. D., Can't Quit Drinking."

Obituary.

Captain George C. Burnell, Signal Corps, U. S. A., a native of Vermont, shot himself in a sanitarium in Laurelton, Md., and died April 21, aged forty years. He was in charge of the construction of the Signal Corps telegraph system in Alaska, and this hard service was in a measure responsible for his nervous collapse.

George A. Clark, chief operator of the Western Union Telegraph Company at Galveston, Texas, died of heart disease in that city, April 7, after a two months' illness. Mr. Clark was born at Lancaster, Ohio, February 26, 1849. He entered the telegraph service in 1867, at Cincinnati, going thence to New Orleans. Twenty-five years ago he transferred his services to the Galveston office, where for many years past he has acted in the capacity of chief operator. Mr. Clark was a Christian gentleman, and his death is regretted by a large circle of friends in Galveston, and by all telegraphers who ever worked for him. By his loss the Galveston force is bereft of a considerate and just chief, as well as a kind friend.

William Bernard Dougall, a pioneer telegrapher of Utah, and the organizer of the school which ultimately developed into the Latter Day Saints University, died at his home, in Salt Lake City, April 12, of a complication of liver and kidney troubles. Mr. Dougall was born in Liverpool, Eng., May 3, 1843. He joined the Mormon church at the age of 10 years and emigrated to Utah in 1853. In 1866 President Brigham Young called upon him to learn telegraphy. His first position was with the Deseret Telegraph Company, which Brigham Young constructed throughout Utah, and of which Mr. Dougall afterward became superintendent. He held this position for many years and until its consolidation with the Western Union Telegraph Company about five years ago. Mr. Dougall was an active member of the Mormon church, having at one time been one of the presidency of the high priests quorum. He married Maria Young, a daughter of Brigham Young, in 1868. He is survived by his wife and three children.

Norborne M. Booth, aged eighty-six, and a forty-niner of the telegraph, who for several years past had lived in retirement, died at Evansville, Ind., on April 9. Mr. Booth was born in Louisville, Ky., where he entered the telegraph service in 1849. He was a member of the school of telegraphers who learned the art in Kentucky, in the late forties, all of whom honored the profession by invention, management, or in literature. Among his associates were Dr. Norvin Green, James Francis Leonard, George W. Trabue, Benjamin F. Ely, John C. Van Horne and others. He was manager of the Western Union Telegraph Company at Evansville from 1871 until 1884, when he resigned to engage in the electrical business. Mr. Booth connected Shippingport and Portland with the Southwestern Telegraph office in the fall of 1856, and in 1866 he organized the Ohio River Telegraph Company, and connected the towns on the river from Louisville to Shawneetown, Ills., crossing that river with his cable four times. Mr. Booth represented Telegraph Age at Evansville for upwards of a quarter of a century, and he was a frequent contributor of old time reminiscence to its columns.

Bark Affects Penetration of Wood Preservatives.

The Government has gone into the study of every phase of wood preservation, and as progress is made in new experiments, important facts are brought to light which heretofore have been given little or no attention. One of the features in the work of wood preservation which has been neglected is the effect of patches of inner bark on wood in preventing proper penetration of preservatives.

Before timber is subjected to preservative treatment, it is customary to remove the bark. Unless this is done very thoroughly, however, patches of the inner bark will remain on the wood. This thin inner bark or skin adheres very closely, and is difficult to remove without the use of a drawing-knife, unless the timber is cut when the "sap is going up."

Until recently, it does not seem to have been realized that this bark presented a very effectual hindrance to the penetration of creosote. In conducting some tests on the treatment of pine in Louisiana and Alabama, in 1907 and 1908, it was noticed by a representative of the Forest Service that very little or no creosote entered the wood through even the thinnest layer of adhering bark.

The same thing was discovered by the management of one of the large creosoting companies in the South, and steps were immediately taken to see that every particle of bark was removed. While it is probable that the bark of all species is not as resistant as that of pine, it is not known how the different species rank in this respect.

In the creosote treatment it is rarely that the entire stick is penetrated by the preservative. The value of the treatment consists largely in the creating of an exterior antiseptic zone around the untreated interior portion. If this outer zone be broken, the value of the treatment is to a large extent lost.

It is proposed, at the meeting of the Chambers of Commerce of the British Empire to be held at Sydney, New South Wales, in September next, to offer a resolution to the effect that an important development in the direction of imperial commerce would be facilitated by a reduction of telegraphic charges within the empire, and that the respective postal departments of the various governments be requested to bring forward a combined scheme for substantial reductions in telegraphic rates within the empire, so that this matter may be treated apart from the telegraphic conference. That the decisions arrived at be communicated at and form part of the programme of the next imperial conference.

LETTERS FROM OUR AGENTS.

DULUTH, MINN., WESTERN UNION.

This office handled over three thousand messages of protest to Governor Johnson the day after the passage by the state legislature of the bill taxing iron ore, mined in this State, five cents per ton.

The Duluth Mining Stock Exchange has been reorganized and will begin operations within the next thirty days. With excellent prospects of success, Manager Crane is endeavoring to secure enough subscribers to install a ticker service circuit in this city.

Lake navigation having opened the marine circuit has been placed in commission with Duluth, Detroit, Toledo and Cleveland, offices working direct. Mrs. Lulu Hart has been assigned to the wire in this office.

Manager C. A. Crane accompanied the Knight Templars on their pilgrimage to Minneapolis April 28.

PHILADELPHIA, POSTAL.

Among the recent visitors to this office was Miss Alice Deasey. Miss Deasey, who is employed as an operator on the Panama Railroad, is here on a visit to her parents and expects to return to Panama about the middle of May.

Mr. Philip Riley, manager of the office in the wholesale wool district, was married to Miss Kathryn Ryan, on April 21.

Mr. John J. Jefferies, for a number of years assistant to the chief clerk in the service department, has been appointed receiver, vice Miss Mabel Roberts.

Mr. George W. Dunn has the sympathy of his frineds in the death of his wife which occurred recently.

NEW YORK, WESTERN UNION.

Miss Flora St. Jacques, formerly of the free service bureau, and a sister of Hector St. Jacques, of the Barclay department, was married on April 19 to Mr. Albert Gagnon of Ottawa, Ont.

OTHER NEW YORK NEWS.

Assessment No. 402 has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of John H. Thornton, at Pittsfield, Mass.; John C. Massa, at New York; Joseph Marks, at Oroville, Cal.; John Wood, at Auburn, R. I., and Joseph S. Swan, at Brooklyn, N. Y.

Entertainment of the Electrical Aid Society, of Philadelphia.

The ninth annual entertainment, dinner and dance under the auspices of the Electrical Aid Society, of Philadelphia, was given at Mercantile Hall, the evening of April 21. Prior to the dinner a vaudeville entertainment was presented, which the audience greatly enjoyed. Colonel Joseph S. Green, who has been in the telegraph service since 1846, was the guest of honor at the dinner, sitting with his daughter, Miss Lillian M. Green, opposite the president. A pleasing feature of the gathering was the presence of a great number of telegraph employes, every branch of the service, from the delivery department to the superintendent's office being represented.

There were about 700 in attendance and the entertainment ended with dancing by the younger people.

The entertainment was in charge of Ralph G. C. Carr, chairman; John A. Chapman, Geo. Steible, Charles A. Huver, Katharine A. McTague, Jennie O'Neill, M. N. Redding, George D. Carney, William S. Stewart, Nellie F. Hayes, Carrie F. Calhoun and Richard H. Conway.

Officers of the society are: president, Andrew S. Weir; vice-president, W. R. Harmstad; recording secretary, W. E. Vanarsdall; financial secretary, R. C. Murray; treasurer, H. W. Hetzel; executive committee, the officers, ex-officio, and Frank E. Maize, Anna R. Foster, George J. Wells and Mary McFadden; trustees, George J. Wells, R. H. Conway and H. C. Leahy; auditing committee, C. M. Christine, Clara M. Hart and H. Wobensmith.

Paris Telegraph and Telephone Conference 1910.

Among the subjects which will be discussed at the second international conference of telegraph and telephone engineers to be held in Paris in 1910 are the following: Co-existence of circuits carrying strong and feeble currents on adjoining lines, methods of preventing inductive and other influences; wooden poles, new processes for preservation by impregnation and other productive methods, descriptions of practice; party lines and selective signaling on telephonic and telegraphic circuits; telegraphic systems for heavy traffic; multiplex machine telegraphs and the Mercadier system.

United Press and Associated Press in Legal Conflict.

The United Press Associations on April 5 secured a temporary injunction from the Circuit Court of Cook County, Ill., restraining the Associated Press from compelling, directly or indirectly, the St. Louis Post-Dispatch or any other Associated Press newspaper to refuse to receive the news reports of the United Press over the latter's own wires. The Western Union Telegraph Company was also restrained from removing its wires from the newspaper offices.

This move, following so closely on the action of the Associated Press directors at their meeting, when they brought the Toledo News-Bee and Chicago Journal, two Associated Press members, up on charges of supplying news, which the association laid exclusive claim to, to the United Press, suspending the News-Bee and dismissing the charges against the Journal, on condition that it give up the United Press service, makes it seem that the order to remove the

wires and operators of the United Press from Associated Press newspaper offices was more general than was at first supposed.

The suit involves the right of an Associated Press paper to receive news by wire in its own office from another press association. Internal trouble between the two press associations, it was rumored, had been going on for some time and at the 1908 annual meeting of The Associated Press it was expected that some action would be taken. At that time there was some discussion over the matter of leakage of news, but as no action was taken at the meeting the matter was thought dismissed, and nothing more was heard of it by the outsider until the recent action of the directors.

The United Press complaint in the suit charges the directors of the Associated Press with maliciously and wrongfully designing to injure the complainants and prevent members of the Associated Press from taking the United Press service, and compel afternoon papers, which really rely on the United Press service, to print only such news as the management of the Associated Press saw fit to send out.

It also charges that the Associated Press is trying to cause the United Press loss of members.

The complainants say that they are using the Post-Dispatch case as a test case, because after its suspension it had even tried to compromise with the Associated Press by discharging all the authorized United Press operators and employing their own for running the latter's wires. It says this did not even appease the Associated Press, which insisted on the removal of all United Press wires and all apparatus belonging to it.

The Associated Press claims the cases of the Toledo News-Bee and Chicago Journal have nothing to do with the suit, the Post-Dispatch being suspended for an open violation of the by-laws and constitution of the Associated Press, which forbids any paper holding membership in the Associated Press from having wires or operators of another news service in its building.—Fourth Estate.

General Mention.

The Japanese government telegraph department announces that its telegraph offices in Manchuria, viz., Shinminfu, Taikozan and Taitoko, are closed. There are, however, Chinese offices in these localities. The Chinese government has opened new telegraph offices at Anshunfu, Shihlung and Gwongchow in the provinces of Kweichow, Kwangse and Honan.

Mr. W. W. Vyle, on his recent retirement from the position of superintending engineer of the Post Office Telegraphs, South Wales district, was presented with a roll-top desk and a barometer, and also with a gold brooch for Mrs. Vyle. There was an attendance of about three hundred and fifty of Mr. Vyle's friends and associates at the presentation. Mr. Vyle is succeeded by Mr. R. McIlroy, from the engineer-in-chief's office, London.

The Hungarian telegraph system in 1907 increased from 24,329 kilometers of line and 130.958 kilometers of wire to 24,638 kilometers of line and 136,694 kilometers of wire. The number of offices increased from 3,925 to 4,040. Besides 6,679,893 internal telegrams, 1,781,341 international telegrams were accepted for transmission, and 1,661,763 were received. Transit traffic accounted for 585,239 telegrams, so that the total traffic was 10,708,236 telegrams—an increase over 1906 of 680,784.

Mr. J. Hervey Nichols, of Denver, Colo., an old-time telegrapher, and one of the most prominent members of the United States Military Telegraph Corps during the Civil War, in renewing his subscription recently, expressed his opinion as follows:

"I read your paper with a great deal of pleasure and congratulate you heartily on the able manner in which it is conducted. The electrical fraternity will yet rise up and bless you."

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North American Telegraph Co., H. A. Tuttle, general manager and purchasing agent, Minneapolis, Minn.
Postal Telegraph-Cable Co., Executive Offices, 253 Broadway, New York; purchasing agent, W. D. Francis, 14 Desbrosses St., New York.
Postal Telegraph-Cable Co. of Texas, S. M. English, general manager and purchasing agent, Dallas, Tex.
Western Union Telegraph Co., Executive Offices, 195 Broadway, New York; purchasing agent, H. E. Roberts, 152 Franklin Street, New York.

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No. 10 NEW YORK, MAY 16, 1909 Whole No. 624

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The price of "Pocket Edition of Diagrams," etc., is $1.50.

PHILLIPS CODE.

The popularity of the Phillips Code, by Walter P. Phillips, was never more apparent than at the present time. Its acceptance by the telegraphic fraternity, as a standard work of the kind, dates from its first publication, and the constantly increasing demand for this unique and thoroughly tested method of shorthand arranged for telegraphic purposes, has necessitated from time to time the issuance of several editions. The present edition was carefully gone over under the supervision of Mr. A. P. Velie, an expert press and code operator, for many years identified with The Associated Press, New York, a few revisions made and a number of contractions added, until now this "stanch friend of the telegrapher" is strictly up-to-date in every particular. It has been declared that an essential qualification of a "first-class operator" was a thorough understanding of Phillips Code.

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.

"Telegraphers of To-day," illustrating the personnel of the telegraphic profession, as it existed in 1894, with more than 900 biographical and historical sketches of leading members of the craft, is a unique and valuable work; it has become standard, being the only work of the kind extant. It contains 354 double-column pages 7 x 11 inches in size, has gilt edges and is bound in imitation morocco.

Of this fine publication, becoming more and more valuable as times passes, we have but a few copies left. The original price was $5. In order to readily dispose of these remaining volumes, and place them where they rightfully belong, in the hands of every telegrapher who failed to secure a copy at the higher original price, we have cut the figure to $2 a volume, express charges prepaid. At this low rate, a sum about the cost of binding the book, no telegrapher who desires to own a copy should fail to obtain one at this time, for this "bargain" price will probably never be repeated.

The life of Prof. S. F. B. Morse, is the standard work, authorized by the Morse family, and compiled from original papers and other authentic data in their sole possession. It is a clearly written biography, charmingly told by a trained newspaper man, a close personal friend, and presents the life of this great inventor of the telegraph in a broader, more intense, human and truthful attitude than ever before attempted or even made possible; 775 pages, illustrated; sheepskin binding. The original price was $6, which we have reduced to $3, on receipt of which the book will be sent, express charges prepaid.

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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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TELEGRAPH AGE

No. 10. NEW YORK, MAY 16, 1909. Twenty-sixth Year.

CONTENTS.

SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

The Telephone.

PART IV.

A telephone outfit permanently connected in one circuit extending between two terminal points obviously has a limited field of usefulness, as one can only converse with such persons as are on that particular line.

In order that a person may use the telephone more generally and widen the conversational field so as to reach others similarly connected in other circuits we have what is called a telephone "exchange." An exchange is the central office of some telephone system at which point connections are made, by means of which two persons possessing telephones on separate circuits are placed in communication with each other.

In order to make such connections the exchange outfit consists principally of a switchboard containing many springjacks, arranged side by side, cords, etc., like, or similar to those shown in Figure 1 of the accompanying illustrations.

A glance at the upper detailed figure in the diagram will show the general construction of such a springjack, its connection with the two-line wires, and the manner of inserting the metal plug, the cord of which connects other apparatus in the circuit.

The middle part of the figure shows the central operators listening outfit, which is inserted in the circuit by means of the cords and plugs.

It will be seen that when no plug is inserted the lever, to which the line is attached, rests normally on the contact point, which makes con-

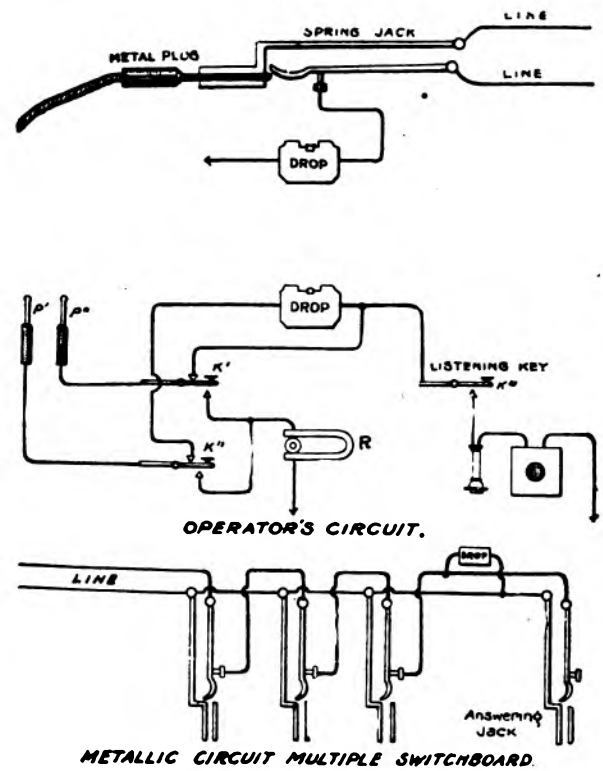


FIGURE 1.

nection to the drop or annunciator, and through that to the ground. When the plug is fully inserted the insulated tip thereof raises the line lever from the contact point, thereby leaving the latter open. The annunciator is located on the main switchboard and indicates to the operator when a subscriber wishes a connection made.

