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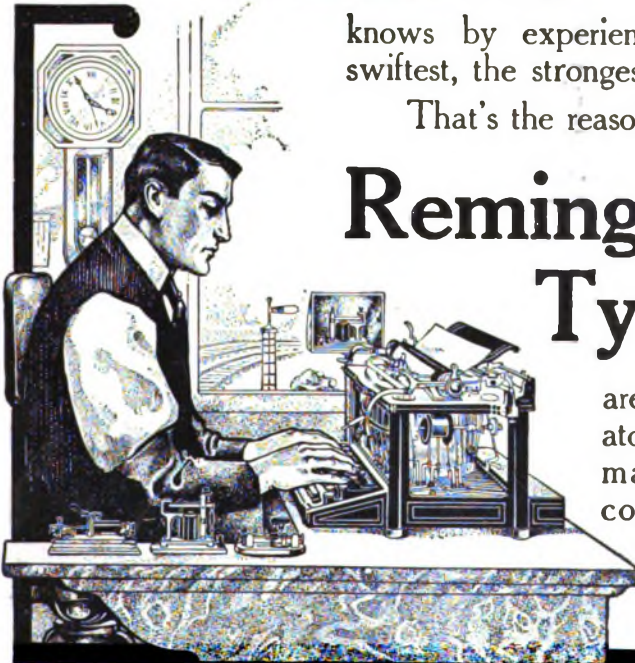
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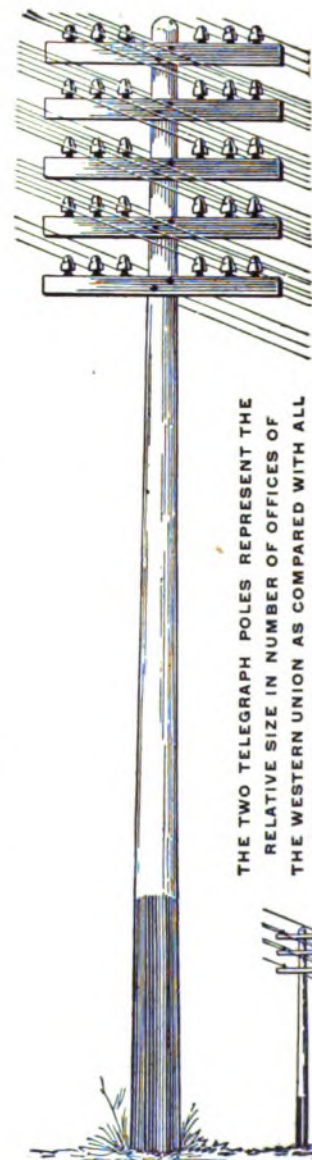
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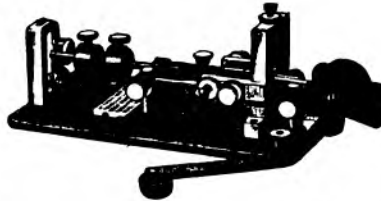
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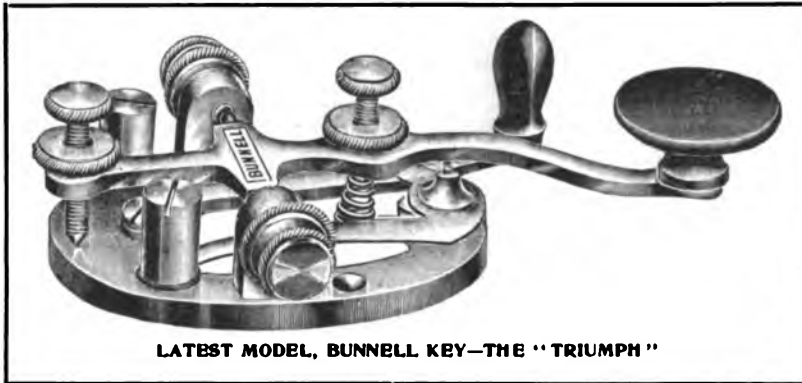
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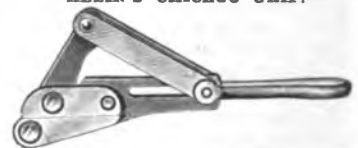
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No. 15.

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Twenty-fifth Year.

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SOME POINTS ON ELECTRICITY. Duplex or Grounded Loop Interruptions.

BY WILLIS H. JONES.

The fact that duplex or grounded loops are subject to a greater number of interruptions than single loops seems inexplicable to the unenlightened, at first when such an assertion is made, yet no one who has ever had even a limited experience at a loop switch entertains the slightest doubt as to the accuracy of the statement.

Take a given number each of single and duplex branch office loops and note the interruptions occurring in each class for any stated period. It will invariably be found that the total number of interruptions to the latter, principally in the nature of temporary openings, will exceed that of the former by a very high percentage.

Of course, this fact is known in a general way and admitted, but its significance is often belittled much to the chagrin of the loop chief, who is usually called upon to explain delays due to these almost undetectable sources of interruptions. Notwithstanding such interruptions are eventually located, the source is usually difficult to find owing to their peculiar and varied natures. The ordinary lineman seeking the source of such an interruption has really nothing to guide him. His order usually consists of the stereotyped form, "Close receiving of loop No. 2 between Ax and Fx," and in many

cases the loop "closes" long before he gets there. He has never served as a loop chief and in seeking trouble of this kind is often as ignorant of the true situation as the janitor in the basement, so far as the conventional form of his "order" enlightens him. It is a very simple matter for him to trace and repair an open break in a conductor, but not so easy a task to find the seat of an invisible equivalent of discontinuity; that is to say, find the location and source of a temporarily developed high resistance which causes a sounder to stand open while the local circuit itself is not actually broken.

Now, the purpose of this article is to call attention particularly to the necessity of loop and wire chiefs giving linemen more specific information as to the nature and possible seat of disturbances of this class when issuing an order, with a view of indirectly educating the fault-hunters by putting them wise to the actual situation. As a rule linemen assigned to this class of work are not only willing but eager to acquire a better knowledge of their calling and if they are properly enlightened in the manner suggested, a higher degree of efficiency will naturally result.

As no one will probably disagree with the assertion in the opening paragraph of this article as to the preponderance of disturbances occurring in grounded loop circuits, the matter may be dismissed with the explanation that such interruptions, referring specially to that class called "mysterious openings," are undoubtedly due to the comparatively low voltage used on local circuits as measured by the main line pressures, and which obviously cannot compete with the latter in breaking down or overriding small obstacles which though harmless on long circuits are often fatal in short ones.

Disregarding interruptions due to the carelessness of operators in leaving their keys open and the legitimate breaks in the conductors, which should be alike common and probably equal in number in both single and grounded loops, we will endeavor to show how the seat of many perplexing disturbances may be easily disclosed.

DEFECTIVE FLEXIBLE CORDS.

A flexible green cord and wedge looks about as innocent and inoffensive, as long as it discloses no visible sign of a break, as the bulb of the electric light which sheds its glow on that most treacherous and deceptive of all paraphernalia. It will lie like a sinner and never change color; deceive like a wizard and apparently "prove it" unless one has been too long in the service to be caught in this manner.

For instance, a loop is reported open. We cut in our test instrument and find it closed. Perhaps the moment we remove the test cord and wedge the loop again opens and later a second report is made. A repetition of the operation discloses no actual break and the natural inference is that someone may have had a key open temporarily. On a third complaint the cord is suspected, yet strange to say, the circuit cannot be reopened by any manner of twisting the cord, and again the natural inference is that the trouble was elsewhere. Finally on receipt of further complaints the loop chief, as a last resort, inserts an ammeter in the circuit at the desk before cutting in his test instrument and discovers that the circuit is not actually broken, but that a high resistance has developed and reduced the volume of current to such a degree that the sounder shows open. Of course, this fact may also be ascertained by holding the loop wedge in one hand and touching a big battery with the finger of the other hand. In a case like this the next move is to reinsert the loop wedge in its assigned spring jack and then press hard against the latter. If the sounder or transmitter at the multiplex set then closes, the seat of trouble is obviously in one of two places: in the cord wedge or the springjack, but in either case the opening is due to insufficient pressure against the wedge. The insufficient pressure in turn may be due to either of several causes; first, to a weak spring on the jack, or to a rusty hinge; second, to a shrinkage of the fiber underneath the brass blade of the wedge which results in an imperfect contact therewith; or, to a loosening of the wedge wrapper which permits the blade to withdraw from the fiber beneath it. Of course, the remedy is to either rip open the wedge end of the cord and rebind it, or remove and thoroughly overhaul the springjack, as occasion demands.