When so signaled the operator inserts one of the pair of metal plugs, belonging to the outfit, in the calling circuit and depresses the key which cuts in her listening telephone. After ascertaining the connection, the subscriber wishes, the op-

erator inserts the companion plug in the circuit asked for and after conversation begins opens the listening key, which act cuts out the listening in telephone. When the subscribers are through talking, the hanging up of their telephones causes the drop in the operators' circuit to fall, and thus announces that the connection may be discontinued.

The lower part of Figure 1 shows the general plan of arranging the springjacks in what is called a multiple switchboard.

SIMULTANEOUS TELEGRAPHY AND TELEPHONY.

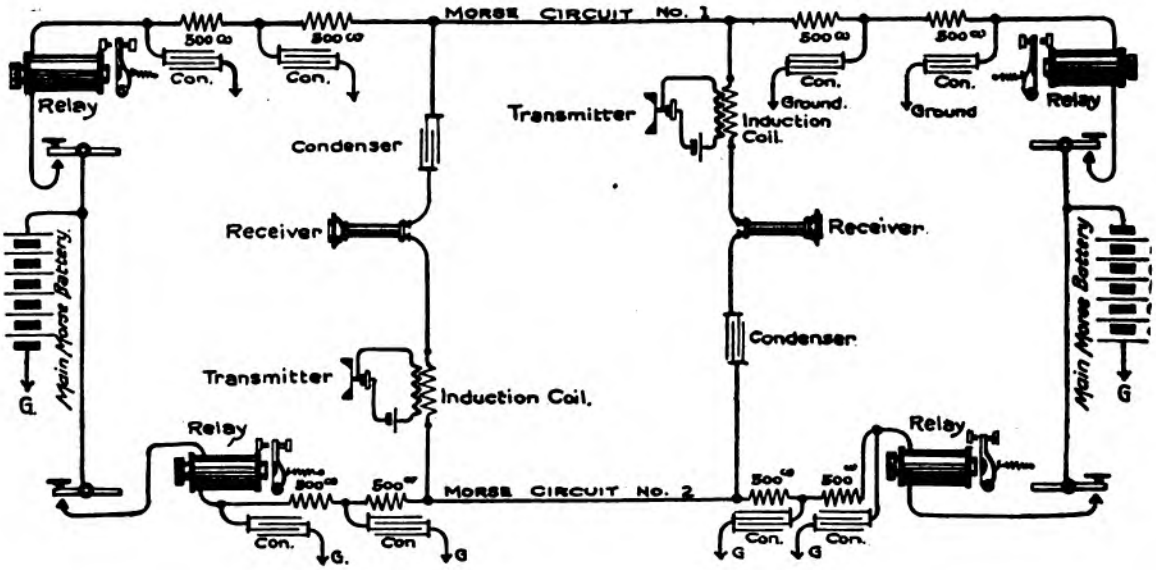
While simultaneous telegraphy and telephony may seem like a very difficult operation to accomplish, the arrangement after all is rather simple.

If the readers will glance at the diagram, Figure 2, he will see that the telephones have a metallic circuit apparently the same as in the other arrangements previously described. Two telegraph wires are used for the conductors and the telephones are connected, making up the telephonic circuit through condensers across the two like rungs in a ladder, as shown in the middle portion of the diagram. The condensers prevent the Morse from flowing through the telephone receiver, but the telephone impulses pass through them unchecked. The whole scheme centers in eliminating from the telephone receivers all noises due to the making and breaking of the current in the two Morse telegraph circuits. The first move in this direction is to select two telegraph wires which are as near alike in size, resistance, and otherwise, as possible, in order that the two sides of the telephone circuit may be approximately evenly balanced, and thereby inductive effects originating in the Morse circuits may be minimized.

The next step is to diminish the rapidity with which the current in the Morse circuits rises and falls to maximum and minimum value respectively while the operator is sending. When the rise and fall is very rapid the sudden jerk the diaphram of the telephone receives creates a noise in the latter, while a retarded or gradual rise and fall does not produce any appreciable noise.

In most systems of this kind the method devised by Van Rysselberghe or some modification of it is generally used.

It is a well-known fact that the presence of an electro-magnet in a circuit tends to retard the current in building up to its final value. If, in addition to such coils, condensers are added and the arrangement is made such as shown in Figure 2, it has been found that the rise and fall of the Morse current will be so graduated that almost perfect quiet obtains in the telephone. When this has been accomplished, the telephone current may be easily superposed upon the Morse current with no ill effect apparent to either telegraph or telephone operation.



The Van Rysselberghe system of Simultaneous Telegraphy and Telephony—Theory.

FIGURE 2.

Recent Telegraph Patents.

A patent No. 918,866, for electric transmission of intelligence, has been granted to I. Kitsee, of Philadelphia, Pa. For transmission of alternating or varying currents by means of a line comprising conductively independent conductors arranged in inductive relation, and associated conductor in an inductive relation with the said conductors and an earth connection for the associated conductors.

A patent No. 920,034, for a telegraphic transmitter, has been awarded to P. Dinger, of Cleveland, O. The main vibrator has a fixed weight with a stem and contact adjusting device connected with the key under spring tension so as to

impart acceleration to the vibrator for making sharp dots.

Personal.

M. Carlos Torrico has become Director-General of Posts and Telegraphs of Bolivia.

M. Chas. Follert has been appointed Director-General of Posts and Telegraphs, of Hungary, to succeed M. P. de Szalay, deceased.

Mr. Henry D. Reed, president of the Bishop-Gutta Percha Company, New York, and a forty-niner of the telegraph, celebrated the fiftieth anniversary of his wedding at his home, Roseville, N. J., on May 14.

Mr. J. H. Wade, Jr., who a few days ago made an ascension in the balloon Cleveland, from North Adams, Mass., is the son of Jeptha H. Wade, of Cleveland, Ohio, the third president of the Western Union Telegraph Company.

Mr. H. H. Matlock, an old time Illinois telegrapher, and a member of the United States Military Telegraph Corps, during the Civil War, who has spent the winter at Thomasville, Ga., has returned to his home at Springfield, Ill.

Mr. C. L. Buckingham, of New York, formerly patent attorney for the Western Union Telegraph Company, and the inventor of the Buckingham printing telegraph system, has been confined to his home several weeks by illness.

Mr. Frank Brookfield, treasurer of the Brookfield Glass Company, New York, manufacturers of telegraph insulators, was married on April 28, to Miss Marceline Randolph Dunning. Mr. and Mrs. Brookfield will enjoy a wedding trip of six months abroad.

Mr. Orrin S. Wood, the pioneer telegrapher, although in his ninety-second year and in feeble health, has gone to his country home at Turner, Orange County, New York, to spend the summer, as has been his custom for many years. Mr. Wood, who was the brother-in-law of Ezra Cornell, entered the telegraph service on August 6, 1844, on the original telegraph line erected between Washington and Baltimore for the United States Government by Mr. Cornell.

Canadian Pacific Railway Telegraphs.

In addition to the new telephone train despatching circuits which we noted in our March 16 issue, the Canadian Pacific Railway telegraphs will erect a copper wire for telegraph purposes from Winnipeg to Field, B.C., a distance of 971 miles; another copper wire for telegraph use will be erected from Calgary to Cranbrook, a distance of 276 miles, making in all 2,500 miles of new copper wire which will be put up by the company during the coming summer.

The Canadian Pacific Railway have also just completed the erection of a copper wire from Toronto to Sudbury, via Muskoka, in order to give the Queen City a wire to Winnipeg, independent of Montreal. The company is also engaged in rebuilding over 600 miles of pole lines in different parts of the system, besides which several hundred miles of new wire will be spread over the western provinces, and many new offices opened.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Mr. Ralph E. Bristol, storekeeper of the supply department in this city, whose resignation was reported in a previous issue, to engage in other business, will embark in the cement manufacturing industry at Ogden, Utah, where he will act as secretary and treasurer of the Ogden Portland Cement Company.

Mr. M. T. Cook, secretary to and son of Theo. P. Cook, general superintendent at Chicago, has been appointed general agent of the Western division of this company and of the American District Telegraph Company.

Mr. W. N. Fashbaugh, electrician of the Eastern division, is acting superintendent of the third district at Pittsburg, Pa., vice E. B. Saylor, resigned.

Mr. A. Carlson has been appointed traveling auditor, to fill the vacancy caused by the death of Leonard Cox. Mr. J. A. Sweeney, of the money transfer office, has been made assistant traveling auditor.

Orton Brewer, son of A. R. Brewer, treasurer of the company, has been elected assistant secretary of the Wabash Railroad Company.

The company is establishing many sub-telephone stations in various cities and towns throughout the country where telegrams can be filed and are telephoned to the main office.

Mr. Charles M. Holmes, the executive messenger, has the sympathy of his friends in the death of his wife, which occurred on April 25. Pneumonia following an attack of cerebral apoplexy, was the cause of death. Grief over the death of her son, William Holmes, which occurred about five months ago, brought on her fatal illness.

Mr. D. Ogden, manager of the Columbus, Ind., office, which position he has held for fourteen years, has resigned to enter the automobile business, and is succeeded by J. J. Lash, formerly manager of the Postal office at the same point.

Miss Rose Klein has been appointed manager at Kingston, N. Y., vice H. R. Cook, resigned.

Mr. H. L. Burrows has been appointed manager at Waco, Texas, to succeed S. Renick, resigned.

Mr. B. A. Hughes, division traffic chief of the San Francisco office, has resigned to accept a position as secretary to Mr. C. W. Root, assistant engineer of the construction department of the Western Pacific Railway Company at Winnemucca, Nev.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mr. Clarence H. Mackay, president of the company, accompanied by Mrs. Mackay and daughter, sailed for Europe on the Kaiser Wilhelm II., May 4, to be absent two months.

Mr. Charles C. Adams, second vice-president of the company, made a trip recently to Philadelphia and Baltimore in the interest of the service.

Mr. Charles P. Bruch, third vice-president of the company, who has been absent from his office for ten weeks with typhoid fever, is again at his desk.

Mr. E. B. Pillsbury, general superintendent of the Eastern division, was in Buffalo and Pittsburg last week on company business.

Mr. W. A. Houghtaling, of the Rowland Telegraphic Company, Baltimore, Md., was a recent visitor, coming here in the interests of his company.

Mr. E. B. Pillsbury, general superintendent of the Eastern division, took possession of his new suite of offices on the ninth floor on May 3, which was the fifty-third anniversary of his birth. Mr. Pillsbury occupies the room at the corner of Broadway and Murray Street. Mr. L. Lemon, division superintendent, has the adjoining room on the Murray Street side, and Mr. Edson Kimmey, district superintendent, occupies the adjoining room on the Broadway side of the building. The chief clerk, clerks, and others identified with the Eastern division, are provided with ample space and accommodations in adjacent offices, the suite being well planned for the purpose of expediting the business of the company.

Mr. S. B. Haig, superintendent of traffic, now occupies the office on the tenth floor, vacated by General Superintendent E. B. Pillsbury. Mr. W. I. Capen, general superintendent of plant, has taken possession of the office adjoining the one occupied by Mr. Haig.

The Ashland, Ore., office, which is a repeater station for circuits between San Francisco and Portland and Seattle, has been undergoing important improvements, and an up-to-date dynamo plant has replaced over 1,000 cells of gravity battery.

Joseph Wright has been appointed manager at Columbus, Ind., to succeed James J. Lash, resigned.

Municipal Electricians.

A patent No. 919,179, for a fire alarm, has been issued to Joseph S. Jones, of Spokane, Wash. Two contact terminals of a fire-alarm circuit are separated by a spring-tensioned cord which, when destroyed by fire, releases the alarm.

In Chicago about 90 per cent. of all the alarms of fire are sent to the fire department first by telephone and later, if there is a fire of any magnitude, by "pulling" a fire-alarm box. The Chicago Telephone Company sends monthly reports of these telephone fire calls to the chief of the fire department, and in general keeps in close touch with the department in the matter of transmitting alarms. During 1908 there were 8,724 "fire calls" transmitted by telephone in Chicago, the number ranging from 522 in May to 1,154 in August. During the same year there were 53,982 "police calls" by telephone, varying from 3,505 in January to 5,334 in September.

The Telegraph in Panama.

BY OTTO HOLSTEIN, OF CERRO DE PASCO, PERU.

With the exception of a few brief notes taken from a report of the Isthmian Canal Commission and published in "Telegraph Age" some months ago, the writer has never seen printed any reference to the telegraph on the Isthmus of Panama. Trusting that some of your readers will be interested in further details, I take pleasure in sending you the following. Let me say, however, that these notes will be found absolutely correct only to May 12, 1908, on which date I severed my connection as an inspector in the Telegraph and Telephone Department of the Panama Railroad to go to South America.

From Colon, on the Atlantic side of the Isthmus, to the City of Panama on the Pacific, along the line of the Panama Railroad, the distance is approximately 47 miles. There are two pole lines, one being designated as the "Panama Railroad Route," and the other as the "Canal Route," but inasmuch as the latter carries telephone wires alone it need not be considered. It might be well to state here that all telegraph and telephone lines and installations on the Isthmus are under the direction of the Superintendent of Telegraph of the Panama Railroad, and only a few months ago the lighting plants and other electrical work which formerly came under the supervision of the electrical department of that road were transferred to the Telegraph and Telephone Department. There are a few offices such as the Chief Engineer's office in Culebra, the Isthmian Canal Commission office in Cristobal, Major Jadwin's office in Gorgona and the various Isthmian Canal Commission offices in the city of Panama, whose operators are employed by the Canal Commission, but the majority of the operators, linemen, inspectors and others engaged in telegraph work on the Isthmus are employed by the Panama Railroad.

The line under consideration follows the route of the Panama Railroad, and is of very substantial construction. Old iron rails, relics of French days, are used for poles, but beyond this feature, the line does not differ materially from first-class construction in the United States. The pole line carries from 25 to 30 wires, the greater part of which are given over to the telephone system. There are five telegraph wires operated by the Railroad Company and the Commission; one is assigned to the Train Despatchers' use, one for railroad business, one is a block wire, and two are given over to the Canal Commission, although railroad business is also carried on over them. Three wires are leased to the Central and South American Telegraph Company. Two of them form a link in their New York-Buenos Aires cable and are, of course, worked with the usual cable instruments (siphon recorder, etc.), the third wire leased by this Company is worked with the usual Morse instruments, but the universal alphabet is used, and the wire is employed to trans-

mit local business between the Colon and Panama offices of the cable company.

The American Morse alphabet is used on all railroad and government wires, and most of the operators are Americans, although a few Frenchmen and one or two Jamaicans, who have been in the service of the railroad since French times, remain. A better and more efficient lot of operators than those on the Isthmus it has never been the writer's pleasure to meet.

There are forty-one telegraph offices, and standard equipment is used. The relays, originally 150 ohm instruments, have had their coils connected in parallel, reducing their resistance to thirty-seven and a half ohms. On the railroad block wire twenty ohm sounders are used, and a change-over switch is installed, allowing the operator to work in either direction on the same key by merely moving the switch. Storage batteries are installed at Colon and Panama, and supply current for all lines except the block wire, which is supplied by gravity batteries installed in each block. The chemical action of these gravity batteries is extremely vigorous, and on account of rapid evaporation and some salts contained in the water for making up the electrolyte, the salts of zinc form so rapidly and the electrolyte evaporates so quickly that these batteries require attention about every two weeks to keep them in good condition.

Strip and plug switchboards are used only at the terminal offices while spring jack boards are used at way-stations with jack plugs corresponding to the various table sets. This arrangement has been found very satisfactory as at certain seasons the atmosphere is very humid and moisture collects on everything. Escapes and weather crosses have been found less liable to occur with the spring-jack boards than with the strip boards. There are also other advantages in the use of the spring-jack board, which are well known by all who have had to do with telegraph work.

Junction boxes are provided on the poles at every telegraph office, into which all telephone wires are brought. These boxes and the underside of the platforms beneath them are favorite nesting places for wasps, and the writer has had many interesting and exciting experiences with them. At quite a number of stations the wires are brought into offices for the purpose of testing. It can readily be seen therefore that with forty-one offices in forty-seven miles trouble can be located very closely by the ordinary simple tests.

The telegraph and the telephone service on the isthmus is thoroughly up to date, and is carefully supervised and cared for, and speaks well for the officers and men charged with its maintenance and operation.

The general character of the country from Colon as far as Bohio is more or less swampy. From Bohio on to Panama the country is generally higher. One of these swamps between Bohio and Lion Hill and very close to the abandoned station, Ahorca Lagarto, known as the Black Swamp, presented an apparently unsurmountable difficulty not only to line construction, but even to the construction of the railroad. As fast as telegraph poles were placed they would sink out of sight in the mud, and although rails were spliced together the same thing always happened, and it was decided that the swamp was well-nigh bottomless. As a matter of fact, there is no evidence yet to prove the contrary. Finally a plan was tried which appears to be a perfect success. A number of poles were spliced together and a concrete collar fixed about thirty feet from what was to be the top. In this manner the pole line is virtually floated through the swamp.

As may well be imagined, the country on every hand is a jungle, with the exception of where clearings have been made for the extermination of the mosquito or for canal work. There is a bird in the swampy country between Bohio and the Atlantic that insists on building its nest on the poles. The nest is a cumbersome thing of twigs and grass and when wet forms an excellent escape for the current via the iron pole to ground, or a cross between two wires. It takes the entire time of one man to keep these nests cleared from the poles.

Expensive operation of Canadian telegraph systems, especially in the Yukon and northern British Columbia, due to damage to lines from snow slides, rock slides and blizzards, may bring about the installation of wireless systems where wire troubles are most prevalent.

The Strike in France Renewed.

The telegraphers and postmen of Paris again went on strike May 12, and the government finds itself confronted with a problem that it ought to have solved six weeks ago when the previous strike was inaugurated as a protest against the government's substituting merit for priority as a basis of future promotion. The men returned to work under the impression that they had won their point, but as a matter of fact the government made no promise, and at once began vigorous preparations for the renewal of the struggle which the officials realized must soon occur, and be fought to a finish. In the meantime the telegraphers' organization, with other trade unions, declared that they were no longer responsible to law and government, but to the proletariat. It is this revolutionary declaration that the government has now to face.

More than 56,000,000 gallons of creosote and nearly 19,000,000 pounds of zinc chloride were used in preserving timber in the United States last year. Small quantities of crude oil, corrosive sublimate, and other chemicals were also used. These figures are based upon reports to the United States Forest Service of forty-four firms, which operated sixty-four timber treating plants.

The Use of the Wheatstone Bridge in Locating Line Troubles.

BY J. P. EDWARDS.

Division Electrical Engineer, Postal Telegraph Cable Company, Atlanta, Georgia.

I am frequently requested to furnish some simple sketches and illustrations of the proper method of using the Wheatstone bridge in locating line troubles, troubles in cables, etc. The following methods of making measurements may prove of value to those interested in such work.

First of all, in using the Wheatstone bridge, be sure, in closing the keys to close the battery key approximately a half second in advance of the galvanometer key. In any Wheatstone bridge, when balance is obtained, the products of the resistance in circuit in the opposite sides are equal. For instance, on the theoretical diagram, Figure 1, the opposite sides are A and R and B and X, and when balance is obtained A times R will equal B times X, and therefore A:B::X:R.

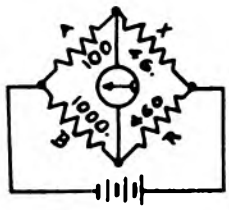


FIGURE 1.

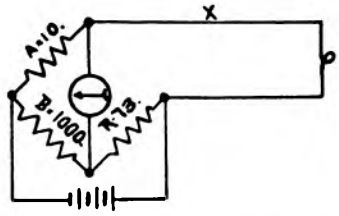


FIGURE 2.

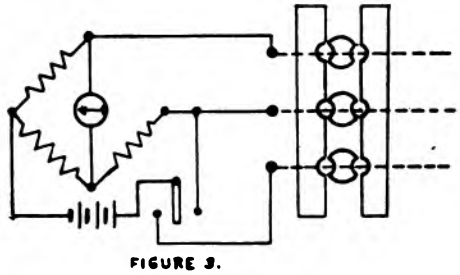


FIGURE 3.

Consequently, if we know any three sides, we can obtain the fourth. Some unknown resistance, composing the X side of the bridge, in actual work, is the side which we want to know the value of; therefore, as A, B and R are known from the reading of these values in the bridge, X, or the unknown side, is equal to A times R divided by B. For example, let Figure 2 illustrate a bridge with an unknown resistance forming the X side, let A equal 10, B equal 1,000, R equal 73; then by the formula given, X equals 10 times 73 divided by 1,000, which gives .73 ohm.

Except in making measurements for cable troubles, and other close determinations, A and B are usually made equal, and generally both A and B are in such cases made 1,000 ohms. No determination of a resistance closer than one ohm is possible, under such bridge arm ratios, but for close determinations, such as those first worked out, the resistance can be accurately determined to the third and fourth decimal.

Bridges as arranged for measuring resistances of telegraph wires are usually wired up with a three-point switch, as shown in Figure 3.

In making measurements for locating any kind of trouble, the wire of lowest resistance per mile should always be placed at the bottom of the bridge. Most telegraph line troubles can be located by measurements made with the arrangement shown in Figure 4, but it sometimes happens that the variation in resistance at a cross is so great that it is not possible to make a location by this method, in which case a third wire should be taken for use in the measurement.

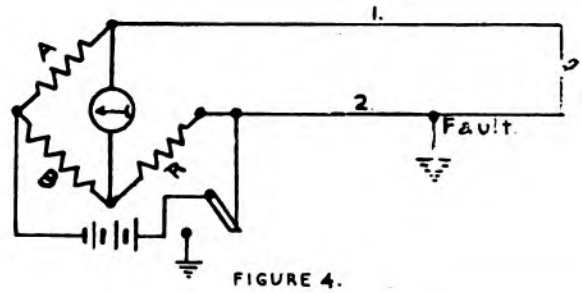


FIGURE 4.

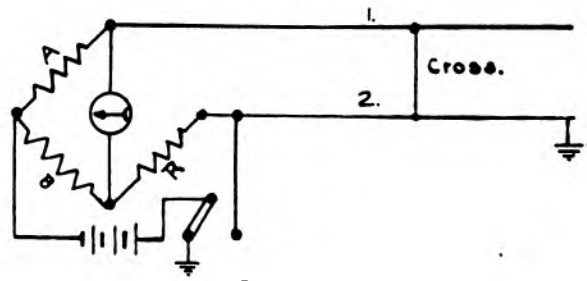


FIGURE 5.

In the first case, that of a ground, proceed as follows: Putting the wire of lowest resistance per mile at the bottom of the bridge, as shown in Figure 4, with the three-point switch to right, A and B being equal, the resistance unplugged in R when balance is obtained, will be the resistance of the loop. Suppose the result to be 630 ohms.

Now throw the three-point switch to the left, which grounds the battery, and the current goes through the ground to the accidental ground on No. 2, which it is desired to locate, enters the loop at the ground on No. 2 and divides in proportion to the resistance over No. 2 and R of the bridge rheostat, as compared with the resistance of No. 2 from the accidental ground to the point beyond it, where No. 1 was looped with No. 2 for purpose of measurement, and the resistance of No. 1, that is, the current divides in proportion to the resistance in circuit, between the fault and the other pole of the battery at the bridge, the two paths available being back over No. 2, and the R side of the bridge on the one side, and out over No. 2 from the fault to where No. 2 is looped with No. 1, and thence back to the bridge, on the other side.

Suppose that in adjusting R, in the second part of the measurement, it reads 270 ohms, when a

balance has been obtained, we are then in a position to determine the resistance, and, therefore, the distance, from the home station to the fault, from the readings of R in the two measurements.

Call the first measurement R and the second measurement R'; the resistance then to the fault along No. 2, which is the unknown resistance, is R minus R', divided by 2, and in this case given is 630 minus 270, divided by 2, which equals 180 ohms. If the known resistance of No. 2 is 4.4 ohms per mile, the distance to the fault is 180 ohms divided by 4.4 ohms, which gives a distance of 40.9 miles.

Similar measurements can be made for locating a cross, using only the affected wires, provided the wire of lowest resistance per mile has no loops or relays in it between the testing station and the cross, which in this case is, say, between Numbers 1 and 2, as shown in Figure 5. Have the distant station open No. 1 and ground No. 2, and proceed exactly as in the case of an accidental ground, to be located, as illustrated previously.

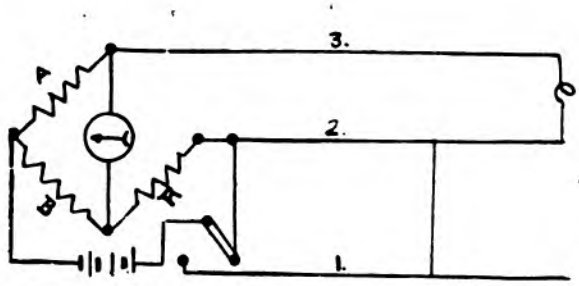


FIGURE 6.

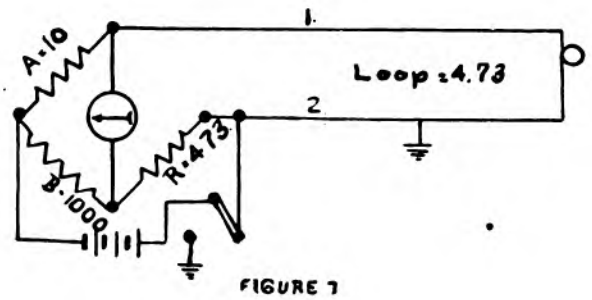


FIGURE 7

In case the cross is unsteady and varies considerably, this method would not give a good location, and a third wire should be used as illustrated in Figure 6. Suppose the cross is still on Numbers 1 and 2, but is varying and unsteady, perhaps due to a high wind keeping the wires in constant motion, take No. 3 and loop it with No. 2 beyond the cross, measure this loop just as in the first case, having No. 1 open beyond the cross and at the home station. Then to get R' put No. 1 to the left hand post of the three-point switch, and balance for R'. The formulas are the same in each case.

By making the arms of the bridge unequal, so as to measure fractions of an ohm, the measurements described are capable of giving excellent results in locating troubles in cables. It will readily be understood, that as in the case of a cable we are dealing with distances expressed in feet, instead of miles, close locations are the only ones of any value.

Make the bridge arm ratios: A=10; B=1,000, and remember the statements regarding the products of the resistances in the opposite sides of the bridge arms, pointed out in the beginning of the article. If the location to be made is that of a grounded conductor, loop this grounded conductor with a good and clear one, at the most convenient point (usually a cable box) beyond the fault. In any event, do not open up the cable in an effort to find a good conductor, somewhere near, but beyond the fault, but make the loop from the first cable box, or available point where the conductors are brought out of the cable, beyond the ground on the affected conductor.

Figure 7 illustrates the measurement. First obtain L, the resistance of the loop, from the formula L, equals A times R, divided by B. Then throw the switch to the left putting the battery to ground and get the second part of the measurement. Say a balance at R equals 443. The formula which gives the resistance to the fault is: B L minus A R divided by A plus B, or substituting the values given in the illustration:

$$\frac{BL-AR}{A+B}=\frac{1000\times 4.73-10\times 443}{1010}=\frac{4730-4430}{1010}=\frac{300}{1010}=.297 \text{ ohms.}$$

Having obtained the resistance to the fault, it is desired to know the distance; this can be obtained by dividing the resistance to the fault by the resistance per foot of the conductor, or by multiplying the resistance to the fault by the feet per ohm of the conductor. The feet per ohm of No. 14 copper, such as is generally used in telegraph cables, is at 60 degrees Fahrenheit, 396; then 396 times .297 equals 117.6 feet.

A convenient check measurement on this method is obtained by reversing the conductors on the bridge, putting No. 2 at the top and No. 1 at the bottom.

The formula for this check measurement is: X, or the resistance to the fault, equals A times L plus R, divided by A plus B.

In the case of the measurement given, which is an actual one, the reading for R in the check measurement was 25.2, the decimal .2 being approximated. The needle of the galvanometer not standing at zero on 25 or 26, the reading was taken from the swing of the needle on these two figures, as .2 more than 25, or as 25.2.

Ten times the sum of L in the check, plus R in the check, equals 10 times 25.2 plus 4.73, or 10 times 29.93, which gives a result of 299.3. Dividing 299.3 by the sum of A and B, or 1010, gives as resistance to fault .296 ohm, and the distance may be obtained by multiplying .296 by 396, giving 117.2 feet.

In the case of a cross to be located in a cable, make exactly the same measurements, but instead

of grounding the battery for the second part of the measurement send it out on one of the crossed conductors, as shown in Figure 6.

All of the methods described are Varley methods, which I find more generally applicable to all classes of measurements than the Murray measurements. The Murray for some work is shorter and simpler, but unlike the Varley depends upon each conductor being of the same size, length and material.

The Cable.

Mrs. S. S. Dickenson, wife of General Superintendent Dickenson, of the Commercial Cable Company, New York, was run down by a street car, and painfully injured, a few days ago.

The cable steamer Mackay-Bennett, belonging to the Commercial Cable Company, which has heretofore rendevouzed at Halifax, N. S., is harboring temporarily on the west coast of Ireland, ready to repair damage that may occur to the cables of the company off the coast of Ireland.

Mr. F. B. Gerrard, superintendent of the Commercial Cable Company's station at Canso, N. S., was a recent New York visitor, coming here on business connected with the service. Mr. Gerrard had just returned from Newfoundland, where he spent a month arranging to establish the new cable station of his company near St. John's, for the landing of the cables which the company had decided to lay to New York from that point. One of the existing cables to Canso will be cut and run into this station forming a direct connection between the New York office and the European stations.

It is claimed that the Newfoundland route possesses two very important advantages over any other route in that it almost equally divides the line between New York and England, making the two arms of the cable of almost equal length which permits the sending of messages at greatly increased speed. The second advantage is that the character of the ocean floor in this locality is such that thousands of dollars can be saved in repairs to cables. The company has perfected an automatic relay system, by which a message passing through Newfoundland can be forwarded without the employment of an operator.

Desire Brun, the representative of the French Cable Company, and the Venezuelan Government have agreed upon a new contract by which the cable company will cede to the Government, as indemnification for the company's complicity in the Matos revolution and as a payment for the new cable monopoly, all of its coast cables, worth hundreds of thousands of dollars, and in return secure a monopoly of cable communication with the outside world for twenty years, with a stipulation that if the Government decides to grant a franchise for wireless telegraphy preference shall be given to his company to install and manage it. It is expected that President Gomez will approve the contract. The French Government has announced that as soon as Venezuela settles with the cable company it will consent to renew diplomatic relations.

The report of the directors of the German Atlantic Telegraph Company, Cologne, Germany, for 1908, says the London Electrical Review, states that although trade and industry still had to suffer from the unfavorable situation of business in the United States, the Atlantic telegraph traffic of the company only slightly diminished; the traffic on the Vigo cable showed a very small decline. Large expenses arose from the interruption of one of the Atlantic cables and the Vigo cable by trawlers' nets and owing to other causes. The question of the damaging of submarine cables by trawlers' nets had been the object of a full inquiry by a special commission of the English Government, and would, it was hoped, shortly be discussed by an international telegraph conference. An avoidance of these damages could only be expected by a regulation of trawl net fishing and the control of the gear. The North German Sea Cable Works, of which the company held one-half of the share capital, had been in full operation since the middle of the year on the manufacture of the cable to be laid to South America, and this degree of activity would presumably continue until June, 1910. The cable works proposed to pay 4 per cent. dividend for 1908, although the amount devolving upon the telegraph company was not brought into the accounts for the year. The financial position is as follows for the past two years:

	1908.	1907.
Share capital	£1,200,000	£1,200,000
Bond capital	955,300	967,000
Gross receipts	228,669	237,470
Expenses and taxes	44,526	43,176
Cable repairs	19,858	938
Cable redemption fund	29,797	29,797
Depreciation provision ..	5,563	5,148
Net profits	128,923	155,902
Dividend	84,000	84,000
" per cent.	7	7
Carried forward	22,271	21,203

The net profits diminished by £26,979 in 1908 as compared with the preceding year, and the allocation to the special reserve and cable improvement fund is only £10,000, as contrasted with £35,000 in 1907. On the other hand, the 4 per cent. dividend in the North German Sea Cable Works, if it could have been included in the accounts, would have yielded £6,000 to the telegraph company for the past year.