Now under identical conditions existing in a loop or a springjack a single loop would not open because the few ohms of additional resistance which such a fault would add to a long circuit would be so small in ratio to the normal resistance of the entire circuit that the normal volume of current therein would not be appreciably altered, hence the defect would not be noticed. The same amount of resistance added to a built-up duplex loop of, say, 100 ohms' resistance, creates an entirely different ratio.

In addition to this particular defect in flexible cords they are often treacherous owing to a few broken strands which are only harmful when the angle at which the cord hangs is such that the strain withdraws them from contact with others which at other angles help to bridge over the break, and thus preserve continuity. Of course, this fault may readily be detected, as well as that of a loose connection at the socket binding post, fuse holder, and other points in the circuit, but the first mentioned defect—the "mysterious opening"—will continue to cause trouble until the importance of rebanding or changing

suspected cords more promptly is realized. At present it is almost impossible to convince a branch office operator that a defect exists in his board of connectors as long as he "finds it closed" when he cuts in. In like manner linemen as a rule take no stock in invisible defects, or seek further for trouble that has "passed," yet in seventy-five per cent. of the openings reported the only way the loop can be closed is to request the branch office to cut in his test instrument at his board, and then when it closes patiently tolerate his stereotyped phrase: "Not here; was closed when I cut in!" This refers particularly to openings in the receiving leg of a loop.

Loop chiefs will all agree that the majority of openings of this class occur most frequently early in the morning and again soon after the exchanges close, thus suggesting either the absence of a wedge in the springjack in the morning, and the withdrawal of the same in the afternoon when the operators come down from the exchange floor. In each case a diminished tension of the spring on the jack is usually the seat of the trouble.

When such interruptions occur frequently in one office the signs of the difficulty are plain and instead of arguing the matter the cords and springjacks should immediately be thoroughly overhauled.

Recent Telegraph Patents.

A patent, No. 893,115, for an automatic vibrator for telegraph keys, has been issued to Frank T. Vail, of Minneapolis, Minn. A pendulum having a contact is supported by a frame so as to oscillate and close the telegraph circuit with a regular frequency for transmitting dots or dashes. Means are provided by which its effective length is changed when dots are transmitted.

The following patents have expired:

Patent No. 455,320, for a telegraph key, held by R. W. Green, of St. Thomas, Canada.

Patent No. 455,398, for quadruplex telegraph, held by F. D. Haskins, of Brooklyn, N. Y.

Patent No. 456,110, for automatic circuit closer for telegraph keys, held by J. W. Brown, of Van Wert, O.

Mr. F. E. Milligan, president of the National Telegraph Company, Rochester, N. Y., in a recent letter renewing the subscription of his company to Telegraph Age, writes: "We consider Telegraph Age one of the best papers of the kind published, in fact the only one that gives full information in regard to the telegraph situation the country over. We will gladly take advantage of any opportunity to recommend it."

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(Continued—Part 4.)

THE PERFORATOR—CONTINUED.

The punch block (29, Figs. 7* and 10)* is furnished with die, stripper and guide in which the twenty-five punches (eight upper, nine center and eight lower) move in perforating the tape. Lugs are so disposed on the various punches that the center group while not brought into direct contact with the punch levers, is carried forward with the movement of the latter and a middle row of holes is thus formed in the tape simultaneously with the upper and lower perforations.

There are three paper guides or idlers; one fixed (31, Fig. 7), one flexible (32) and one adjustable (32a). The latter, which is close to the punch block, is used for so regulating the height of the tape that the center row of perforations will be equidistant from the edges of the tape.

An indicator glow lamp (44, Figs. 7 and 9) to show when the limiting number of seventy-five characters has been prepared on a line, is operated by means of a worm (42) which is placed on the cam shaft, and engages a gear on which is mounted a pointer as well as an insulating disc with a metallic segment on its periphery. After about sixty letters have been punched, this metallic segment makes an electrical connection with a small brush through which a current flows into the lamp, the illumination of which serves as a warning that the end of a line is approaching. The pointer is reset to zero by pressing the indicator key (43, Fig. 7) of the keyboard which throws the gear out of engagement with the worm and permits the indicator to return to the normal position under the influence of a small flat-coiled spring.

The correct manner of starting the tape in the machine is to first place the paper roll on its reel so that it will unroll anti-clockwise, then thread it around the idlers or guides and through the punch block to the feed wheel. Next turn on the motor, and having knocked down such selector pins as may happen to be in the way of preventing the feed wheel from running freely with the motor, press the steel idler (52, Fig. 10) back from the feed wheel, and push the tape on to the wheel, which, while turning, will split the tape and carry it far enough forward to lay hold of with the fingers. Now release the spring barrel clutch by pressing back its key (39, Fig. 14), making sure that the pin of same is in one of the series of holes with which the spring barrel disc is provided. A pin in the feed wheel should be set up, and the spring barrel clutch released, after which (still keeping hold of the tape) a few of the key levers should be successfully struck, the effect of which will be to bring the tape out on to the feed wheel. Finally turn the feed wheel idler

around until it bears upon and holds the tape in contact with the feed wheel, and tear off the tape so that it may enter the chute and pass through the guide in front of the tape box and message desk (41, Fig. 7).

The various parts of the new perforator will be known officially by the numbers and titles given them in the following

TABLE OF REFERENCES.

No. 1, key buttons; No. 2, key levers; No. 3, punch bars; No. 4, feed bars; No. 5, universal bar; No. 6, universal bar fork; No. 7, second universal bar; No. 8, punch bar links; No. 9, punch bell cranks; No. 10, punch levers; No. 11, feed bar links; No. 12, feed levers; No. 13, feed cross levers; No. 14, universal bar hook lever; No. 15, clutch lever release and locking lever; No. 16, clutch lever; No. 17, motor gear; No. 18, idler gear; No. 19, idler gear; No. 20, idler gear; No. 21, clutch gear; No. 22, fixed cam; No. 23, cam shaft; No. 24, feed cam; No. 25, punch cam; No. 26, feed cam lever; No. 27, feed bail; No. 28, punch bail; No. 29, punch block; No. 30, punch returning bail; No. 31, tape idler; No. 32, tape idler; No. 32a, punch block idler; No. 33, knock down arm; No. 34, feed wheel; No. 35, feed wheel pins; No. 36, spring barrel shaft; No. 37, spring barrel clutch; No. 38, clutch ring cam; No. 39, spring barrel clutch release; No. 40, motor; No. 41, tape box and message desk; No. 42, indicator worm and gear; No. 43, indicator key lever; No. 44, indicator lamp; No. 46, clutch lever roller; No. 47, spiral gears; No. 48, feed spring with leather shoe; No. 49, spring barrel disc; No. 50, spring barrel; No. 52, feed wheel idler; No. 54, feed lever roller; No. 55, feed pin limiting stop; No. 56, flat bow spring; No. 57, knock down arm containing tube; No. 58, knock down adjustable spring; No. 59, feed wheel stop.

(To be continued.)

Personal.

Mr. Dennis F. Brown, of the Washington staff of the Western Union Telegraph Company, will take part in a competitive drill of the uniform rank, Knights of Pythias, at Boston, the first week in August.

Mr. Charles A. Tinker, of Brooklyn, former general superintendent of the eastern division, Western Union Telegraph Company, and Mr. James Merrihew, of Claverack, N. Y., who was associated with Mr. Tinker in the Western Union service, as general superintendent of the southern division, are off together up north on a fishing vacation.

Mr. W. N. White, of Covington, Tenn., a well-known old timer and a member of the United States Military Telegraph Corps, although recently having suffered a stroke of paralysis, from which, however, he has largely recovered, announces his intention to be present at the reunion at Niagara Falls on September 16, 17 and 18, if the state of his health at that time will permit.

Mr. A. L. Tinker, who for the past eight years has represented the Gamewell Fire-Alarm Telegraph Company in Berlin, Germany, in which country he has been successful in establishing his company's business upon a firm and permanent basis, has returned to make his home in

*The figures referred to in this installment will be found in the July 1 issue of Telegraph Age.

his native land, and in future will reidentify himself with the New York office. Mr. Tinker is a son of Charles A. Tinker, former general superintendent of the eastern division of the Western Union Telegraph Company, New York.

Alexander Graw, an old-time New York telegrapher, who holds the position of claim agent of the Baltimore and Ohio Railroad Company, at Youngstown, Ohio, was a recent New York visitor.

Mr. Frank L. Dyer, attorney for the various Edison companies, at Orange, N. J., has been elected president of these allied interests, and Mr. Carl Wilson, general manager, in place of Mr. William E. Gilmore, formerly occupying both positions, resigned.

Mr. S. H. Riker, district plant chief of the American Telephone and Telegraph Company, Troy, N. Y., was a recent visitor in New York, and took occasion to call upon many of his friends. Mr. Riker was formerly and for many years connected with the telegraph service at Syracuse, N. Y.

Mr. Harry C. Wilson, superintendent of the government telegraphs at Kingston, Jamaica, is spending his vacation in this country, dividing his time mainly between New York and Boston. Mr. Wilson is a brother of Arthur Wilson, of the Commercial Cable Company, New York, and of Frank Wilson, of Boston, formerly superintendent of the same interests at that point.

Dr. L. M. Rheem, of Minneapolis, the well-known physician and old-time telegrapher, whose frequent communications to Telegraph Age have always interested a large circle of readers, has abandoned the practice of his profession to engage in mining. As president of the New World-Lincoln Consolidated Gold and Copper Mining Company in Montana, the good doctor will delve into the earth, seeking reward in rich hidden treasure instead of ministering to the sick, as he has so successfully done in the past.

Le Taotai Chow Wan Pang, vice-director-general of the Chinese telegraphs; F. N. Dressing, foreign advisor to the Chinese telegraph administration, and Mr. Yung, traffic superintendent of the Chinese telegraphs, all of Shanghai, and members of the Chinese delegation to the International Telegraph Conference, lately held in Lisbon, were recently in New York. While in the city these gentlemen were entertained by Clarence H. Mackay, president of the Commercial Cable Company, and also by L. G. Martin, the cable and telegraph expert of the Okonite Company. The visitors sailed on their homeward voyage from San Francisco on July 23, on the steamer Korea.

No up-to-date telegrapher can afford to be without TELEGRAPH AGE. It furnishes him with information essential to his welfare. Send for a sample copy.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mr. Charles C. Adams, vice-president, who went to Denver, to look after company interests, during the week of the convention, was enthusiastic in his praise of the work accomplished. He stated that he never before saw so many expert senders assembled in one city. Every man who was entrusted with a key appeared to be a star of the first magnitude. Mr. Adams not only praised the local Denver force, but also those who were assigned to that point from other places to help out during the rush. Mr. Adams is now absent on his vacation and will spend his time on the New England coast.

Mr. Edward B. Pillsbury, general superintendent of the company, has had conferred upon him by the University of Maine, his alma mater, the degree of bachelor of science. Mr. Pillsbury was one of two selected for this honor out of a list embracing 1,500 names.

Mr. F. E. d'Humy, assistant electrical engineer, is rusticated at Petersburg, N. Y.

Mr. Morisaburo Tonegawa, of Tokyo, electrical engineer of the Department of Communications of Japan, who is in this country on a tour of telegraph inspection, was a visitor recently at the office of Minor M. Davis, electrical engineer of the company. Mr. Tonegawa was interested in making an examination of the Rowland printing telegraph system.

Mr. S. B. Haig, traffic manager, after completing his special work at Denver, occasioned by the recent convention, extended his trip to various other cities in the Western division, visiting them in his official capacity for the benefit of the service, has returned and is once more at his desk.

Mrs. H. A. Tuttle, of Minneapolis, wife of Vice President and General Manager Tuttle of the North Telegraph American Company, was a recent visitor to the operating department under escort of General Superintendent Pillsbury, and was much interested in the operation of the Rowland system.

RESIGNATIONS AND APPOINTMENTS.

Mr. F. N. Roberts, for many years affiliated with the head of the operating department at Chicago, has been appointed chief operator of that office, vice J. E. Pettit, resigned.

Mr. Earl W. Miller has been appointed chief operator at Philadelphia, vice Geo. W. Dunn, who has been transferred to the traffic department, and P. McElroy has been appointed assistant wire chief.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Among the executive office visitors recently were I. McMichael, of Toronto, Ont., vice-president and general manager of the Great North Western Telegraph Company; Jacob Levin, general superintendent of the Southern division of the company, and J. S. Calvert, assistant superintendent, of Atlanta, Ga.; T. P. Cummings, manager, at New Orleans, La.; and Thomas F. Clark,

chief operator at Boston, and George A. Burnett, of the Great Northwestern Telegraph Company, Buffalo.

The many friends of Allen C. Woodle, manager at Boston, learned with much regret of the drowning of his son Henry, aged thirteen years, while in bathing at Melrose, Mass., on July 21.

RESIGNATIONS AND APPOINTMENTS.

Miss Mary Littell has been appointed manager at Lake Charles, La., vice A. O. Boudreaux, resigned.

The Cable.

Mr. E. Grigg, superintendent of the West Indies and Panama Telegraph Company, at St. Croix, W. I., is in this country on a vacation, reaching New York, July 22.

At a recent meeting the New York Chamber of Commerce adopted a petition, prepared by the committee on foreign commerce, to the State Department asking that the matter of better protection for the transatlantic cables be taken up by the British Board of Trade.

Cable communication was interrupted July 28 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Lanzarote (Canaries)	May 18, 1908

Messages go by steamer from Las Palmas.

The English Postmaster-General has appointed a committee to inquire whether injury is caused to submarine cables by the operations of trawlers; and, if so, to consider and report what steps it is desirable and practicable to take to prevent such injury. The Chairman is Sir J. C. Lamb, C.B., C.M.G. Mr. F. J. Brown, of the secretary's office, general post office, will act as secretary, to whom all questions of evidence should be submitted.

Municipal Electricians.

A patent, No. 893,125, for a selective signaling system, has been granted to Garrison Babcock, of Chicago. A selective ringing system for party lines has means for sending selective impulses over the line to polarized electromagnets at the sub-stations.

The International Association of Municipal Electricians will meet in annual convention at Detroit, Mich., on August 19, 20 and 21. The following papers will be read on the occasion: "Combination Cables for Fire and Police Signal Systems;" "Moving Picture Hazard;" "Batteries for Signaling Systems;" "Testing for and Locating Faults in Electrical Transmission Lines;" "Electrical Equipment of a Fire Station;" "Modern Police Signal System."

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

Radio-Telegraphy.

The United Wireless Telegraph Company has established a wireless station at the Ten Eyck Hotel, Albany. This adds another to the hotel chain of this system which now includes the Plaza and Waldorf-Astoria in New York, and the Bellevue-Stratford in Philadelphia. The company will also similarly equip the boats of the Hudson River day and the Albany night line steamers.

In a recent interview with a representative of a London daily newspaper, Mr. William Marconi stated that he has lately been experimenting with duplex wireless telegraphy. The experiments, he said, were quite successful over a distance of three or four miles. He anticipates equal success over the Atlantic Ocean before long. The present speed of transmission across the Atlantic, in one direction, is twenty-four words per minute. He also referred to another of his recent experiments. Its object is to enable a ship approaching the shore, or another ship in a fog, to determine exactly the position of the wireless station on shore, or the course of the other ship.