Business Notice.

The United States Electric Company on May 1 moved into larger and more commodious quarters at 284-286 Pearl Street, New York. In their new location the company has a light and roomy loft for manufacturing and assembling its Gill selector product, combined with convenient and comfortable business offices, and will be able to handle more promptly its steadily increasing orders.

The Military Telegrapher in the Civil War.

PART XIX.

John A. Cassell, though but a beardless youth at the outbreak of the Civil War, entered the ranks of the United States Military Telegraph Corps in the early part of that memorable conflict, and served his country with unswerving fidelity until the corps was disbanded after the close of the war. In writing to Colonel William R. Plum, historian of the United States Military Telegraph Corps, in 1878, he gave the following straightforward and most interesting account of his experiences:

"I was sworn into the service at Charleston, Va., in November, 1861, by Colonel Tyler of the 7th Ohio Volunteer Infantry, General Rosecrans, afterwards General J. D. Cox, commanding. Nothing of interest occurred during my stay there.

"On February 1, 1862, several operators, myself included, decided to go to Kentucky. On arriving at Cincinnati I was ordered to report at Louisville, Ky. I was there ordered to report for duty to Colonel James T. Bramlette (afterward Governor of Kentucky) at Camp Green on the Cumberland River. I remained in camp until March, 1862, when the command was embarked on steamers for Pittsburg Landing, and I was ordered to open my office at Jamestown, Ky., the extreme outpost, thirty miles from any command or garrison. The country hereabouts was filled with bushwhackers and straggling Confederate soldiers. Several times raids were made into the town and I had to hide myself for protection. I was under many obligations to Mr. Lucas and family for my safety, although they were extremely bitter toward Union soldiers. I remained at Jamestown until about June 1, when I was ordered to report to General George W. Morgan, commanding the Army of the Ohio at Barboursville, Ky. I took the stage via Lebanon to Stanford, Ky., where I secured a horse from Lieutenant Wylie, assistant quarter master, and rode the entire distance, about sixty or seventy miles, alone from Stanford to Barboursville, having in my satchel money to pay off the telegraph linemen employed in constructing military telegraph lines. I remained at Barboursville several days when I was ordered to Flat Lick, Ky., where Major Garber commanded, and where I had great trouble to get anything to eat. I remained there several days when I was ordered to Cumberland Ford, the advance of the army. At this place I was assigned with the line builders and accompanied them to the front. We remained in camp on Second Pine Mountain several weeks, when it was decided to make an attack on Cumberland Gap, and I was ordered to the cross roads six miles from Barboursville, where the command was divided into two divisions, one making a feint in the front and the other taking a circuitous route to the rear. The cross roads was considered a dangerous point and I was left without any protection. I occupied an old dilapidated log building as my office. I remained at the cross roads until after the capture of the Gap and forwarded the following message:

'To Honorable Secretary of War:
Washington, D. C.

The Great Gibraltar of America is ours without the loss of a single man.

(Signed) George W. Morgan,
Brigadier-General Commanding.'

"Nothing occurred at the Gap except the regular routine business. I was next assigned to General S. P. Carter's headquarters, six or seven miles south of the Gap, and the extreme outpost. I accompanied General Carter on several foraging and scouting expeditions acting as an aide, and I assisted in destroying the siege guns at the Gap. On account of continued shelling of our quarters we were finally compelled to move our batteries and office from the Tennessee valley, to the Kentucky side of the mountain for protection.

"On our retreat from the Gap the telegraph line builders and operators were formed into a corps of sappers and miners under command of Captains Patterson and Tidd, and assisted in making new roads, removing blockades and rebuilding bridges which had been destroyed by the enemy who were immediately in our front and harrassing us daily both by skirmishing and blockading. We suffered greatly for food and water having lived on one-third rations for thirty days previous to leaving the Gap and only getting such as the country furnished. For several days we lived exclusively on corn meal grated by making graters out of our tin plates. General Morgan having issued an order the second day out to dismount all but field officers, I fell one of the victims, for which he has my sincere thanks. I naturally fell two days in the rear of the headquarters, and when General Morgan arrived at Portsmouth he found several cipher messages from Gen. Wright, which he could not decipher. I being the only cipher operator with the command, he sent a courier back after me to report at his headquarters, the Biggs House. After translating the messages and presenting William Grooms, operator at Portsmouth, with my tin plate grater as a souvenir, I took the train from Hamden, stopping en route at Camp Johnston, where we met W. G. Fuller, the whole-souled captain of the United States Military Telegraph Corps. He put me in charge of seven or eight linemen with orders to proceed to Louisville with them. I was then ordered from Louisville to Mitchellsville, the advance station on the Louisville and Nashville Railroad, and base of supplies for the army south, the Confederate General, John Morgan, having destroyed the two tunnels just south of this place, blockading the road. After the blockade was removed, I reported to Colonel Smith of the 127th Illinois Volunteer Infantry commanding stockades, etc., along the line of this road, and remained with him until I was ordered to report to General E. A. Paine at Gallatin, Tenn. There were several skirmishes and scares while we were doing road duty, but nothing of importance occurred. We

remained at Gallatin, Tenn., several months, when our quarters were removed to Tullahoma, Tenn., and from there to the Western district of Kentucky at Paducah, Ky. From this place I accompanied General Parsons as cipher operator on an expedition with a fleet of steamers to Clifton, Tenn., where General Schofield's command embarked for the East. I remained with General E. A. Paine until his retirement from the army, when I went to Cairo, Ill., remaining there until the spring of 1865, when I was ordered to Louisville. I remained at this place until the United States Military Telegraph Corps was abandoned, when I entered the employ of the Southwestern and Western Union Telegraph Company."

Mr. L. C. Weir, now the president of the Adams Express Company at New York was a military telegrapher at the beginning of hostilities. In a letter to Colonel William R. Plum, dated at Cincinnati, Ohio, June 5, 1878, he gives the following account of his career as a military operator:

"In 1861 I was sent to St. Louis as chief operator and had there the only Government cipher then known, the old five column one that we had used in the West Virginia campaign for General McClellan. After the removal of General Fremont I was sent to Springfield, Mo., from St. Louis, with despatches in cipher for Major General David Hunter. Fremont had been directed to turn his command over to the next in rank, and the despatches which I bore were instructions from McClellan to Hunter, instructing him to retreat to Sedalia. These despatches delivered I returned with the army to Sedalia, pleased with the journey in the companionship of Charles G. Halpin ("Miles O'Reilly"), Hunter's Adjutant General.

"When General Halleck took command of the Department of the Missouri with headquarters at St. Louis he did not like the arrangement of an operator at the telegraph office being the sieve through which the cipher despatches were filtered, and succeeded in having me detailed for duty at his headquarters.

"At this time there was and had been for some time previous, possibly during Fremont's command, a military telegraph office near Halleck's headquarters under the management of George H. Smith.

"My duties at Halleck's headquarters were very light, the principal trouble being to kill time. I remained here until after the battle of Shiloh and when Halleck and staff took the field I went with them. In the field Halleck took command of the joint armies of Grant and Buell and proceeded to march from Pittsburg Landing to Corinth, occupying thirty days in traversing the thirty miles. My duties continued of the same heavy character, translating one or two cipher messages a day, doing duty as staff officer to the then Inspector General, General Judah, occasionally again assisting General Cullum, the chief of staff, in the preparation of some military work. After reaching Corinth I remained with the staff. My last duty was to translate a short laconic despatch from President Lincoln to Halleck calling him to Washington as General-in-Chief. Halleck ordered me to accompany him. I did, as far as St. Louis and Cincinnati, and there severed my connection with the Government. General Cullum had offered me a choice of commissions, as a Lieutenant in the Regular Army, or a Major in the Volunteer service, in either case to be detailed for duty to Halleck's staff. I chose the Volunteer commission, but before it came I had divested myself of the brass and blue and resumed my duties as brass pounder, which were shortly afterward surrendered to enter the express service.

"I saw no battles, only a skirmish or two, saw only the good side of army life, the good meals of a headquarters staff mess, the sufficiency of blankets and good camp equipage, the fellowship of bright men and the friendship of many.

"The acquaintances formed were of value to me. Of good solid hard work I do not think I had one good day, unless I except a horseback ride, and my first one, too, from Tipton, Mo., to Springfield, Mo., on a horse and saddle furnished by Phil Sheridan, then Captain and Assistant Quartermaster at that point. I do not speak of it, you will notice, as to Springfield and return, for I returned in an ambulance.

"I felt then as if I had passed through two hundred battles, had been wounded two thousand times and that all of my wounds were in one spot.

"There does not occur to me a single incident in my brief and inglorious military career that would serve to even give a single point of historical interest."

The Hudson Word Counter Again on the Market.

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 of this useful article 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.

A patent No. 919,115, for an antenna for wireless telegraph systems, has been issued to C. D. Babcock, of New York. For use on shipboard. By locating the horizontal portion in a vertical plane there is less swinging than if the spreaders were horizontal.

Important Subjects Treated in Back Numbers.

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

British System of Timing Messages ..... Dec. 1, 1902
Buckingham Long Distance Page Printing Telegraph.... Sept. 1, 1902
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C. K. Jones' Automatic Telegraph Circuit Protector and Signaling Machine ..... June 16, 1903
Collins Overland Telegraph ..... May 16, 1903
Crehore-Squire Automatic Telegraph System..... May 16, 1903
Definitions of Electrical Terms, Mch. 16, Apl. 1-16, June 1, July 1-16, 1904
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Engraving of Clarence H. Mackay ..... Nov. 16, 1903
Engraving of Col. Robert C. Clowry ..... Apl. 16, 1903
Engraving of the Late John W. Mackay ..... Aug. 1, 1903
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K. R. Law as Applied to Quadruplex Circuits..... Jan. 1, 1904
Postal Telegraph-Cable Company, History of (with portraits of officials) ..... Feb. 1, 1904
Postal Telegraph-Cable Company Rules Governing Construction and Repair of Telegraph Lines, Apl. 1-16, May 1-16, 1904
Printing Telegraph Systems, Story of ..... Jan. 1, 1903
Progress of Telegraphy During Last Thirty Years, W. Mayer, Jr. ..... Mch. 16, 1904
Protection of Telegraph or Telephone Lines When in Hazardous Proximity to High Speed Lines ..... June 1, 1904
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What Constitutes a First-Class R. R. Operator..... Dec. 16, 1904

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Anniversary Number, Twenty-fifth Year, Containing Full-Page Engraving of Officials and History of Various Telegraph Companies.... Jan. 1, 1908
Barclay Ptg. Telegraph System (serial) June 16, 1908, to March 1, 1909.
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Telephony for Railways.—W. E. Harkness.. July 1-16, 1908
Train Despatching by Telephone..... May 16, ... June 16, July 1, Sept. 16, Nov. 1, 1908
Wire Chief, How to Become a.. Jan. 16, Feb. 1 and 16, 1908

By taking a little trouble, when Telegraph Age first comes to hand, it may be preserved to form a permanent and valuable addition to the reading matter of a kind which all telegraphers should be supplied. We furnish a neat and attractive cloth board binder, which will be sent by mail, prepaid, for $1. It has good, strong covers, on which the name Telegraph Age is stamped in gold, and means by which each issue may be securely held as in a bound book. One binder may thus be made serviceable for a number of years, and when successive volumes, as they are completed, are bound in permanent form, the subscriber ultimately finds himself, for a moderate cost, in possession of a most valuable addition to his library, embracing a wide variety of telegraph, electrical and general information.

The publisher of Telegraph Age urges upon subscribers to this journal the desirability of having the paper sent to their home address rather than to their place of business. The reason is obvious. If it goes to your home it reaches you without danger of obstruction or abstraction by your office associates who are sometimes prone to borrow your copy to your discomfiture and their edification, but at your expense. This naturally is a source of irritation and of course you don't like it. If a man wants Telegraph Age he should pay for it, and the individual who is paying for his copy should be guaranteed in his rights.

As we regard our subscribers as our friends, and believe we are supplying them with a telegraph paper the like of which does not elsewhere exist, we dislike to see them disappointed, and wish to protect them in their prerogative so far as we are able. We believe that a good many disappointments of non-receipt of the paper might be averted if our suggestion of sending it in all cases to the homes of its subscribers were adopted. Changes of address will be made as often as desired.

Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Hotel Pontchartrain, Detroit, Mich., June 23, 24, 25, 1909.

Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Young's Hotel, Atlantic City, Sept. 14, 15, 16, 1909.

Old Time Telegraphers' and Historical Association, will meet at Fort Pitt Hotel, Pittsburg, Pa., Aug. 17, 18, 19.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.

Train Despatchers Association meets in 1909 at Columbus, O., June 15, 16, 17, Great Southern Hotel.

The stockholders of the Western Union Telegraph Company meet the second Wednesday in October, at New York; election of officers occurs on the third Wednesday in October.

Telegraph Age.

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

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

TERMS OF SUBSCRIPTION.

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

ADDRESS ALL COMMUNICATIONS TO
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253 BROADWAY, NEW YORK.

W. N. GATES, SPECIAL ADV. AGT., GARFIELD BLDG CLEVELAND O.

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MAY 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.

Overhead Construction.

At the recent Philadelphia meeting of railroad, telegraph and telephone officials, representing Eastern corporations, to discuss the subject of storms and adopt means to lessen their effects in the future, many valuable suggestions were made. It seemed to be the unanimous opinion of the experts in line construction work who were present that the shorter the poles the more substantial will be the lines. It was quite evident that in the future high poles will be avoided wherever possible. It was shown conclusively, too, that the use of poles thirty-five feet in length where poles twenty-five and thirty feet in length would answer the purpose, is a great mistake. Some construction departments work on the theory that if a pole is five or ten feet longer than necessary, after it has stood for ten or fifteen years, it can be shortened and reset. The argument which this question brought out, however, proved that the life of such poles after resetting was very short at the most, and in reality it did not pay to weaken the initial line for the purpose of providing for future use poles that had already done service for at least ten years. As one of the representatives said, this is make-shift construction at the best.

Aerial cables and large iron wires on pole lines resulted in added strength to the construction. In some cases it was shown that where two number four gauge iron wires or aerial cables had been attached to the pole line, these lines suffered much less from the ravages of storms than other lines not similarly provided.

The subject of underground long-distance wires received some consideration, but it was evident that none of the engineers present was prepared to recommend an underground system that could take the place of or act as an auxiliary to the present overhead wires. On another page will be found an interesting account of the discussion on construction work and the conclusions arrived at by those composing the gathering.

The Alabama Outlaw Act Declared Obnoxious.

Judge Thomas G. Jones of the United States Court for the northern and middle districts of Alabama, in a recent decision declared the "outlaw act" of the last legislature of that state obnoxious to both the state and the federal constitution. He has, therefore, enjoined Frank N. Julian, secretary of state, from cancelling the license of the Western Union Telegraph Company, which company, being foreign, transferred cases from the state to the federal court, a thing the state laws say is of sufficient cause to cancel the right to do business in the state.

The opinion holds that the act is bad in that it destroys the right of a company, constitutionally legalized, to avail itself of another constitutional right, that of going into such courts as it sees fit, like any citizen. In other words, it is the forfeiture of one constitutional right because of an attempt to use another constitutional right. This is impossible, the court holds, under constitutional institutions, the legislature, under its police powers, having no right to declare harmful the exercise of rights which the constitution secures to citizens.

It is unequal under the rights of the state organic law, in that it punishes a foreign corporation for what a domestic corporation may do, thereby creating a favorite class, which cannot be allowed under the laws.

Absurd State Laws Multiply.

One feature of the proposed Illinois state law against gambling in "futures" in breadstuffs is that telegraph and telephone companies are made liable to a fine of not less than $1,000 or more than $10,000 for transmitting messages to aid in the sales prohibited in the proposed law. The agents of telegraph companies are expected to question each customer who hands in a message written in cipher the meaning of the words, and if a proper explanation is not made the company is directed to refuse to transmit the message.

World's Exposition in Boston in 1920.

The Boston Herald has taken the initiative in proposing that the three hundredth anniversary of the landing of the Pilgrims and the founding of New England should be celebrated by a world's exposition to be held in Boston in 1920. It seems to us especially fitting that such an exposition should be held in Boston, as this city, the metropolis of New England, has been the scene of many important achievements in the development of the telegraph, electrical and allied industries in this country, and, as the Herald states, no international exposition has ever been held in New England. In going over the list of names of men prominent in the records of electrical advancement, we find many who were either born in New England or spent a large part of their lives within its borders.