In future the United States Signal Service will include in its equipment a device embodying complete wireless telegraph outfits, which will be carried on the backs of two mules. The device has been perfected to such a degree that operators can begin sending messages within a half minute from the time the mules are stopped and the packer begins to unload the outfit. The device is to be tried for the first time in the Far West, under the personal direction of Colonel Richard E. Thompson, of Seattle, Wash., the chief signal officer of the department of the Columbia. The kit consists of receivers, transformers and a one-eighth kilowatt generator. There is also a small telescope pole, which by means of hidden springs can be erected to a height of sixty feet in the air, with all the necessary wires and appliances connected in the fraction of a minute. The difficulty found in the device in previous trials has been that it was not powerful enough to send or receive messages for distances greater than eight or ten miles. New methods and slight changes will be tried by Colonel Thompson, and it is hoped that the communicating distance can be increased to fifteen miles.

Mr. N. E. Smith, superintendent of telegraph, of the New York, New Haven and Hartford Railroad, New Haven, Conn., has this to say respecting Telegraph Age: "I beg to hand you herewith check covering renewal of my subscription to Telegraph Age, and to say that if the journal cost ten times as much as it does, I should be amply repaid in subscribing for it. I look forward to its periodic coming and should feel lost without it. It is a publication full of valuable and interesting information and I trust that your subscription list will be increased a hundred-fold during the coming year. I am glad to add my simple testimony to its value."

To Perpetuate the Society of the United States Military Telegraph Corps.

Like the Society of the Cincinnati, established in 1783 to perpetuate the friendship of the surviving officers of the Revolutionary Army, the Society of the United States Military Telegraph Corps, has provided means for perpetuating the latter organization. The United States Military Telegraph Corps of the Civil War was organized into a society in 1882, its first reunion taking place at Niagara Falls, in September of that year. As there are now less than two hundred survivors of the Civil War corps it was realized that something should be done to perpetuate the society. Accordingly an amendment to the constitution was proposed by D. H. Bates, at the reunion of 1905, held at the Waldorf-Astoria, New York City, but it was not finally acted upon until recently.

The following is the text of Article VI. so far as it refers to the matter:

"All persons of good standing, who were members of the Military Telegraph Corps at any time from the beginning of the War of the Rebellion to the disbandment of the corps, and the sons and male descendants of such members, shall be eligible to membership in this society."

Already quite a number of sons have received their certificates of membership in the society and additional applications are being received frequently.

All applications should be addressed to the secretary, Mr. D. H. Bates, 658 Broadway, New York City.

The Military Telegraphers and Telegraph Age.

No body of telegraphers are held in higher esteem than those who in their professional capacity served army interests actively in the field during the Civil War. Their deeds were influenced by motives of patriotism, and furnish many fine examples of intelligent performance, self abnegation and heroic devotion to the cause in which they were enlisted. To promote the welfare of these men, whether regarded as individuals or as component parts of the Society of the United States Military Telegraph Corps, has ever been the purpose of Telegraph Age. Many of these military telegraphers are subscribers to this journal and those who are not are missing a good deal they would like to know, for the paper prints much that is of value and interest to them, both in reminiscent matter of valorous deeds performed in the army and in urging of government measures calculated for their benefit. Moreover, much that is of current interest respecting the organization finds a place in these columns; in fact, there is something in every issue that appeals to the consideration of these military telegraphers, and the hope is expressed that each one may deem it to his advantage to place his name on our subscription list and so receive the paper regularly.

Bargains in Books.

The following list of electrical books, standard in character, are offered at a bargain price—twenty-five cents apiece. They will be sent to any address on receipt of a quarter of a dollar, carrying charges to be collected. The volumes, while a little shopworn, are otherwise as good as new, and at the low figure offered afford an excellent opportunity to secure valuable library additions for a very small sum. Address in ordering J. B. Taltavall, Telegraph Age, 253 Broadway, New York. The offering includes:

Four volumes of "Telegraphy," by Prece and Sivewright; two of "Electricity Made Easy," by Houston and Kennelly; two of "Telegraphers' Hand Book," by Hegel; four of "Patented Telephony," by Amn. Elec. Eng. Assn.; three of "Telegraphists' Guide," by Bell; one of "Street Railways," by Fairchild; twenty-two of "Manual of Diagrams," by F. W. Smith; four (board cover) and five (cloth cover) of "Handbook of the Electro-Magnetic Telegraph," by Loring; two of "Gleanings," by Booth; two of "Electro-Plating," by Trevert; one of "How to Become a Competent Motorman," by Livermore; two of "Incandescent Lamp," by Randell; one of "Metric System," by Hartford Steam Boiler Insp.; one of "Arithmachinist," by Goldman; one of "Dynamic Electricity," one of "Electric Lighting," by Morton and Anderson; one of "Electric Telegraph," by Sabine; one of "Electricity—100 Years Ago and To-Day," by Houston; one of "Electricity Up-to-Date," by Verity; one of "Dynamo Construction," by Urquhart; one of "Telephone Service," by Webb; one of "Synopsis of Current Electrical Literature," by Osterberg; one of "Mossman's Code," one of "Evolution of the Electric Incandescent Lamp," by Pope; one of "Laboratory Manual of Electro-Therapeutics," by Herdman and Nagler; one of "Electricity and Electrical Engineering," by Fiske; one of "Mechanical Art Simplified," by Dixon.

Professor Dolbear.

In the tranquil evening of his life Professor Amos E. Dolbear, a scientific seer, some of whose visions have become material facts, although he has not reaped the material reward, still keeps in touch with the great problems of physical research in which he is no longer able to take an active part.

Somewhat broken in health and unable to do laboratory work or to write except with great difficulty, Professor Dolbear spends most of his time in reading or in converse with friends whom his scientific attainments and the charm of his unaffected and simple manner gather round him. The best years of his life have been devoted to Tufts College, to which his fame has attracted hundreds of ambitious students, and yet when the time for his retirement came the college was too poor to continue his salary. The chief source of his income is the Carnegie pension fund.

Morse Electric Club Outing.

The Morse Electric Club achieved distinction by its initial outing celebrated at Cove Hotel, Staten Island, on the afternoon and evening of Saturday, July 18. It was a Western Union demonstration. In addition to the local contingent, who turned out most loyally, there were also present a number of representatives from out of town, besides numerous friends. Altogether about one hundred and fifty persons enjoyed the hospitalities of the occasion so freely extended. The cable tug "Western Union," which had been placed at the disposal of the committee by the kindly action of Colonel Clowry, made two trips to the island, at one and three o'clock, respectively, conveying club members and their friends direct to the grounds.

Belvidere Brooks, general superintendent of the Eastern division, who also attended the outing, made the trip down in his yacht "Wacoutah." He had with him as his guests J. B. Van Every, M. T. Wilbur, William Holmes, A. G. Saylor, J. C. Willever, F. E. Clary, F. J. Scherrer, Lawrence Barnum, W. Pullen, W. N. Fashbaugh, Joseph Brooks and R. J. Murphy.

The weather was delightful, and the athletic sports, in varying form, which were the features of the occasion, were very generally participated in. The entire party seemed to be out for a good time, and manifestly secured the object of their quest. A game of baseball played between two picked nines proved to be the event of the day. The spectators who lined up to witness the exhibition of skill displayed by the experts engaged, observed much to stimulate thought, kindle imagination and arouse hope, as well as to excite amusement, for it must be admitted that much that was comical occurred to punctuate the work of the men at the bat and in the field as the game progressed. The demonstration proved, even if many of its participants had sore bones and experienced tired feelings for several days thereafter, borne in sad reminiscence of the affair, that telegraphers are a versatile folk, if not equally proficient at the bat as at the key, then—well, nearly so. To say that Belvidere Brooks and A. G. Saylor umpired the game, put at least a kind of official decision on the rulings rendered, being accepted as "for the good of the service," thus fortunately shutting out all discussion, notwithstanding some rank decisions unhesitatingly given on balls and strikes. Close observers noticed that the foreign element, so-called, engaged in the game, because of their peculiar alertness and prodigious efforts, were apparently keenly solicitous to guard the good name of the respective localities from which they hailed. It was therefore no wonder that whenever T. P. Cummings, manager of the New Orleans office, came to the bat he made a home run. Atlanta, Ga., was not to be outdone by the Crescent City, and its representative, J. S. Calvert, the assistant superintendent at that point, frequently lambasted the ball all over the twenty-acre field. So, too, was

the valor exhibited by W. H. Spry, manager of the Newark, N. J., office, for he had his revenge on old-time associates whenever he had the opportunity to put players out. The work, both in the field and at the home plate of Captain Thomas F. Clark, the popular chief operator of the Boston office, was of such a character that it was easily discernible that this savant of Eastern civilization possessed a very limited acquaintance with the national game in all of its details. This was illustrated when one of the New York chief operators, taking exception to a feature of the play, ventured to dispute the point with the worthy captain, when the latter was heard to remark with a fine assumption of authority at once indicative of superior knowledge, that he would have his way, or he would have the kicker removed from the "eastern switch" on his return to telegraphic work.

The unwonted excitement aroused by the game was responsible, it was said, for the bold exclamation attributed to Charles H. Murphy, of the time service, usually so mild mannered, to the effect that whether or not his clocks ever went again, he would punish those who endeavored to stop the balls that received momentum from his bat.

On the other hand, Frank J. Scherrer, more phlegmatic in temperament, and perhaps because of his diplomatic training, preserved a more nearly even poise, and took no chances of getting his temper ruffled or of bruising his fingers. In fact, with rare good judgment, he selected the easy position of right field and then skilfully and with wonderful composure of mind, utilized the services of an umbrella to catch the balls that came his way.

The tall form of M. J. O'Leary was seen speeding around the field with a tense and expectant look on his face as though he expected to seize in eager grasp a bunch of Telegraph Mutual Benefit applications at every base. He, however, was doomed to disappointment, for like missing the elusive fountain of youth, Mr. O'Leary failed to reach his goal. While it is claimed by some that Gardner Irving distinguished himself on this hard fought battlefield of the ball, truth compels the statement that his habit of knocking a score or more of foul balls every time he presented himself at the bat, was a source of irritation to the umpires.

There were other New York players who gallantly took part in this memorable ball game, an achievement the recollection of which will go down through the ages. Among them were: Harry P. Dunn, D. L. Doran, J. F. McGuire, Lawrence Barnum, George Messner, William Merley, J. A. Dierks, Frank Fitzgibbons, J. P. Riley, Harry Durland, C. F. H. Johnson, W. Pullen and A. M. Lewis.

At the conclusion of the first inning a number of the players, beginning to show signs of exhaustion at the unwonted exercise, cast about for substitutes, offering liberal sums for any who would take their places and finish the game. No

payment however alluring in amount could tempt anyone present to step in and change existing conditions, for those watching the sport were deriving too much merriment from the scene they were witnessing. Special efforts were made to induce C. B. Dunham, manager of the Canso, N. S., cable station, who was an interesting spectator, to take part in the game. Mr. Dunham, however, was not to be persuaded, thereby exercising excellent judgment, as is his custom in an emergency, and continued to remain seated on the uppermost row in the grandstand. Another gentleman who with great difficulty resisted the efforts to induce him to take part in the field, was Mr. John C. Willever. Mr. Willever evidently had in view the desirability of resuming his official duties in the executive offices on the following Monday, rather than to take any chances of being obliged to resort to arnica and bandages.

Besides the umpires the next best abused man was the scorer, Edwin F. Howell, secretary of the Serial Building and Loan Savings Institution. It appears that he did not register runs fast enough to suit some of the players, and when he announced that the game had been won by the winners by a score of 16 to 14, many declared it would be Mr. Howell's last chance at a score card.

After the excitement due to the ball game had in a measure quieted down, running races were indulged in with results quite as grotesque as in the field game. A special fat men's race was announced between Belvidere Brooks and H. L. Shippy. It was generally admitted that Mr. Brooks crossed the line first, but in order to preserve, it was said, the *entente cordiale*, the first prize was generously awarded to Mr. Shippy, just to prove that no hard feeling existed between telegraph officials and manufacturers of iron and copper wire. A second fat men's race that enlisted much enthusiasm followed the notable performance of Messrs. Brooks and Shippy. This resulted in the first prize being awarded to William Marshall, of Condenser fame; the second to Judge J. T. Laidlaw, head of the Barclay printing telegraph department, and the third to M. J. O'Leary, secretary of the Telegraphers' Mutual Benefit Association. Still other interesting races were won by William Merley, J. P. Riley, A. M. Lewis, Thomas F. Clark, of Boston; R. J. Murphy, W. A. Schuck, Joseph Connolly, B. H. Reynolds, Harry Durland, C. F. H. Johnson and James F. Nathan, of the central cable office. The latter was an eager participant in each race, and notwithstanding his manifest activity and enthusiasm the judges for some unexplained reason failed to bestow upon him a single prize, all of which goes to show that judges, as it has been sometimes remarked, are not always above suspicion.

This account would not be complete if it failed to chronicle the firm and dignified mien sustained during the entire time of the outing by President J. B. Van Every. He stoutly resisted all efforts to induce him to enter the ball game or

join actively in any of the other sports of the occasion, and remained an impassive, albeit an interested, observer of all that occurred.

At seven o'clock about one hundred of the party sat down to dinner, which was presided over by President Van Every. After coffee had been served about fifty prizes were drawn for and distributed among the members. The entertainment committee, of which M. H. Kerner was chairman, did its work well and earned the thanks which were freely bestowed upon them.

Among those present at the dinner were: J. W. Behre, G. R. Benjamin, J. Berry, E. E. Brannin, C. J. Bresnahan, Jos. Cahill, J. A. Carberry, E. G. Carley, A. R. Carmichael, C. W. Conklin, J. W. Connelly, J. A. Dierks, D. L. Doran, L. Dresdner, H. Durland, W. G. Evans, William Finn, F. E. Fitzgibbons, C. H. Gaffney, F. M. Gallagher, D. J. Gallagher, R. F. Geissler, J. W. Gibbons, J. L. Hall, T. F. Harvey, M. J. Hayden, F. Heller, E. F. Howell, G. Irving, C. Jacobson, C. F. H. Johnson, W. A. Jones, A. F. Kelley, M. H. Kerner, C. A. Kilfoyle, Frank Kitton, A. Kline, J. T. Laidlaw, J. P. McConnelly, J. McCusker, J. F. McGuire, W. Marshall, W. C. Merley, G. H. Messner, C. H. Murphy, R. F. Murphy, R. J. Murphy, A. Nachmann, B. Nachmann, J. F. Nathan, M. J. O'Brien, R. O'Brien, M. J. O'Leary, Capt. Olmstead, R. F. Parkinson, W. E. Rath, H. Reece, B. H. Reynolds, J. P. Riley, Geo. Roehm, F. J. Scherrer, J. W. Schmults, W. D. Schram, W. A. Schuck, H. V. Shelley, J. Simmonds, T. G. Singleton, Dan. Skelton, H. A. Smith, H. Smith, W. H. Spry, J. B. Taltavall, R. Tollison, J. C. Turner, E. B. Van Every, H. F. Van Every, J. B. Van Every, J. Veitch, A. O. Wallis, Mr. West, M. T. Wilbur.

Atlanta, Ga.—J. S. Calvert.

Boston—T. F. Clark.

Canso, N. S.—C. B. Dunham.

Cincinnati, O.—C. R. Tilghman.

New Haven, Conn.—F. E. Clary.

New Orleans—T. P. Cummings.

Specifications for Hard-wood Copper Wire.

At the Atlantic City meeting of the American Society for Testing Materials, says the Electrical World, Messrs. W. H. Bassett and J. H. Clapp presented a paper calling attention to the desirability of introducing standard specifications for hard-drawn copper wire. The authors stated that no two of the specifications already in existence agree as to what should be the minimum permissible tensile strength or variation in diameter, while many of them include other requirements, such as a minimum elastic limit, a minimum number of twists made in different ways and on different lengths of wire and at different rates of rotation. The authors said that the specifications for hard-drawn copper should be standardized as have those for other more common engineering materials.

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

Life in the Submarine Cable Service.

BY ROLAND BELFORT.

In Standard Weekly Supplement to "Empire."