Professor Samuel F. B. Morse, the inventor of the telegraph, was born in 1791 in Charlestown, one of its suburbs, and Boston may thus lay claim to being the birthplace of the telegraph. It was through the personal efforts of Congressman F. O. J. Smith, of the Portland, Me., district, that Congress was induced to appropriate $30,000 in 1843, to build the first telegraph line in the world, which connected Washington and Baltimore. Although a native of Ithaca, N. Y., Ezra Cornell was engaged at Portland by Congressman Smith to superintend the construction of this line and a large part of the fortune of Mr. Cornell, which he afterward made in the telegraph business, went to found Cornell University.

Joseph B. Stearns, a native of Maine, who took out the first patents for the use of reversed currents and invented the first duplex system of telegraphy, spent all of his active life in Boston. It was between Boston and New York that the first duplex telegraph set was installed over which it was successfully demonstrated that messages could be sent on a single wire in both directions at the same time.

The first electric fire alarm system established in the United States, and in fact, in the world, was installed in Boston in 1852 by Moses G. Farmer and Dr. William F. Channing, and this system contained all of the essential principles of the fire alarm telegraph apparatus as it exists to-day. It was three years after this before other cities began to realize the importance of a fire alarm system and Philadelphia ordered an equipment from Messrs. Farmer and Channing.

The great electrical wizard of the present day, Thomas A. Edison, first attracted the attention of the scientific world in 1868, while a resident of Boston, and an employe of the Western Union Telegraph Company at that place. It was while in Boston that he applied for his first patents on stock tickers and quadruplex telegraph working.

The New England coast, particularly that of Massachusetts, is noted as the landing place of many transatlantic cables. Cable stations are found at Duxbury, Orleans (Cape Cod), Rockport and the nearby town of Rye Beach, N. H. It is interesting to record in this connection that Cyrus W. Field through whose zeal and untiring efforts the first Atlantic cable was laid was a native and life-long resident of Stockbridge, Mass. Stephen D. Field, the inventor and a nephew of Cyrus W. Field, occupies the old family mansion at Stockbridge at the present time and built at that place the first electric street railway car ever constructed in this country.

The first experiments with the telephone were carried on in the shop of Mr. Charles Williams, Jr., in Boston, by Professor Alexander Graham Bell, who was then a resident of Salem, the first articulate speech transmitted over an actual line was between Boston and Cambridge, and the first long distance conversation was between Boston and New York. The telephone was first used commercially in New England, and Boston is the business center from which was developed the great telephone system of the American Telephone and Telegraph Company, which alone to-day comprises over 4,000,000 stations and has a valuation of over half a billion dollars.

These are but a few of the names of sons of Boston and New England who have made themselves famous by their achievements and have aided in the great progress of the electrical industries during the past half century, and Telegraph Age unites with the Herald in the belief that New England should celebrate the tercentenary of its founding in a fitting and impressive manner.

The "Mutual District Telegraph and Messenger Company," was incorporated April 20, under the laws of New Jersey, to construct, own, maintain and operate a line of telegraph or telegraphic and telephone communication, messenger and signal lines, etc., and to extend and operate telegraph, signal, burglar and fire alarm and telephone wires, circuits, etc. The capital is $100,000, and the incorporators are: Joseph A. McClary, George W. Blanchard, Henry W. Pope, William B. Moorewood, H. Lewis Benedict, and Edward K. Summerwell.

Exhibition of Telegraph Offices.

Mr. Jesse Hargrave, superintendent of the Postal Telegraph-Cable Company at Birmingham, Ala., in a letter received some time ago commenting favorably upon the published account of the new Birmingham Postal Office, which appeared in Telegraph Age of April 1, stated that the manager of the office, T. D. Jackson, had set apart an occasional day when the public would be invited to visit the operating room to examine the up-to-date telegraph equipment. Mr. Jackson evidently does not intend to hide his modern plant under a bushel. Nothing to our mind would make a better impression upon the business public than to ask that the facilities of the company for the prompt handling of telegrams be looked over by those interested. The business man too often is brought in contact with an unclean branch office staff, and his opinions of the

company formed under such conditions lead him to believe that all offices are alike, dingy, unclean, and anything but presentable. There are many main offices in all sections of the country that are models of neatness, and the pride of those in charge of them, which ought to be opened for inspection to visitors on certain days. A telegraph exhibition, so to speak, would prove a splendid advertisement. It would teach the business man that a telegraph company is a permanent institution with a well organized staff of competent employes, and not, as many suppose, a stock gambling make-shift to be sold out to the highest bidder at a moment's notice.

The scenes incident to the handling of traffic in the average main office would so favorably impress the customer that he would not only carry away with him well-formed ideas of the company's greatness, but would be very likely to talk to friends of the splendid telegraph industry with which he had just become familiar. What sight is more inspiring than that of a well-managed operating room with its hundreds of wires stretching to all points of the compass? Telegraph companies which have model main offices ought not to hesitate to throw them open for public inspection and thus in a measure reveal the great work accomplished by the telegraph.

Book Review.

"The Design and Construction of Induction Coils," by A. Frederick Collins (Munn and Co., New York, 272 pages), is an exhaustive and well-arranged treatise on this subject. In the twenty chapters of the book the author tells of the history of the development of the induction coil; the theory of the induction coil; method of forming the soft iron core; process of winding the coils; insulation between the primary and secondary coils; vacuum drying and impregnating apparatus; construction of the interrupter; building up of the condenser and making the adjustable mica condenser; reversing switches, commutators, spark gap terminals, woodwork for coils, wiring diagrams and method of assembling; cost and purchase of materials and useful tables, formulas and symbols.

The book contains one hundred and sixty illustrations and over a hundred tables giving valuable information in connection with the design of induction coils. For the amateur experimenter in wireless telegraphy this book should be of great value, as it gives the complete history of an induction coil from the first calculations to the actual operation. The author has attempted, with great success, to describe, in language easily comprehensible to any person who might be interested, every detail connected with the building and operation of an induction coil. The price of this interesting and valuable book is $3.00, and copies may be obtained by addressing J. B. Taltavall, Telegraph Age, 253 Broadway, N. Y.

Robert J. Marrin, President of the New York Telegraphers' Aid Society.

Mr. Robert J. Marrin, the newly-elected president of the Telegraphers' Aid Society of New York, is a well-known member of the profession, he having served almost his entire telegraph career of over thirty years in this city. He has always taken an active interest in the affairs of the Aid Society, and his election to the highest executive position within the gift of its members is, after all, but proper recognition of service faithfully rendered. Mr. Marrin was born in Brooklyn in 1858, and first entered the telegraph service at Greenwich, Conn., in 1878. After about four months spent at this place he entered the employ of the Long Island Railroad and later became manager of the Continental Telegraph Company at Fulton Market, New York. In 1880, Mr. Marrin entered the service of the Western Union Telegraph Company at New York, and remained with them until 1883, when he left their service

ROBERT J. MARRIN.
President of the New York Telegraphers' Aid Society.

and entered that of the Baltimore and Ohio Telegraph Company at the Produce Exchange office, New York. After two years at this place and with a New York broker he returned to Western Union employ and remained with that company until 1891, when after a short time spent with the New York Stock Quotation Company he accepted a position as operator and clerk with H. L. Horton and Company, bankers and brokers. As a reward for his long and faithful service with this firm he has recently been appointed manager of their entire telegraph department.

The Chefoo-Canton cable and the telegraph wires came into the possession of the Japanese Government recently as a result of a decision which had been pending since Manchuria came under their control. Japan had, at the close of 1908, 3,308 telegraph offices, or a total length of telegraph lines of 5,387 miles, a total length of wires of 92,227 miles; telegrams handled during 1908, domestic, 7,544,400; foreign, 363,260.

The Telephone for Train Despatching.*

BY W. E. HARKNESS, OF NEW YORK.

(Concluded from page 320, May 1 issue.)

Some roads have used a set between the transmitter arm and the desk stand, or what is commonly called a "flexiphone." This consists of a desk-stand stem attached to an arm which can be raised or lowered so that it can be used while seated or standing, and in addition can be rotated in a horizontal plane.

"FLEXIPHONE" ARM.

This set possesses the advantages of the other arms and is free from the troubles experienced with the desk stands. The fact that it can be used when standing is an advantage possessed by none of the other arms.

DESPATCHER'S TELEPHONE SET, WITH CORD AND PLUG.

The despatcher's equipment is practically the same on all of the railroads, and consists of a chest transmitter, supported by a band passing around the despatcher's neck, and a head telephone.

This apparatus is connected to the circuit by means of a flexible cord terminating in a plug, which, when inserted in a jack attached to the desk, completes the line connection as well as the transmitter circuit. This arrangement permits the despatcher to move about and to have the use of both hands.

A transmitter key is provided so that the despatcher may listen in on the line without wasting the transmitter battery or bringing noise from the room on the line.

This key differs from those used at the way stations in that it is not necessary for him to hold it down when talking, it being arranged to lock when operated and remain so until released.

On account of this equipment being different from that with which they are familiar, the despatchers in some cases have said that they did not like it. This feeling, however, is not lasting and after a short time disappears. The same feeling existed among the telephone operators in exchanges when similar apparatus was first introduced, but after using it for a short time they preferred it to that which they had been using.

LOUD SPEAKING RECEIVER.

It has been suggested that a loud speaking receiver be used by the despatcher. This arrangement, while available and capable of giving a large

*Paper read before the St. Louis Railway Club, February 12, 1909.

volume of sound, is not satisfactory, on account of the quality of the sound rendered being less distinct than that obtained from a regular receiver held close to the ear. This is largely due to the reflection of the sound waves in the horn which must be used to amplify the sound. Another objection to this device is that noise in the room or from outside will prevent the despatcher hearing distinctly.

A device of this kind is to be tried on one of the eastern roads for use in block towers in connection with the reporting of trains from tower to tower. Another design is being prepared for one of the western roads for trial on a despatching circuit.

The use of a double head telephone has been considered and should be of benefit where the despatchers or operators are located in noisy locations.

DOUBLE HEAD RECEIVER.

The use of a transmitter which could be mounted on the despatcher's desk and which could be spoken to in place of having to speak directly into the mouth-piece, as at present, has also been suggested. This arrangement, while possible, would be found unsatisfactory for two reasons: First, it would render a poor quality of transmission, and second, it would necessarily have to be very sensitive to transmit the voice from a distance and it would therefore pick up other sounds in the room, which, when transmitted on the circuit, would affect the service.

It is possible that under some conditions such devices may render satisfactory service, but it is believed that much better service can be obtained by following standard practices which have proven satisfactory.

The cost of the telephone apparatus depends largely upon the type used and will vary from $17 to $36 per station. An average of $25 per station may be used for rough estimates.

The selective apparatus in general use may be divided into two general classes based upon the method of operation: 1. Electro-mechanical. 2. Mechanical.

I shall not attempt at this time to give a technical description of the selective apparatus, but leave you to examine the two types on exhibition which illustrate the latest development of the two types mentioned.

The Gill selector representing the electro-mechanical type and the Wray-Cummings the mechanical type.

In general the apparatus consists of a selector located at the station, the operation of which is controlled by the despatcher. The selector when operated closes a bell circuit and causes the bell at the station to ring until stopped by the operator answering the call. The operation of the selector is effected by the despatcher sending a combination of impulses of current out over the line, the time between the impulses or the combination of the impulses operating the selector at the particular station desired.

GILL STANDARD SENDING KEY CABINET—CLOSED.

The sending of these impulses at the proper intervals or in the proper combinations is done automatically by the despatcher operating the station and starting keys on his calling mechanism.

Various methods of operation have been suggested and tried. The first method, and one which is still used, is to call each station consecutively. This arrangement required eight seconds to call any one station, or in case a number of

GILL WAY STATION SELECTOR—OPEN.

stations were called it would require eight seconds times the number of stations, to call all stations desired. For example, three stations would require a total of twenty-four seconds or five stations a total of forty seconds.

While the above time was much less than the time taken to call by telegraph, higher speed of calling was demanded and arrangements were made to enable individual stations to be called in from two to thirty seconds, or all stations up to twenty-eight could be called in thirty seconds. A still further improvement enables all of fifty

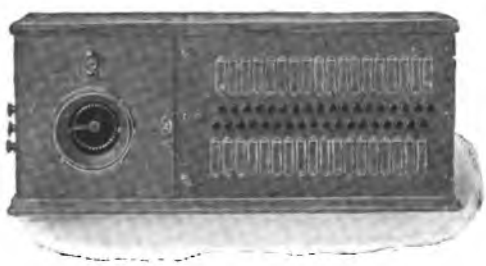
stations to be called in a total of fifty seconds, or individual stations of the fifty in from two to twenty seconds.

Some objection has been raised to the bell at the station ringing continuously until the call is answered by the operator, for in some cases a station might be called by mistake and the call not answered for hours owing to the absence of the operator. This would cause a waste of battery and increase the maintenance expense.

GILL HIGH SPEED SENDING KEY—CLOSED.

Several schemes have been proposed to accomplish the desired results and apparatus is now available for this purpose. One arrangement permits the despatcher to stop the ringing of the bell at any time after it has started. Another arrangement permits the bell to ring for a certain length of time and then automatically causes it to cease.

It is believed that the continuous ringing bell will insure quicker answering of the calls than where the bell rings for a short interval and then ceases. This is based on the experience with the present continuous ringing systems and also upon a similar arrangement in telephone exchange practice in connection with the ringing of subscriber bells by machine until the call is answered.



WRAY-CUMMINGS MASTER SENDING SELECTOR—CLOSED.

One of the selective systems has one feature which is not supplied by any of the others, and that is what is known as an "answer-back" signal. This consists of an audible signal received by the despatcher when he has called a station and the bell has started to ring. This has several advantages.

First: The despatcher is assured that he has called the station and the bell is actually ringing.

Second: The fact that the despatcher is aware of this causes the operators to answer the call more promptly.

Third: It acts as a check on the operation of the station apparatus, as the "answer back" will always be received if the bell is operated.

The selective apparatus at the station consists of the selector, two relays, resistances and a few dry cells for the operation of the selector and bell.

A recent design of selector dispenses with the two relays, as the selector itself may be connected directly in the line in place of being operated by one of the relays. This reduces the amount of apparatus at the station, which is desirable from a maintenance standpoint.

The selective apparatus is operated by relays connected to the telephone circuit.

WRAY-CUMMINGS WAY STATION SELECTOR—OPEN.

Two methods of connecting these relays in circuit are employed: 1. By bridging them across the telephone line. 2. By connecting them in series with the telephone line.

There are advantages and disadvantages with both arrangements.

With bridged relays the impedance must be high enough to prevent excessive losses in transmission due to the large number of relays bridged across the line.

The resistance in the relay bridge must vary at each station to furnish each relay with the proper amount of current to insure its satisfactory operation.

When the relays are connected in series with the line they must be of low impedance to prevent excessive losses in telephonic transmission. This is usually accomplished by shunting the relays with a non-inductive resistance.

It is customary to connect one-half of the relays in series with one line wire and the other half in series with the other line wire, thus balancing the circuit.

It has been found, however, that an exact balance in the number of relays is not necessary.

The disadvantage experienced with the bridged circuit is that in case one side of the circuit opens it is impossible to call a station beyond the break.

With the series circuit it is possible to call every other station beyond the break.

It may be well to state that with one wire open conversation can be carried on by telephone beyond the break.

The transmission losses are less with the bridged circuit, but the losses due to the use of series relays are comparatively slight and in no case have they affected the service to a noticeable extent.

Several schemes have been used to facilitate the patching of the despatcher's circuits.

On account of their cheapness small knife switches have been used in many cases, and special telephone test panels, which are more expensive, have also been designed.

With either of these arrangements patches can be effected very quickly even by inexperienced people.

The test panels offer more facilities for testing than the combination of switches and are less liable to trouble than the exposed switches.

The cost of the total station equipment, including telephones, selectors, test panels and installation, will vary according to the apparatus used from $60 to $96 per station.

An average installation would approximate $80 per station.

Combining these figures with those covering the cost of the despatcher's equipment and the line construction a despatching circuit of 150 miles, to which is connected thirty stations, will cost approximately $15,000, or at the rate of $100 per mile.

This figure is not excessive when the advantages which may be derived from such an equipment are considered, and it will be found that the expense of construction and maintenance will be insignificant as compared with the amount saved by the prompt reporting of delays, the relieving of congestion of traffic and the reduction in the loss of time.

Railway Telegraph Operators' Legislation.