So accustomed have we become to the continuity and regularity of our admirable submarine cable system—that splendid monument to British bulldog pluck, financial enterprise, and scientific ability—that we accept the most remarkable developments merely as a matter of course, and pay but languid attention to the services rendered by those alert, indefatigable sentinels of empire who carry on this truly imperial work throughout the world, frequently under difficult, and even dangerous circumstances. A gratifying feature in this connection is that the majority of these cablists are British. Men of many nationalities, notably Frenchmen, Germans, Italians, are engaged in the various branches of cabling, it is true, but only in limited numbers, and they are rarely able to emulate the British operators in either speed or accuracy. Even United States companies generally employ British operators, their telegraphers, although extremely clever, never having proved themselves equal to the task of rivaling the British in cable telegraphy. Generally speaking, the foreigner fails to realize the importance of speed and the indispensability of concentration in a profession wherein "rush" is the watchword.

Associated with the development of the world's system of cables, now aggregating about 250,000 nautical miles, is some admirable scientific, technical and administrative talent.

Over twenty thousand men and a big fleet of forty-five ships are at present engaged in the different branches of cable work—manufacturing, laying, repairing and operating. Directors, managers, superintendents, engineers, electricians and operators must all be smart men in their respective departments, for in this profession there is absolutely no room for a dolt. A resourceful mind, prompt action, personal courage, devotion to duty, and a contempt for danger are all required in the performance of their delicate duties. Wonderful zeal and energy are displayed by cable men, in peace and in war.

It would be difficult to imagine a more attractive career for an adventurous young man than that which is offered by service in any of the big cable companies. There is no exaggeration in saying that he could, by judicious changes of companies travel right round the world in the practice of his profession in the course of ten years. One man who started as an operator on a lonely Atlantic island, is now vice-president of a leading cable company, with an income of quite £10,000 a year. Several who started on the lowest rung of the ladder are now managing directors of their companies. Hundreds are now occupying lucrative positions in the various cable stations throughout the world, with salaries ranging from £500 to £2,000. Most of the promotion being effected from the inside, clever men have excellent chances of securing good posi-

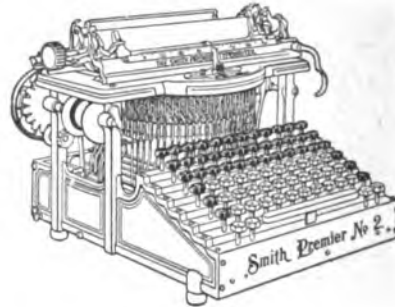
tions by the display of exceptional talent and enterprise.

How are cablists trained? Some of the smartest have been recruited from the British postal telegraph department; many have graduated as messengers in the city offices of the leading cable companies; others have been trained in the schools maintained by some of the companies at their coastal stations. Recently the tendency has been toward attracting recruits of a higher social grade—boys from the public schools, sons of military and naval officers, clergymen and professional men. This will appear quite natural when it is considered that the salaries paid are generous, and that the general arrangements made for their staffs by the leading companies are quite equal to those made for military officers on foreign service. These companies always provide comfortable, even luxurious, quarters, especially at the most isolated stations, so that wherever a cablist goes he finds a hearty welcome, a fine mess, reading rooms, billiard rooms, cricket grounds, tennis courts, boating facilities, and sometimes a theater. He gets three months' leave every three years, and can make certain of a pension at the age of sixty-five in most companies. Practically, a post in an enterprise like the Eastern Telegraph Company is as desirable as a government appointment, the fixity of tenure being equal, while the financial conditions, facilities for delightful travel, chances of promotion, and variety of adventure are frequently superior. The most famous cable training school is "P.K."—the Eastern Telegraph Company's station at Porthcurno, on the Cornish coast, between Penzance and Land's End. The period of training varies from three to six months, according to the aptitude of the cadet, and the company sends telegraphers to nearly every quarter of the globe.

Every globe trotter knows the cablists; the more isolated the station the greater will be his welcome. They may be seen playing football or cricket in Cornwall or Ireland; haunting the gay boulevards of Marseilles, Brest, or Havre; luxuriating in a stately castle near Lisbon; bathing in the Red Sea or drinking of the waters of the Nile; sweltering, but active, at Aden, Zanzibar, Mozambique, Mauritius, and at various coastal points throughout India. Some are buried away in deadly spots in the middle of the Atlantic or the Pacific. Others drag out a weary existence on the West Coast of Africa or the remotest regions of Australia. There are torrid stations in the Red Sea and the Persian Gulf, where it rains only about once a year, while damp spots exist like Hong Kong, where fungi grows in one's boots during the night. Along the coasts of Africa and Brazil, Peru and Bolivia, are some horrible stations where the white man can only live with difficulty.

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AUGUST 1, 1908.

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

Confiscatory Proceedings.

Some of the states of the West must be bent upon a war of telegraph extermination within their respective boundaries, if their several and continued actions directed against the telegraph companies be accepted as evidence of such a course. The latest move, that by the state of Iowa, takes the form of a suit in which the Western Union Telegraph Company is made the defendant for the snug little sum of \$898,500 for alleged violation of state laws in regard to foreign corporations. The petition consists of two counts. The first is for \$100,000 for failure to pay the customary fee on capital stock, and the second, for \$798,500, represents the penalty fixed by law for

each day the company has been doing business in the state in violation of the state law.

We don't know the value of Western Union property within the state of Iowa, although doubtless it is less than half that of the amount demanded in the suit, but it might be well in the face of these virtually confiscatory proceedings for the company to throw up both hands and retire incontinently from such an inhospitable territory. Perhaps an intelligent court of high appeal, sustained by an aroused and better public understanding, will eventually come to the rescue of corporations that now appear to be but a target for state and municipal greed. It cannot be said that honesty of purpose is always lodged in the representation of the "dear people."

The Filing Time Rule in Georgia.

It is difficult sometimes to repress a smile, even when resentment is felt, when one observes the incongruities that unexpectedly, and not infrequently with grotesque effect appear as the result of would-be regulation of public utilities; too often, more's the pity, undertaken ostensibly in defiance of correct thinking and of proper knowledge. Abundant illustration of this fact is afforded by the laws and rules adopted in several of the states requiring the filing time to be incorporated in all telegraph messages so far as all such for intrastate delivery are concerned. So confusing is the situation that has arisen in Maryland as a result of the operation of the law in that state, which is of legislative enactment, that, as explained in our issue of July 16, the matter has been carried to the courts for its proper interpretation. The point raised, and a very pertinent one, is who shall pay for the additional words required to express the time of filing.

In Georgia a rule prevails, prescribed by the railroad commission of that state, similar in authority to the Maryland law, of which the following is the text:

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

This decree appears to be honored by the people of Georgia more in the breach than in the observance. This may be readily accounted for because of the fact that the burden of cost imposed by the added words incident to including the filing time is placed upon the public, for seldom, be it observed, is an ordinary message compressed within a narrower com-

pass than the customary ten words. Obviously the responsibility for the extra charge for additional words is put where it belongs, if, indeed it is to be made at all. But at this the people object, declining to be compelled to pay for something they don't want, and very naturally so.

We do not recall that the reliability of the telegraph as a common carrier in the State of Georgia has seriously been called in question. It is only in times of great disturbance, incident to storm and flood, or strike disorder, as was the case last year, a matter, however, of rare occurrence, that the wires are ever in such shape as to delay telegraph traffic. The prevention of troubles of this nature are not usually within the province of man's control. At such times the telegraph companies promptly give notice of existing conditions. Certainly no situation has arisen, or popular outcry made, warranting interference with existing methods of telegraph administration and management. Manifestly the telegraph companies are and have been rendering satisfactory service, that which cannot be impeached. This may be also interpreted as applying with broader meaning to cover the territory of the nation itself.

Apparently the people of Georgia resent or are indifferent to officious meddling which this filing time rule saddled upon their state is looked upon as the outcome. Our advices received from all parts of the state indicate that business men, who there as elsewhere, constitute the vast majority among the users of the telegraph, profess satisfaction with the service, and who in sending their dispatches ignore and raise no question regarding the filing time proviso. They know full well that if necessity arises requiring specific identification of time in message sending or receipt, that the telegraph companies may be strictly relied upon to furnish them such information without question or delay. It was a mistaken sentiment that called into existence a filing time law. Up to the present time we are not aware of a single individual insisting upon an observance of the rule.

Aftermath of the Strike.