Congressman Thomas W. Hardwick of Georgia has introduced a bill in the House of Representatives, brief mention of which was made in our previous issue, to provide for the use of the block system for all trains engaged in interstate commerce; to provide for the examination and license of all telegraph operators engaged in handling block signals and telegraphic orders affecting the movement of trains on such railroads, and to provide for the hours of labor to be required of such telegraph operators and their compensation. The bill reads as follows:

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that within six months of the approval of this act every railroad in the United States engaged in interstate commerce shall be required and compelled to adopt what is commonly and generally known as the telegraphic block system, in the operation of all its trains, and that the size of all blocks and the location of all block lines shall be subject to the control of the Interstate Commerce Commission.

"Section 2. That no person shall be employed as a telegraph operator for the purpose of sending, receiving, or in any way handling telegraphic train orders to govern and control the operation of any train on any railroad engaged in interstate commerce until such person shall have satisfactorily passed an examination, to be prescribed by the Interstate Commerce Commission, to determine the mental, moral, and technical fitness of such person for such work, and shall have been duly licensed by such commission as a suitable and competent person for the performance of such duties.

"Section 3. That it shall be the duty of the Interstate Commerce Commission to prescribe reasonable hours of labor for all telegraph operators engaged in the business prescribed in the preceding section hereto, and to prescribe the limits of compensation to be paid to such operators, and the said Interstate Commerce Commission shall have the right and power to prescribe all necessary qualifications, regulations, requirements, and rules to carry out all the provisions of this act.

"Section 4. That any railroad company violating any of the provisions of this act, or of the rules of the Interstate Commerce Commission in pursuance thereof, shall be punished by a fine of not more than five thousand dollars, and any person who, as executive, official, manager, or superintendent of any railroad subject to the provisions of this act, shall violate, disobey, or disregard any of the provisions of this act, or of the rules of the Interstate Commerce Commission in pursuance thereof, shall be punished by a fine of not more than one thousand dollars or by imprisonment for not more than one year, or by both, in the discretion of the court.

Mr. George L. Lang, formerly superintendent of telegraph of the Queen and Crescent Route, now retired from active business service and residing at Chattanooga, Tenn., in a recent letter renewing his subscription, says:

"While I am entirely out of the service, I want to keep in touch with the old boys and know of no better way than to continue my subscription to Telegraph Age."

Chauncey M. Depew's Retrospect.

Chauncey M. Depew, on his 75th birthday, which occurred on April 26, in taking a retrospective glance at events which have taken place during his life time, had this to say concerning the telegraph and telephone:

"I remember when the news came by mail to the New York papers in 1844 that Morse had sent a telegraphic message by wire from Baltimore to Washington, and the New York papers arrived that evening at our village forty miles up the Hudson, that I stood behind the wise men of the town gathered in the drug store excitedly discussing the Whig National Convention at Baltimore, and the alleged telegraphic dispatch. It was their unanimous conclusion that no such hoax as this reported message by wire had ever been attempted upon the American people since the announcement by Miller of the end of the world on a certain day which led thousands to dispose of their goods and had carried hundreds of thousands into the woods.

"And yet we see to-day the invention of Morse uniting every part of our country with instantaneous communication and cables across the ocean belting the globe and doing more than all other agencies to distribute and unify civilization and culture and uplift and unite the human family. Gardiner Hubbard, as government inspector of the Railway Mail Service, while in my office said that his son-in-law, Professor Bell, had invented a talking telegraph. There was great scepticism as to its utility. He wanted money for its promotion and offered me for ten thousand dollars a one-sixth interest in the Bell telephone. My friend, William Orton, president of the Western Union Telegraph Company at that time, and an acknowledged authority on such matters, persuaded me from accepting the offer on the ground that the whole scheme was a failure.

"That investment with accumulated dividends would to-day have amounted to about a hundred millions of dollars. What a lucky escape. I would have been dead years ago from high living and my family ruined by too much prosperity. But the telephone has become such a necessity of modern living that it would be impossible for us to get along without it."

Preserving Telegraph Poles in Europe.

Various methods of applying preservatives to telegraph poles have been in practical use in Europe for more than 30 years, says Consul-General Robert P. Skinner, of Hamburg. Considering the simplicity of the processes and the positive results achieved, it is little less than amazing that no general attention has been paid to the subject in the United States. It would be difficult to find in any advanced European state a single telegraph or telephone line, the poles of which have not been impregnated with an antiseptic composition. Figures are published relating to twenty German telegraph lines the impregnated poles of which were set at various intervals from 1877 to 1893. Of those set in 1877, thirty and thirty-eight per cent. were still sound and in use after twenty-six years service, and of those set from 1891 to 1893 there are records of five lines upon which one hundred per cent. of the poles are still standing. The Bavarian postal service, after thirty years experience, certifies that the known average life of impregnated poles in Bavaria is seventeen and one-half years, and the German imperial administration calculated in 1903 that the known average life of such poles was sixteen years. In the meantime the work of impregnation is being more perfectly performed, so that future statistics will show much better results.

The results of impregnation are so conclusive and undisputed that it would be futile to present further details on the subject. In recent years the most usual preservative agents in use have been chloride of zinc, creosote, and bichloride of mercury, applied by imbibition, or by impregnation by injection forced by the pressure of the air. This second method of treatment generally consists in placing the wood in closed metallic recipients from which the air is pumped, and the liquid then introduced under high pressure.

Until comparatively recently, it was very common to treat wood by injection under pressure with chloride of zinc diluted with water. While this antiseptic is efficacious, it loses its qualities and becomes hygroscopic. To overcome these disadvantages creosote was added to the mixture, and under the title of "mixed impregnation" this system has been adopted.

The use of creosote alone is quite unusual in the treatment of telegraph and telephone poles, because of the odor, tendency to melt and run under the sun, and objections raised by linemen. It is common, therefore, to use bichloride of mercury, (the French Government uses sulphate of copper), the efficacy of which has been known since the middle ages, when it was used to combat decay and the action of insects. At the Himmelsbach plant, near Freiburg, Baden, this is used in sixty-six per cent. solution. The wood is plunged into timber or cement recipients and there remains from ten to fifteen days. In this plant, moreover, treated poles are given a special coating of some unknown antiseptic, which extends about two feet above and two feet below the point where the pole enters the soil. This application protects the part where the variations in humidity commonly attack the pole. In the Himmelsbach establishment the baths for treating telegraph poles are ninety-eight feet in length.

A Minneapolis wholesale house received the following telegram from one of its traveling salesmen in South Dakota:

"Snowing hard. Snow plows stalled. Good here for week. Wire funds and instructions."

The following reply was immediately returned:

"Telegram received. Hundred telegraphed you. Lose no time. Play poker, remit winnings to house." —Harper's Weekly.

Storms and Line Construction.

Some very interesting statements were made at the recent meeting in Philadelphia called by the Pennsylvania Railroad Company, as briefly mentioned in our May 1 issue, to discuss the damage done by recent storms and means of preventing similar trouble in the future. The telegraph, telephone and railroad interests in the East were represented by those having charge of the construction work and from this standpoint alone it was a gathering of unusual importance.

Mr. J. B. Fisher, superintendent of telegraph of the Pennsylvania Railroad Company, after nominating as the presiding officer of the gathering, Mr. P. L. Spalding, general manager of the Bell Telephone Company of Pennsylvania, stated the object of the meeting. After the damage suffered by the various interests represented had been recounted, Chairman Spalding called for opinions as to the best method of construction to avoid similar casualties in the future.

In starting the discussion, Mr. Fisher said:

"My thoughts on the subject are more or less indefinite. From our own experience, it had occurred to me that there were two things to be considered. The first thing is to build a strong pole line and have it well guyed and so constructed as to be able to withstand the storm effects. In suggesting that, I have not lost sight of the mechanical difficulties of placing a heavy load up in the air with all the weight at the wrong end—an inverted cone—and then the stress of the high winds added. It has occurred to me whether, under the conditions which have existed at times too frequent to be comfortable, we can build a pole line that will stand up. My thought is that we should have a pole line of about sixty or seventy poles to the mile, storm-guyed every half-mile, and with frequent head guys. Our specifications call for a 35-foot pole to have a top twenty-five inches in circumference, and to be imbedded in the ground five feet; storm guys every half-mile. We say very little about head guys; side guys to be used at curves. Now, the indefinite part of my thought is, whether under the conditions which existed March 4, any pole line would stand up. I thought if we could make a line to carry four 8-pin arms or three 10-pin arms, with 35-foot poles, twenty-five inches at the top, imbedded five feet in the ground, storm-guyed every half-mile, and side-guyed on curves, sixty poles to the mile, we would have a line that would withstand pretty serious storms."

Charles Selden, of Baltimore, superintendent of telegraph of the Baltimore and Ohio Railroad, in expressing his ideas on the subject, said:

"It seems to me that the pole line situation resolves itself into getting as short a pole as you can to carry the number of wires you wish. For instance, if you should have a 35-foot pole set five feet in the ground with three crossarms on it, that leaves you a line about 25 feet 6 inches from the lowest arm to the ground. Now, my experience with short poles has been that they stand the storms remarkably well, even when old; and I am of the opinion that the shorter you can get the pole, that is, to meet the clearance required and the conditions, the safer you are.

"If we should increase the frequency of the poles we would enhance the strength of the line, or, rather, the resisting power of the copper. A short-pole line with frequent poles would cover that question very well. There are many places where you could not have short poles, but there are many places where you could. I noticed on the Santa Fe Railroad that they had two crossarms. I do not know the capacity, but they were using 20-foot poles. It was over the deserts and open plain country, where they would not be disturbed, and I am told that they stand the very severe storms, and that they do not intend to put in higher poles until the number of wires makes it necessary to do so.

"There is another reason why I like the short pole. Very often lines are built, for example, using a 35-foot pole assuming that they can be cut and reset. Therefore, I think in many instances we are carrying about five feet more timber than we need, simply because the poles can be reset. When the time comes to reset them, they will not last as long as on the original setting, and then you find before the reset poles give away that the arms have to be renewed. I am, therefore, in favor of using the short-pole wherever possible, and a new structure, and not have a patched-up affair, because that enters into the maintenance account but the amount does not excite any comment.

"On the Washington branch of what we call the Baltimore and Ohio side we had eleven iron wires and thirteen copper wires that went down. In the city of Baltimore on one route there, a distance of two miles, there were four aerial cables. There were about fourteen poles down. The cables had a tendency to stiffen the line and help the line out.

"On the subject of the 'A' poles, I can see that the strength of such a structure is much better, but I take it that they would need renewals just the same as any other pole, and, therefore, there would be twice the number of poles to renew. There would be twice the amount of cost for one sustaining fixture.

"As to the concrete poles, while I know nothing about them except some conversation I have had on the subject, they are, of course, very expensive, and not only expensive as to first cost, but, I understand, they are expensive to set. If one only had an assured right of way by ownership, it doubtless would be well to consider the concrete pole question, but with the railroads it is different. In the concrete pole situation, it would be necessary to have them where they would not have to be moved very often. The same objection applies as far as iron poles are concerned."

W. F. Taylor, of Altoona, division operator of the Pennsylvania Railroad, in his remarks, said:

"Mr. Selden, I think, is entirely correct when

he says that we should use the shortest pole possible. That is apparent from a mechanical standpoint. It is the practice in the White Mountain and the Rocky Mountain regions to erect very short poles, the bottom arm, in some cases, being not more than six, eight or ten feet above the ground. Mr. Selden is also correct when he says that short poles will stand up under any sort of a storm; but the fact remains that a short-pole line cannot be maintained uniformly through any territory, and the fact also remains that it is not now possible, or rather I should say I do not believe it is possible, to construct any line that will withstand storms under all conditions. As, for instance, a pole line, thirty-five feet high, and a fifty-foot span, carrying eighteen wires, with an inch of ice on the wire and the wind blowing at seventy miles per hour, gives a resistance of twenty-five pounds per square foot. If I were building a line to withstand the storms, I would use the shortest pole that could be used to take care of the number of wires required. I would place the poles from 100 to 125 feet apart and head-guy and side-guy with considerable frequency, at least every half-mile, as suggested by Mr. Fisher; and with such a line I believe we would go through with the severest storms that we are subjected to in some sections of the country. Twelve years ago we erected an experimental line of about one mile of 'A' poles, which do not show any sign of being affected by storms. It certainly is a mechanical structure, and it eliminates to a large degree the difficulties experienced by the inverted cone.

"From the standpoint of a mechanical structure, however, the cost up to the present time, I think, is still prohibitive. We also built a mile of iron poles, using worn-out rails. We put them in the form of the letter 'H,' and close together, not over twelve or fourteen inches apart. These poles cost $10.80 to put in the ground. They have been in service about twelve or fourteen years, and stand it very well. My opinion is that it is entirely possible to erect a satisfactory line of single poles by supplying some features which would tend to strengthen. I have for years been an advocate of placing at least one or, better, two heavy iron wires on all of our poles, put in on the pins next to the pole; that is, iron wire of No. 4 gauge. This would be for telegraphic or telephonic purposes."

C. A. Lane, of New York, superintendent of construction of the Postal Telegraph-Cable Company, said:

"I will say a few words about the experiments we have tried. On the mountains between Blairsville and Altoona, we had a 19-wire line, mostly No. 9 and No. 10 copper, and for nine consecutive winters the line went down. About five years ago we took the copper wire down and strung nineteen No. 6 iron wires, using fifty poles to the mile, with 25-inch top, 40 inches circumference at the base. This has been satisfactory, but would not apply on the railroads, on account of the slope, and the iron line wire would not do.

"We had a wreck between Baltimore and Washington on a 35-foot cedar line carrying twelve wires and forty poles to the mile, and 325 poles were broken, whereas if the poles had been twenty-five feet, we would not have had one-tenth that number of poles broken, I believe.

"I noticed some time ago that the Western Union have a line carrying forty wires, 25-foot poles, with four 10-pin arms, and that strikes me as an ideal line. Of course, where there are trees or obstructions, they have gone up to the necessary clearance. The more you can reduce the leverage, the stronger and safer your guying is. With a 25-foot pole and three crossarms, it would give you about fifteen feet of clearance from the lowest arm to the ground.

"There is no system or plan, I think, to eliminate breakage of copper wire. In the storm of 1902, on our line for a distance of forty-eight miles, we had 300 poles broken, and the wires and crossarms were a total wreck. To meet the conditions of the storms the wires do not have the necessary tensile strength. I think the most sensible thing is, as Mr. Selden suggested, getting the poles as near to the ground as possible. The nearer you get to the earth, the stronger and safer will be the line."

T. L. Ingram, of Atlanta, Ga., general superintendent of the Southern Bell Telephone and Telegraph Company, said:

"I think the proper policy to follow would be to ascertain as well as you could the ultimate needs for wires in the particular route being considered in a given length of time, that time to be the estimated life of the timber used. Then shorten the poles as much as the laws and the traffic or obstructions permit. Where you want to withstand the sleet-storms, and that is what we are here to discuss, you should get as close to the ground as possible, and consider the ultimate requirements of the route and the life of the poles used. That would be the way to work it out economically from a construction and maintenance standpoint. Now I have projected, and will probably build during the coming summer, a ten-wire line ninety miles long on railroad right of way, and we purpose using 16-foot poles, and increasing the height of the pole where the obstructions require it or where we have to cross a highway. We have some other short-pole lines, or lines of short poles, but this will probably be the first one in the Southern Bell Company's territory. This will give us what I am aiming at, and that is, the cheapest in construction, the cheapest in maintenance, the lowest in replacements, and with the greatest possible strength. In 1897 we built a line in Georgia of creosoted pine, and the results have been satisfactory. We have some lines treated with hot carbolineum, treating every alternate pole, leaving the others untreated. We hope to get better results that way than by treating one line and leaving another untreated. We have also tried the upside-down proposition, be-

cause the people insisted that the poles would last twice as long. We set the poles upside down and straight, alternating. We have not had the line up long enough to get any definite results. I do not know the theory of this proposition. The Foresting Department at Washington say there is nothing in it, but are following it because we gave them the data.

"I would like to mention another experiment that may be interesting. We built a cypress line, a local line, in the South, quite hurriedly, and I was struck with the statement of the lineman in charge who said the poles were growing. I don't know whether you can or not, but we are going to spend some money trying to get a line like that; get the cypress in the ground as soon as the timber is cut on account of the pole growing."

H. W. Drake, of New York, of the American Telephone and Telegraph Company, expressed the following opinions:

"I think Mr. Selden has stated the proposition when he says to keep the lines as low as possible. The requirements of the route should be studied as well as the probable life of the poles used. The conditions on some of the lines are rather interesting. The New York-Chicago line, a 40-wire line, west of Altoona, has some interesting construction. The poles for some considerable distance just west of Altoona run about sixty to the mile, and the wire is No. 8 copper. That No. 8 copper is 475 pounds to the mile. The tying is all done by a special method, which was necessary in that section. In that particular section we have very much less trouble than on our other lines. The height of that line averages about thirty feet with four 10-pin arms. We could not come down to a lower line as this is a general highway, and there has to be sufficient clearance over the road."