While the event of the telegraphers strike of nearly a year ago has passed into history, the observing mind will note with mingled feelings of regret and pain the effects of its blemishing influence so frequently discernable. This is especially true in the larger telegraph centers. Many a striking operator whether re-serving to-day at the key, or finding his livelihood as best he may, outside of the telegraphic ranks, is confused and dazed at the condition in which he finds himself. Some are not yet able to discuss fully the direction in which their true advantages lay, even under reemployment, and are wavering in an uncertainty of mind apparently unwilling yet to declare

allegiance to employing interests, a condition not creditable to their manhood nor calculated to promote their future success.

Every one in order to be honest with himself, and every man is his own creditor, should possess and exercise an honest mind. An honest mind is more apt to distinguish clearly, to take a wholesome view of life; it will dictate honesty of motive and action in all relations affecting the well-being of employer and employe alike. It stands for something real, vital and compelling. If the individual has found reinstatement his duty lies wholly to the company that pays him his wages, with which in turn he buys his daily bread. To those interests, and those alone he owes unswerving loyalty. If his pay is not what it was before he assumed to take measures into his own hands to compel a readjustment in the scale of company relationship, let him remember that the fault does not lay with the company, but because he himself deliberately severed old relations, and that now in a sense he occupies the position of a prodigal. It is easy to break confidence but hard to restore it.

Our advice to those who need it, is to live down the past by correct habits, right thinking and diligent work. The telegraph still has need of bright, clearheaded and well-informed men for its present maintenance and future guidance. The pathway to success lies in scrupulous observance of and an eager endeavor to practice all things that make for company prosperity. Company prosperity means individual prosperity. Every reinstated man, putting aside the past, and with earnest resolve, should feel the responsibilities of his position. This is the time for the exercise of sturdy manhood qualities. Conditions in the telegraph service are improving rapidly. Business is being handled even more satisfactorily than before the strike and it is more free from errors, because governed by a better science. The truly generous, appreciative and sympathetic mind will look forward to the time when the late unfortunate troubles will really be buried in a forgiving memory, and a new era in the telegraph be established. Intelligent and high-minded faithfulness to the source that provides employment, is the one thing necessary to hasten the auspicious time.

It should not be forgotten that from the personnel of the telegraph other allied industries are continuously seeking recruits. The accomplished telegrapher stands an excellent chance of winning success in this world.

Mr. E. Boening, assistant superintendent of the Western Union Telegraph Company, Boston, Mass., who recently renewed his subscription to this paper, took occasion to remark: "You may rest assured I will say a good word for Telegraph Age at any time when the opportunity occurs, as I find it a most interesting and educational paper, and one that people in the telegraph business cannot afford to be without." Digitized by Google

Electricity in the United States Weather Bureau.

BY DAY ALLEN WILLEY.

(In the New York Electrical Review.)

One of the elaborate and varied applications of electricity is in connection with the Weather Bureau of the United States. So much of the delicate mechanism employed in making and recording calculations about the weather is actuated by electricity that nearly all of the complicated system is dependent on this energy, although the amount of current used is very small. When it is remembered that over two hundred observation stations are distributed throughout the country and that each is equipped with current-actuated instruments for noting air pressure, wind currents, percentage of moisture, and other data necessary in determining weather conditions, an idea can be gained of the extent to which electrical apparatus is required for this branch of the government service.

It may be needless to say that the daily weather reports published in the newspapers, and spread on bulletins from coast to coast, are obtained from a system of compilation in which the electrically operated devices play an essential part. Of course, the information for this curious "newspaper" published by the government is transmitted entirely by telegraph and telephone, so the sounder and receiver, key and transmitter are parts of the apparatus in every weather station, the wireless as well as the regular line telegraph being extensively used. In fact, the wireless stations at Washington receive as much of the weather news and transmit it to the bureau by telephone or line telegraph. As the majority of the weather bulletins are modeled upon the one issued by the Forecasting Bureau at Washington for that city and vicinity, a brief outline of the manner in which it is published will give a clear conception of the system employed elsewhere.

As fast as the weather statistics are received by the telegraph operators any information of especial interest to Washington is transmitted to one of the staff whose duty it is to edit it for composition. Two men usually are sufficient to do the composing and making up the form, for the latter is merely changed from day to day. The man who makes up the form corrects the map to be printed, placing the marks which indicate the direction of the wind, as well as other signs, upon it. As the preparation of the form begins as soon as the clerk finishes the copy, it is ready for lithographing in a very short time. Meanwhile, in the mechanical department the lithograph stone is being prepared for impression, so that when the form is ready it is reproduced without loss of time. The stone is next placed upon the bed of the press and perhaps in less than an hour after composition began the paper is being run off. The first sheets are carefully examined to note any possible errors which may have occurred. As soon as the sheets are sufficiently dry they are sent out immediately for distribution.

At the Washington bureau is located what might be called the perpetual weather map. From this the telegraph operators get the indications for every part of the United States. As fast as a bulletin is received predicting the weather at a certain place the map-maker indicates it by attaching a button of a certain color to the map. The operators at the keys only need to watch him put in the buttons to wire whether it is to be fair or rain or snow in the locality he has marked. So it might be said that this map is controlled by the electric current, since all the information received for it and given out by it comes and goes by means of key and sounder.

The weather observation station is usually indicated by the mechanism placed upon its roof. It may be in one of the sky-scraper office buildings or in a lower structure, but in either case one sees the familiar skeleton tower to which is attached the weather vane and the anemometer, two of the mechanical reporters which gather information, and sometimes the thermometer box. Another necessary addition is the automatic measure for determining the amount of rainfall or snowfall, while to-day, as a century ago, the barometer is one of the reliable methods of predicting weather, and is indispensable in making forecasts.

The design of weather-vane adopted by the government consists of an iron rod about five-eighths of an inch in diameter and forty-two inches long, the tail of the vane being formed of thin wooden boards spread apart about nine inches at the outer ends. To the other end is attached an arrow point. Despite the weight of metal in the vane it revolves upon a series of three anti-friction rollers, so nicely adjusted that they do not require lubrication, and the amount of oscillation is reduced to a minimum. Connecting it to the recording apparatus is an iron rod usually terminating in a contact box, as it is termed.

The anemometer consists of four hemispheres made of aluminum or brass attached to small square steel arms. Their revolutions turn a spindle which terminates in an endless screw fitting into a series of geared wheels. One of these drives another screw, which, in turn, actuates two dial wheels divided into miles and tenths. The anemometer may be attached to the tower supporting the weather vane by a side arm or mounted above it, as may be convenient. The height of the tower varies according to the surroundings. It is necessary to have the instruments where they are exposed to the direct force of the wind—where its direction is not diverted by buildings or other obstacles.

Not only are the velocity and direction of the wind thus reported, but with the aid of the electric current they are recorded as well. The meteorograph utilized for this purpose is one of the most remarkable instruments in the weather service, for it not only keeps a record of the performances of the weather vane and anemometer, but registers the amount of precipitation or the dura-

tion of sunshine, as the weather is clear or otherwise. For this reason it is sometimes termed a quadruple register, and with good reason. The register contains a drum around which is wrapped a sheet of paper which receives the characters made by the recording pens, which note the changes in all the mechanism. This drum makes one revolution every six hours, being moved by clockwork to insure regularity. After each revolution the drum is moved endwise about half an inch by the action of a screw, thus preventing a record already made from being marked over.

From the meteorograph wires extend to the gearing, which is actuated by the spindle of the anemometer. As the toothed wheels revolve they open and close an electrical circuit, thus operating magnets, which in turn actuate a recording pen. The direction of the wind is recorded by the use of four magnets, which, however, allow eight different directions to be noted if necessary. To the armature of each magnet is attached a long printing arm terminating in a pen point. When a current opens and closes the magnet, the printing point is forced down upon the cylinder, making a dot. The position of the dot on the paper indicates the direction of the wind. The contact box connected with the weather vane contains a series of four cam collars and levers, also four contact springs, one for each point of the compass. When the wind begins to blow directly north the base of the rod extending from the vane to the contact box presses against what is called the "north" spring, which, in turn, touches the corresponding lever, thus sending an electric impulse through the corresponding magnet. When it is blowing northeast, for example, two of the springs are brought into contact with the levers, with the result that two circuits are closed and two magnets will actuate the pens with which they are connected.