C. H. Bristol, of New York, general superintendent of construction of the Western Union Telegraph Company, said:

"While there are lessons to be learned from the storm, we have not finished studying them to see where they are applicable, because of the fact that there are no two situations exactly alike, and a general plan of procedure cannot be outlined for every case. It will be some time before the lessons learned will be thoroughly thought out to the advantage of the Western Union.

"We have lines of almost all the descriptions given. The poles to the mile and the guying and so forth must be handled with judgment. It takes a storm like the recent one to bring out the conditions. I do not know of any storm affecting such a small area as this one did that knocked so many poles out of the ground. In regard to the concrete pole, it won't burn, but the weight of it would bring the transportation figures up quite a little, together with the setting of it. I cannot say as to the working of them."

Nathan Hayward, of Philadelphia, chief engineer of the Bell Telephone Company of Pennsylvania, in discussing the situation from his company's standpoint, said:

"It was interesting to note the effect on stub poles which we have been working with under Mr. Stevenson's specifications. We had only one stub pole that went down. We found that the poles that were less than seven years old stood up very well, and that the old poles went down. We have not as yet determined on anything definite as a result of the storm.

"As Mr. Lane brought out, you cannot consider the poles separate from the wire. The strength of the pole itself must be considered. First the pole, and then the wire on the pole. As it was found in the storm at Baltimore, and I understand also in Ohio this winter, a great many of the poles went down simply because the wires broke on one side, bringing an unequal strain on certain poles, one or more poles going down and then the whole line going down. We found in the New Jersey storm this winter that those pole lines on which we had an aerial cable under the crossarm stood up better than the lines on which we did not have any, and as a result of that we tried placing a strand running along the line underneath the lower crossarm. This was done after the first storm and before the second storm on a line that had been badly affected, and it showed good results.

"We have a large amount of aerial cable in Baltimore, and it stood the storm remarkably well. Another interesting case along the same line was our west of Baltimore line, which had on the pole-pins on two of the crossarms very heavy iron wire, and the line, although it was with this exception entirely of copper, was practically intact. I want to join everyone else who has said you want to build the line as near to the earth as you can. There is no question about that."

In reply to a question as to how far his company had gone into the subject of "A" and "H" poles, F. A. Stevenson, of New York, plant superintendent of the American Telephone and Telegraph Company, said:

"As a general line proposition, we have a considerable amount of old construction, 'A' and 'H' fixtures. Single poles with 'A' or 'H' fixtures depend largely on the character of the country. As a general rule, the type of construction is a single-pole line, keeping the poles as low as possible under the existing conditions. We have in the extreme South through the swamp sections some 'H' fixtures, and in some foreign construction you see a fixture used the shape of the letter 'N,' which consists of two upright poles with one pole running from the top of one to the bottom of the other. But the various types of construction other than single pole that have been experimented with are purely a matter of local conditions.

"The question of a manufactured pole is very much unsettled. It is a question whether you can get a manufactured pole of the same strength as the wooden pole, that is, cedar or chestnut, of a good reasonable specification, at anything like the cost of the wooden pole. With your concrete pole

the additional cost enters into the question as well as transportation. You have to consider whether poles can be satisfactorily manufactured on the ground or at some central point.

"In regard to the wire proposition, which is very important in the matter of breaks, I have in mind one case of a break out West where in a section of eighty miles of 20-foot line carrying only six wires, I think, two No. 8 and four No. 12, we had between seven and eight hundred breaks. It was simply a question of the dead weight of the ice and the high winds. That was in the prairie section in Western Kansas. I do not want to give the impression that we do not appreciate the seriousness of the break of March 4, but preceding that about three weeks we had a break which was very much more serious, that is, it covered a greater distance and lasted much longer. The storm began in Denver and ran right through the country to Boston. In Connecticut, the ice on No. 12 wire would weigh about six pounds, and in the northern part of Ohio it weighed about two or two and a half pounds per foot. In some places the ice on the crossarms extended from the one above to the one below.

"I think it would be difficult to outline the best type of construction, as many conditions enter inter into it. You have to consider whether it is an area subject to sleet-storms, wind-storms, etc. In this immediate vicinity, the sleet-storm proposition has to be considered more or less, while in other sections of the country the sleet-storm does not enter into the matter. You also have to consider the value of the line to you—what you can afford to spend for it."

After the close of the discussion, the following resolution was unanimously adopted:

"That, in the construction of a line to carry not to exceed thirty wires, a construction of 25-foot poles be set with a maximum of fifty to the mile; this to be supplemented by extra guying to meet extreme conditions."

The Rowland System in Italy.

Signor Umberto Mondini, the Italian telegraph engineer, in an article in the Review, "Telegrafia e Telefonia," of Milan, for March, 1909, on the Rowland printing telegraph system, says in part:

"We can now safely say that the Rowland printing telegraph system in Italy has passed the shoals of diffidence, opposition and petty personal interests. It would be easy to give a humorous sketch of the embarassment of the old employes at losing their reputation for understanding all the telegraph systems in use, but this is not the place to dwell upon such matters.

"The diffidence I have mentioned has at last given way to the evidence of exceptional occasions which have called for an apparatus of unusual capacity. On the occasion of the Sicilian earthquake the voluminous official and journalistic telegrams, in fact, all the correspondence of Sicily, were transmitted through Rome and Naples over the Rowland circuit. During the first fortnight an average of 4,000 telegrams were transmitted per day, which, if reduced to messages of ordinary length would have been equal to an average of 7,000 telegrams per day. The Rowland apparatus in use uninterruptedly saved the situation, all the parts working perfectly, with but one-half hour's rest during each twenty-four hours.

"It may be said that, theoretically an induction from the Rowland of a few milliamperes does exist, but I shall point to practical experience which I have had on this subject. The Naples-Milan Baudot is not disturbed in the least by the Rowland on a parallel wire between Rome and Naples; neither has any disturbance ever been noted on the Rome-Naples Baudot on a parallel wire; on the Rome-Bari Baudot likewise there is no disturbance caused by the Rowland. The Rowland has been held responsible for the bad working of the Baudot when it has afterwards been found that either the wire or the Baudot apparatus was at fault. Some foremen when they do not know what excuse to find invoke the idea of trouble from the new system.

"Our good Rowland operators transmit seventy and more telegrams per hour without mistakes and without fatigue. This is partly due to the keyboard, which is as easily worked as that of a typewriter and more manageable than that of any other telegraphic keyboard.

"On the Rome-Naples line there are five wires in service, but during the Rowland hours of working on one of these wires the other four are all put into use for stock exchange business and patching circuits. This most valuable margin would not be available but for the presence of the Rowland on this pole line.

"It is safe to say that the circuits from Naples to cities in Northern Italy are interrupted every other day. At such times all the correspondence is sent to Rome and hundreds of extra telegrams at a time are brought to the Rowland installation. All that is needed is to start another unit or two and in a short time the traffic has been cleared up. I think it would be advisable to extend the Rowland system on all our remaining lines where the traffic exceeds the capacity of the present apparatus."

Mr. Nally, on Railroad Contracts.

General Manager Nally, of the Postal Telegraph-Cable Company, upon being shown the extract from the report of the Secretary of the Department of Commerce and Labor, in regard to telegraph contracts with railroads, said:

"While we have had many opportunities to do so, we have not made any such railroad contracts for over two years, nor shall we make any such new contracts or renew existing contracts in future unless we can do so on a basis that will leave us a fair margin of profit. If the Western Union Telegraph Company wishes to continue to make new contracts and renew old ones upon the former ruinous basis, it can do so."

Society of the United States Military Telegraph Corps.

Colonel William Bender Wilson, president of the Society of the United States Military Telegraph Corps has appointed the following reception committee in connection with the twenty-eighth annual reunion of the society which will be held in Pittsburg, August 17, 18 and 19: Theodore E. Moreland, chairman; Joseph W. Boyd and Thomas Armour, Pittsburg; George W. Baxter, Cleveland, Ohio; Daniel Colestock, Titusville, Pa.; J. W. Freeland, Marion, Ohio; Charles W. Jaques, Ashtabula, Ohio; George A. Low, Sr., Wilkinsburg, Pa., and S. B. Rumsey, Oakmount, Pa.

A meeting of this committee will probably be held some time in June for the purpose of arranging plans in connection with the Old Time Telegraphers' and Historical Association, whose re-union will take place at the same time.

A Tribute to Colonel Wilson.

The telegraph people present at the complimentary dinner tendered to William Bender Wilson, the retiring official of the Pennsylvania Railroad Company, after a service of fifty-five years, as referred to in our May 1 issue, were: Richard O'Brien, of Scranton, Pa.; William J. Dealy and David Homer Bates, of New York, and Jesse W. Crouse, of Philadelphia. A handsome gold watch was presented to Colonel Wilson by William A. Patton, a vice-president of the Pennsylvania Railroad Company, in behalf of his associates. Mr. Bates pays the following tribute to Colonel Wilson:

"My knowledge of the many hours' daily work for the Society of the United States Military Telegraph Corps, of which he is president, rendered by Colonel Wilson, had led me to the belief that he had no other tasks to perform, but I found at the dinner that he had all along been doing twice as much or more for his railroad comrades, and in an equally unselfish, devoted and intelligent manner. My admiration for him has been increased and deepened, and it was a revelation and delight to listen to the warm testimonials of reverence, esteem and affection from so many of his old railroad friends."

Among those present at the dinner were two vice-presidents of the company, Charles E. Pugh and William A. Patton, and many general managers, general superintendents, superintendents, secretaries and heads of departments, not only of the Pennsylvania Railroad but of the Baltimore and Ohio, Reading, and other roads.

The Railroad.

The Cleveland, Cincinnati, Chicago & St. Louis Railway, C. S. Rhoads, superintendent of telegraph, has ready to place in operation, a telephone train despatching circuit from Cincinnati to Indianapolis, a distance of 111 miles, 96 of which are double track and 35 single track. This circuit has twenty-nine offices.

WANTED.—Printed copies of the minutes of the Association of Railway Telegraph Superintendents for the years 1896 and 1898, and any years previous to 1893. These numbers are needed to complete files. Address W. J. Camp, Canadian Pacific Railway Company's Telegraph, Montreal, Quebec.

Mr. Joseph Beaumont, whose appointment as superintendent of telegraph of the Panama Railroad was announced in our May 1 issue, has had about twenty years' experience in railway and signal work, having entered the employ of the New York Central in 1891. He enlisted for service in the Spanish-American War in 1898, and was soon promoted to be Lieutenant of the 9th U. S. Volunteer Infantry. He entered the service of the Standard Railway Signal Company in 1900, and in 1906 accepted a position with the General Railway Signal Company. In 1907 he became general supervisor of the Atlantic Coast Line, which position he left in January, 1908, to become signal engineer of the Panama Railroad.

The Telegraphers' Beneficial Association held its twenty-ninth annual meeting a few days ago in the Pennsylvania Railroad building at Trenton, N. J. The election of officers resulted as follows: President, William Ettenger, Elizabeth; vice-president, George A. Cliver, Trenton; secretary and treasurer, William H. Clarke, Elizabeth; trustee, F. T. Abercrombie, superintendent New York division; executive committee, H. T. Vaules, Elizabeth; W. T. Swem, Trenton; George C. Kadel, Camden; Edward P. Bruere, Trenton, and William C. Rogers, Camden; auditing committee, I. A. Van Dusen, Elizabeth; W. H. Buckalew, New Brunswick, and Edward S. Mullen, Frankford, Pa. The members of the association are employes of the telegraph department of the Pennsylvania Railroad Company.

The Illinois Central Railroad Company, G. H. Groce, superintendent of telegraph, is installing telephones for train despatching on the four divisions between Chicago and Cairo and East St. Louis. This installation will be completed within the next two weeks, after which the company will put in service as fast as possible telephone circuits on its Tennessee division, between Paducah, Ky., and Memphis, Tenn.; on its Mississippi division, between Memphis, Tenn., and Canton, Miss., and between Water Valley, Miss., and Grenada; and on its Louisville division, between Louisville, Ky., and Paducah. The wires and instruments are already up on the districts on the Tennessee, Mississippi and Louisville divisions, so that all that remains to be done before adopting telephone despatching there is to instruct the men. When these installations are completed there will be a total of about twenty-five hundred miles of the Illinois Central system equipped with telephonic train despatching apparatus.

The Association of Railway Telegraph Superintendents will meet in annual convention at the Hotel Pontchartrain, Detroit, Mich., on June 23, 24 and 25. The secretary of the association, Mr. P. W. Drew, superintendent of telegraph of the Chicago division of the Minneapolis, St. Paul and Sault Ste. Marie Railway, Chicago, Ill., will be glad to answer any questions regarding the coming convention. Mr. E. H. Millington, of the Michigan Central, Detroit, Mich., is chairman of the committee of arrangements, which is a guarantee that the convention will be a success from every standpoint.

The Grand Trunk Pacific Railway, Telegraph Department.

The telegraph department of the Grand Trunk Pacific Railway, during 1908, erected and completed a pole line carrying two wires from Winnipeg, Manitoba, to Battle River, Alberta, a distance of 675 miles, and from Fort William, Ontario, to Lake Superior Junction, Ontario, a distance of 200 miles.

During 1909 the following work will be undertaken: The erection of one No. 8 galvanized wire, and one 210 lb., hard-drawn copper wire from Winnipeg, Manitoba, to Battle River, Alberta; the erection of a pole line carrying four wires, viz.: One No. 6 galvanized wire, two No. 8 galvanized wires, and one 210-lb., hard-drawn copper wire from Battle River to Edmonton, Alberta, a distance of 118 miles, and from Edmonton to Wolf Creek, Alberta, a distance of 123 miles; the erection of pole lines carrying two wires from Melville, Saskatchewan to Regina, Saskatchewan, a distance of 110 miles, from Melville to Yorkton, Saskatchewan, a distance of 40 miles, from Wainwright, Alberta, to Calgary, Alberta, 175 miles distant, and from the main line to Brandon, Manitoba, a distance of 25 miles; also the erection of a pole line carrying four wires 100 miles eastward from Prince Rupert, British Columbia.

It is expected that construction of the telegraph line on the National Transcontinental Railway (Grand Trunk-Pacific) between Winnipeg, Manitoba, and Lake Superior Junction, Ontario, a distance of 245 miles, will be completed in July, and communication established with the line in operation between Lake Superior Junction and Fort William.

The construction of telegraph lines on the several sections on the National Transcontinental Railway, east of Lake Superior Junction, is now proceeding rapidly, also along the several sections in New Brunswick, and Quebec.

Mr. A. B. Smith, of Montreal, is general manager of telegraphs of this system.

Radio-Telegraphy.

A wireless telegraph station is being erected at Stoneywood; it will be the most northerly station in Scotland.

The Ceylon Government in the estimates for 1910 proposes to include provision for wireless telegraphy between Colombo and Minicoy.

The Radio-Telephone Company of New York, it is stated, has acquired the Stone wireless telegraph and telephone rights, etc. Mr. Lee De Forest is engineer of the company.

Lieut. George C. Sweet will represent the Navy Department at a series of wireless telegraph tests which will be carried on at Brant Rock, Mass., during the next three months.

A patent No. 918,618, for a wireless telegraph receiver, has been granted to W. M. Way, of Austin, Texas. A cup or holder carries a crystalline detector. The cup is rotatable on a vertical axis and an adjustable screw contacts with the crystal.

According to Consular reports from Rangoon, Burma, wireless telegraph stations have been erected at Mergui and Victoria Point in Lower Burma. Victoria Point is the southernmost point in Burma, at the mouth of the Pakchan River, which forms the boundary between Burma and Siam. Mergui is on the coast, 160 miles north of Victoria Point, with direct wire to Rangoon and Calcutta.

Mr. Joseph Pulitzer, proprietor of the New York World, who, on account of continued illness, spends most of his time on his private yacht, keeps in communication with his newspaper by means of wireless telegraphy. He has a first-class telegrapher on board of his vessel and considerable business is exchanged with the land stations each day, during the trips of the yacht up and down the Atlantic coast.

Finding that a wireless telegraph service would be cheaper than a telephone or a cable service, the Isthmian Canal Commission has decided to erect a station at Porto Bello, on the Caribbean Sea, eighteen miles east of Colon, to communicate with the station already established at Colon. It was found that the installation of a telephone line would cost approximately $15,000 and a submarine cable would cost $30,000 while the cost of installing the wireless station including buildings and all equipment will be about $7,000.

The Teishinsho system of wireless telegraphy in Japan, which differs from the Marconi and United Wireless systems, has been improved as a result of the long study of the engineers concerned. Nearly all Japanese steamships on foreign lines are furnished with wireless telegraph equipments. In the navy all vessels, from battle ships down to torpedo-boat destroyers, are equipped with wireless telegraphy, and the wireless telephone was successfully used at the grand naval review off Kobe last autumn. The wireless telephone is being studied in the department of communication and in the navy.

The United Wireless Telegraph Company on April 26 began the regular commercial operation of wireless telegraphy on the Great Lakes, general business and press messages being transmitted between its Chicago and Benton Harbor, Michigan, stations, and the steamers of the Graham and Morton Steamship Company. A practical demonstration of the operation of their system was given on the first day to about fifty business and newspaper men who were invited to take an eighty-mile trip on Lake Michigan on the steamer Puritan of the Graham and Morton Company. During the test, which lasted about four hours, the operator on the Puritan sent forty seven messages containing in all about 3,500 words, and received about 1,000 words from the Chicago and Benton Harbor stations. During the trip he also picked up a message being sent from a Savannah Line steamer off the Atlantic Coast to New York.

The first wireless press message ever transmitted between New York and Chicago, a distance of about nine hundred miles, was sent by the New York Times to the Chicago Tribune on the evening of May 3. The message was sent from the United Wireless Company's station on the roof of the Waldorf Astoria, and was received at the station of that company, which has recently been installed in the tower of the Chicago Auditorium annex. The Tribune, in its reply, made the suggestion that this might be the inauguration of a news gathering and distributing system that would laugh at sleet and wind storms. While the operator at the Waldorf-Astoria station was trying to call Chicago he intercepted messages from that city to Benton Harbor, Mich., from New Orleans to Washington, and also one which the Manhattan Beach station was sending to the steamer Coamo, seven hundred miles south of Sandy Hook. The first intimation that Chicago could be reached from the New York station came on the night of May 2, when the operator at the Waldorf-Astoria, after sending a message to Manhattan Beach was surprised to get a signal from Chicago that the message had been received there.

Marconi found that wireless messages can be transmitted to much greater distances at night than during the day. He believed that the smaller effect during the day was due to sunlight dissipating the negative charge of the antenna of the transmitting station. Dr. Mosler, as a result of investigations carried on in Germany for over a year, has measured the damping effect of the antennae at different times of the year and at different hours of the day, and has found that the damping effect is the same during day and night. He has further found that for transmitting messages to distances of 180 miles the energy arriving at the receiving station is exactly the same during day and night. Marconi's observation cannot be explained, therefore, by a photoelectric effect of sunlight on the transmit-

ting antenna. However, a considerable influence on the intensity was observed, when wave impulses from the Poldhu station, which was about 660 miles distant, were received at the station of the experimenter. But, also, this phenomenon shows that sunlight can have no influence on the transmitter, for in such case the change would manifest itself also at short distances. It proves, on the contrary, that absorption must take place in the intervening space, and that it increases with the distance. Therefore it must be assumed that the propagation of the energy, when it is transmitted to long distances, takes place in air strata of considerable height and that the final cause of Marconi's observations must be found in ionization.

The complaints of the steamship lines and others that the atmosphere in the neighborhood of New York harbor is filled with such a tangle of wireless messages that it is difficult to pick out any one aerogram from the mass makes one wonder whether, after all, wireless is an improvement, for ordinary use, over electric transmission by wire or cable.

Suppose that in a large department store or factory there were no way of sending messages from one room to another except by shouting with all one's might. Every one would hear all the messages, no matter for whom they were intended, and the man with the most powerful voice or the largest megaphone would drown out the others. How welcome would be the suggestion that a system of speaking tubes would conduct the sound just where it was needed without interference. In like manner, if wireless telegraphy were now our only method of communication, the man who should devise a means for conducting the messages along a definite path would surely be regarded as a great inventor. Yet this is precisely what we do when we use wires for electric telegraphy.

It seems logical to predict that, unless a practical method of "tuning" wireless receivers and transmitters is devised, wireless will be largely restricted in future to conditions analogous to those where shouting would be employed, such as cases where it is desired to reach as many persons as possible at a time, in all directions, as in signalling for help, and in locations where no direct conductors exist. This will restrict it very closely to use on shipboard.

"There is great difficulty in conducting comparative tests of receivers in actual radiotelegraphic stations," says J. H. Fleming and G. B. Dyke, in an article on that subject abstracted by the Electrical World, "but owing to the small radiative property of closed circuits, it is practicable to use two such circuits, one as a transmitting station and the other as a receiving station, separated by a distance of a few hundred yards; this is practically equivalent to stations with open oscillators at very large distances. Methods were described for producing in one of the closed circuits extremely constant damped oscillations by means of an induction coil or transformer, a spark-gap on which a steady jet of air is allowed to impinge, and a suitable mercury break. The receiving circuit consists of a small coil of insulated wire, which is pivoted in such a manner that it can be turned in any direction, the angular deviations with a condenser being measurable on scales. This circuit is joined in series with a condenser of variable capacity, and with the oscillation-detector to be tested. If the oscillation-detector is of the current-actuated type it is placed in series with the condenser; if of the potential-actuated type it is placed across the terminals of the condenser, being associated with a shunted cell and telephone if necessary, or with a telephone simply, if a magnetic detector is used. It is then possible to set this receiving circuit in such a position that it has no current induced in it by the oscillations in the transmitting circuit; but on turning it through a certain angle, sounds are heard in the telephone indicating the production of oscillations in the secondary circuit. The angle through which it is to be turned is a measure or indication of the sensitiveness of the detector."

The principal transatlantic steamship companies have commenced the publication of daily newspapers on all of their vessels while at sea. Each issue of the papers contains a summary of the world's news, stock market quotations, and the latest sporting gossip collected by the Associated Press in America and by Reuter in England. The Marconi people, through their wireless stations at South Wellfleet, Cape Cod, Clifden, Ireland, and Poldhu, on the English coast, are in communication at all times with the ocean liners and by this means transmit news to the different boats.

Major J. O. Kerby, an old-time and military telegrapher, and American consul at Para, Brazil, some years ago, is credited with having suggested the advisability of installing wireless telegraph stations on the Amazon River in South America, where it is impossible to maintain land-lines or cables.

Telegraphers in all sections of the country are investigating the prospects of engaging in wireless telegraphy, and are seeking advice regarding codes, systems and methods in use and other information that will prove valuable to them in preparing to make the change. Those who contemplate such action cannot do better than send for a copy of our catalogue of books on wireless telegraphy. An investment of $3 to $5 in books on this subject will furnish information that will give a person studying the same untold advantages over those who are content to take chances at "picking up" sufficient knowledge to carry them through. Telegraph Age, 253 Broadway, New York, carries in stock all books on wireless telegraphy. Write for catalogue and particulars.

F. A. Coleman, Manager for the Western Union at the Hotel Manhattan.

One of the most enterprising and successful of the many managers of the Western Union Telegraph Company in New York City is Mr. Frederick A. Coleman, who is stationed at the Hotel Manhattan. This hotel is largely frequented by the railroad officials and the most prominent men of the country, and Mr. Coleman has an extensive acquaintance among these gentlemen. He was born in Goshen, N. Y., March 7, 1855, and acquiring a knowledge of telegraphy at the age of eighteen, he was appointed general railroad ticket agent and manager for the Western Union Telegraph Company at the Westchester House on the Bowery, September 20, 1873. In 1874, he was transferred to a similar position at the Cosmopolitan Hotel, which at that time was one of the most important offices in the city. He remained in charge of this office until September 18, 1880, when he was transferred to the larger

FREDERICK A. COLEMAN.
Manager, Western Union Telegraph Company, Hotel Manhattan, New York.

uptown Windsor Hotel office, which was destroyed by fire ten years ago. After sixteen years' service at this important post he was again transferred on September 15, 1896, going to the Hotel Manhattan, where he has been manager since that time.

Mr. Coleman's long experience as a hotel telegraph manager has enabled him to form an extensive acquaintance among prominent people in all walks of life, and he has earned their esteem and confidence by his straightforward business methods. The great amount of general information which he possesses as a result of this wide acquaintance renders him especially well fitted for the position which he occupies.

Letters From Our Agents.

CHICAGO, WESTERN UNION.

R. D. Welch, who has been working for a broker at Des Moines, Ia., for some time past, has been assigned to the eastern switchboard.

H. J. Hefter is now the all-night chief in the Overland division.

C. H. Addison has been appointed chief of the St. Louis division, nights, vice A. B. Showalter, resigned.

V. H. Stevens, F. J. Daley and J. H. Gallagher, have been assigned to the quadruplex room, nights.

G. F. Gittings has been transferred from the quadruplex room to the eastern switchboard, nights.

J. L. Globinsky, who has been assisting C. F. Hauth in the Cincinnati division, has been appointed chief of the Indiana division, nights.

Joseph P. Shreenan, formerly of the Overland division, died in this city April 6.

Mrs. Joseph M. Sullivan, nee Riordan, who formerly worked in the Illinois division, died of pneumonia recently.

PHILADELPHIA, POSTAL.

G. W. Dunn through this column thanks the force for their kindness in contributing a beautiful floral tribute, upon the occasion of the death of his wife.

Daniel Carter, traffic chief of the Boston office, was a recent visitor.

American Telephone and Telegraph Company.

RESIGNATIONS AND APPOINTMENTS.

Mr. J. E. Gregory, formerly district plant chief at Kansas City, now holds a similar position at Nashville.

Mr. H. P. Fairman, district plant chief at St. Louis, has resigned, and has been succeeded by Mr. S. J. Ewald.

Mr. H. D. Roach, chief of the test room at St. Louis, resigned on April 1.

The St. Louis test room force is now as follows: L. P. Brazell, chief; Earle Harlan and F. C. Nitsche on the test board; D. B. Grandy and P. G. Trotter on duplex and repeaters; L. E. Whitmore on the Morse board; R. L. Ellidge, first night trick; D. L. Robeson, all night trick.

Savings and Loan Association's Convention.

The twenty-second annual convention of the New York State League of Co-operative Savings and Loan Associations, was held at Binghamton, New York, May 4 and 5. Many matters of vital importance to the 110,000 members of these associations in this State were discussed and acted upon. The Serial Building Loan and Savings Institution, of 195 Broadway, was represented at the convention by its secretary, Mr. Edwin F. Howell.

Action was taken on many proposed amendments to the State law, all with a view to safe-

guarding the interests of the members and making these institutions dignified, economical, and conservative. There were harmonious conclusions on all topics discussed, and it was the determination of the League to purify and keep the business close to the members.

Fifty Years of Continuous Service.

George H. Godfrey, manager of the Western Union Telegraph Company at New Albany, Ind., has occupied that position for fifty years. Although seventy years of age he is still hale and hearty. Mr. Godfrey says that so far as he can learn he has occupied the combination position of operator and manager of a city main office longer than any one else in the company's service. During his occupancy of this position he has received reports of all of the exciting events that have stirred up the country during the last half century, including all of the principal battles of the Civil War and the stories of the assassination of three presidents, but one of the most exciting times about the New Albany office since Mr. Godfrey has been in charge was during the celebrated steamboat race between the Natchez and the Robert E. Lee from New Orleans to St. Louis in 1870.

The Robert E. Lee, the winning steamer, was built at the old New Albany ship yards and was the pride of that institution. Large sums of money had been wagered in New Albany on the race and arrangements had been made to receive telegraphic reports on the progress of the event as the boats passed various stations along the river. The crowd that gathered at the Western Union office during the time the bulletins were being received was so great and so excited that the jam almost tore the building down.

United Electric Service Company Secures Franchise.

The United Electric Service Company, M. W. Ravens, president and general manager, of New York, has been granted a franchise to construct, maintain and use wires and other conductors, with the necessary poles, pipes, conduits and appliances, over and under the streets, avenues and highways within and belonging to the City of New York, for the purpose of operating an electrical signal system for the calling of messengers, an electrical burglar alarm system and fire alarm system. The United Electric Service Company was organized to overcome an objection raised by the Corporation Counsel, in the charter of the United District Messenger Company.

Obituary.

John T. Ward, aged forty-three, for many years connected with the Postal Telegraph-Cable Company, New York, died May 1 at Brooklyn.

Vitus David Miller, aged thirty-three years, of Louisville, Kentucky, who served telegraph interests at that place since he was fifteen years of age, died of congestion of the brain, April 23.

George S. Blank, until some months ago one of the chief operators in the main office of the Postal Telegraph-Cable Company, New York, died on May 10 in an insane asylum, of which he had been an inmate for the past four months.

G. L. Pine, aged thirty-two years, an operator in the employ of the Western Union Telegraph Company at Savannah, Ga., who left that city on a steamer bound for Baltimore on April 22, died on April 25. He had served in the Spanish War and in the United States Signal Corps, and had been in the employ of the Western Union Telegraph Company for the past five years.

E. J. McLaughlin, aged forty-five years, a native of Providence, R. I., who went West about six years ago for the benefit of his health, died at Las Vegas, N. M., on April 26. He had been a member of the Denver force for the past four years, and was well known in Associated Press circles in Providence, with which he had been identified for twenty years previous to his going West.

J. D. Dickinson, aged forty-seven years, a well-known telegrapher of Kansas City, died of consumption at that place May 3, after an illness extending over a period of many months. He was manager of the telegraph bureau in the office of the Kansas City Star for the Western Union Telegraph Company, until last fall, when illness compelled his retirement. He was an expert in all branches of the telegraph science and was popular with his associates as well as with the officials.

English Postal Telegraphers' Association Conference.

The annual conference of the Postal Telegraphers' Association of England took place at Southampton, April 17. In his opening address the chairman, Mr. R. H. Davis, expressed the dissatisfaction of the association with the concessions made by the authorities as the result of the Hobhouse report. A report recommending the formation of a National Federation of Postal and Telegraph Associations was referred back to the branches for further consideration. Resolutions were passed condemning the leasing of telegraph lines to newspaper proprietors, favoring the abolition of Sunday duty by females in trunk telephone departments, and demanding equal pay for men and women doing equal work. Other resolutions were adopted, and it was decided to hold the next conference at Sheffield.

General Mention.

In 1907 the telephone and telegraph companies purchased 2,311,651 poles, which was 65.9 per cent. of the total number of poles used in the United States.

Cedar poles formed in 1907, 63.3 per cent. of the total number of poles purchased in the United States. Chestnut poles were next in importance, forming 18 per cent. of the total.

An Elmira, N. Y., paper, a few days since, commenting upon the popularity of a telegraph operator residing in that city, stated that he was the only man who ever dared flag a fast passenger train to borrow a chew of tobacco from the engineer, without being instantly dismissed from the service of the company.

Mr. Maximilian Streu, a telegraph operator, residing at Numa, Iowa, who has for many years past persistently declared that he was the legal heir to the throne of Servia, ought now to have the opportunity to prove his claim. The world is advised that King Peter has announced his intention of quitting the throne of Servia at an early date and to reside in another country for the remainder of his life.

It is not often that overeagerness to attend to duty results disastrously to the person so affected. An operator in a small Pennsylvania town who, besides serving the telegraph company, runs a hardware store, was receiving an important message from Philadelphia recently, when the sending operator, who was not acquainted with the fact of his dual position, was horrified to have him break in with the exclamation, "Stop! I have to sell a shovel." In this case, as in many others, a woman, who by her insistence upon being waited upon induced the operator to make this serious break, was the cause of the trouble. The sending operator, not appreciating the circumstances and thinking that the receiver was playing a joke on him, reported the interruption to his superiors as wilful and unnecessary. As a result the man who was so zealous in the discharge of his duties is now likely to be discharged for neglect of the same.

Biennial Meeting of O. R. T.

The biennial convention of the Order of Railroad Telegraphers began its proceedings at Atlanta, Ga., on May 10, under the direction of President H. B. Perham. The delegates were welcomed by Governor Hoke Smith, of Georgia, and Mayor Robert F. Maddox of Atlanta. Governor-elect Joseph M. Brown also made an address of welcome. The visitors numbered about eight hundred, and it is expected that the sessions will last well on to two weeks, there being a large amount of routine, and important business to transact. An elaborate programme of entertainment has been provided for the delegates during their stay at Atlanta.

Why He Was Not Promoted.

He watched the clock.
He was always grumbling.
He was always behindhand.
He was stung by a bad book.
He didn't believe in himself.
He was willing, but unfitted.
He had no iron in his blood.
He asked too many questions.
His stock excuse was, "I forgot."
He wasn't ready for the next step.
He felt that he was above his position.
He did not put his heart in his work.
He learned nothing from his blunders.
He chose his friends among his inferiors.
He was content to be a second rate man.
He ruined his ability by half doing things.—Express Gazette.

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