An essential part of the mechanism in the station, however, is a combined barometer and barometric recorder, which, by the aid of the current, notes and records the slightest change in atmospheric pressure, so that the observer can tell at a glance this important fact in making his computations. One form of the "barograph," as it is called, consists of a series of corrugated sheet-metal cells placed one upon the other and connected at the upper end of the series to a system of magnifying levers that operate a pen. The pen point rests upon a sheet of paper, which is held on a cylinder having clockwork within it to give it a slow rotation. The varying pressure of the atmosphere causes the cells to contract and expand, and this motion, transmitted through the levers, causes the pen to trace a line on the graduated paper, whose co-ordinates represent the pressure of the atmosphere at any given time.

Another design of the barograph which is also in use, is known as the Marvin, after its inventor. In this form of the barograph the barometer tube is placed at the left of the recording section of the

apparatus, suspended by a hook from what is known as a balance. The weight of the barometer tube upon the horizontal beam with which it is connected at the top is balanced by a rolling carriage and a fixed weight. The equilibrium of this carriage is maintained by a contact spring attached to a balance beam at the extreme right and immediately over the recording cylinder. By the employment of this spring the carriage is moved into the proper position by means of a wheel turned by a horizontal screw. Every time the carriage is set in motion by the disturbance of the equilibrium caused by the movement of the mercury, the spring closes an electric circuit, thus actuating a recording pen which traces a pressure curve upon the paper cylinder. Thus, the rise and fall in the mercurial column is noted. So delicate is the adjustment of this instrument that it is affected by an atmospheric pressure as slight as the ten-thousandth of an inch.

As the thermometer is very essential in calculating temperatures, several designs are employed, and it is a fact that their records are partly preserved by being marked on paper through electrically driven markers. The thermometer is somewhat like the barograph in principle. The element that is affected by the temperature is a metal cell that has the form of a curved and flattened tube, one end of which is secured to the framework and the other end connected by a link to a lever carrying a pen point. It has also a clock-driven cylinder with its graduated sheet of paper. The tube is filled with alcohol, and as the liquid expands it straightens the tube and causes an electric impulse to move the pen over the paper, making an irregular line that represents the change of temperature.

The sunshine recorder is constructed on the principle of the differential thermometer. Inside of a vacuum tube is a tube having a bulb formed on each end, and the inner tube extends into a lower bulb nearly to its bottom. Both bulbs contain air, and the lower one, which is coated with lampblack, has a quantity of mercury in its lower part. The mercury also extends up into the tube. Two wires enter the opposite sides of the inner tube between the bulbs, and these wires form part of the electrical circuit of one of the magnets of the triple register, which magnet occupies a side of the triple register by itself. The armature of the magnet, through a pawl-and-ratchet mechanism, gives the pen lever of this magnet a step-by-step motion, first to one side and then to the other. This action takes place when the sun shining on the heat-absorbing lampblack causes the air and mercury in the lower bulb to expand and force the mercury up the inner tube until it completes the electrical circuit between the curves in the inner tube. Thus the clock breaks the circuit for an instant every minute. When it is cloudy the pen simply traces a straight line.

The recording rain gauge consists of a cylindrical casing supporting an open funnel above and a reservoir below. Beneath the mouth of the

funnel is a pivoted tray or "bucket" divided into two compartments under the funnel mouth. When this is filled with rain water the water is emptied into the reservoir and the empty compartment brought under the mouth of the funnel. This tipping of the bucket momentarily closes an electrical circuit, including the sunshine-recording magnet of the triple register, and causes the pen to follow a motion in general like the sunshine record, but so irregular is it, having either more or less stops in a given time, according to the rapidity of the rainfall, that it is easily distinguished from the sunshine record.

Another interesting form of mechanism in connection with the work of the forecasting bureau is the recorder attached to the weather kite. To the kite is fastened a small anemometer, which is connected by wiring to the little electrical recorder which is enclosed in an aluminum case. It is modeled on the same principle as the quadruple register already described, but is only intended to note the direction and velocity of the wind, so that it is provided with but two pens for this purpose. With the kite instruments many valuable data have been obtained at heights several thousand feet from the surface.

Improving Way Room Facilities.

BY W. J. ROSS, NIGHT CHIEF OPERATOR,
MEMPHIS, TENN.

I never visit even our most modern and up-to-date large telegraph offices that I am not surprised at the meagre facilities and old-time equipment of the way room. And it is with a view of possible benefit to the service that I venture the following suggestions.

I am a believer in spring-jacks and combinations in the way room. I do not mean by this that I am in favor of combinations as I have seen them—of twelve to sixteen wires on one table where business is slaughtered in a foolish effort at economy by trying to make one man handle the entire traffic of the twelve or sixteen circuits. Such action always results in serious and frequent delays and is, I believe, responsible for the bad repute into which this method of "facilitating" traffic has fallen.

We will take for an illustration one side of a series of way room tables carrying eight circuits—four on each side. I would first double-deck the tables and place enough hooks on each circuit so that no two messages for different points need be hung on the same hook. Next, above each circuit, on the upper deck, I would place spring-jacks to which are connected not only the wires on that side of the table, but also the "run-in" railroad wires for the respective offices in that circuit. Thus an operator instead of being compelled to pick up his typewriter, and walk eight or ten feet, could bring to his table any wire in the series either to receive or send from. In addition to this, when necessary to run an office in on the way wire from the corresponding rail-

road wire, as is the case with at least a third of our messages, the operator, instead of referring the message to his traffic chief and thence often to the wire chief for a "run-in," can, himself by a simple change of wedges, cut in on the railroad wire, get his man, run him to way wire, and send the message before the traffic chief could have gotten to the Irish quad, or other antiquated piece of machinery that may serve a like purpose.

The lists of offices in way rooms as a rule are also very abortive affairs. I believe that all the information necessary for the operation of that particular circuit should be shown on the call sheet. This should include points for which offices relay, places that "loop" on, the office calls, time of closing, and railroad wires that are in the different way offices.

I believe an adoption of a system similar to this, arranged to meet the needs of an office, would increase the efficiency of the operating force at least twenty per cent, and very frequently permit a reduction of the force, especially at night and Sunday when the work is light and scattered; and it would certainly relieve the traffic chief of a great deal of work and responsibility in the matter of running delinquents in from railroad wires.

I must confess that the suggestions offered are largely theoretical, as I have not seen them fully tested, but as it is chiefly through theorizing that we achieve advancement, I would like to see the suggestion put into practice and know the result.

Why not open a department in *Telegraph Age* "For the benefit of the service," where the "feeble-minded" brethren can air their views upon this and kindred topics?

Rev. F. L. Odenbach, S. J., director of the Meteorological Observatory of St. Ignatius College, Cleveland, has invented a method of telephoning to moving trains. The invention also provides a telephone system between moving-train units, and between moving and stationary points and between stationary points upon railroads. It is intended to accomplish such signaling and telephoning only within certain predetermined limits. Further objects are to provide means upon moving railway units, enabling the operator of each unit to determine whether the other is behind or before him, and at what speed such other unit is moving; to apprise the operator of a moving car or train of an open switch or signal of danger ahead of him; and to adapt these means to a block system, or local system, wherever such system is desired. The *Western Electrician* describes the system in detail.

Mr. N. E. Smith, of New Haven, Conn., superintendent of telegraph of the New York, New Haven and Hartford Railroad Company, in a recent letter, took occasion to say: "I derive much pleasure in reading *Telegraph Age*, and should feel that something is missing should it fail to arrive promptly."

The Mysterious "Wire."

When the messenger delivered the mysterious telegram at the office of the superintendent of the coal-service of the Union Pacific Railroad there was consternation. Mr. Clark had been spending sleepless nights endeavoring to keep everybody good natured along the three thousand miles of railroad.

Coal was very scarce; engine coal was being confiscated daily by desperate citizens of the small towns, but the worst thing to fear was the coming elections and possible radical legislation. Then came this message:

336 N. P. U. B. N.

Cheyenne, Wyo., Sept. 16, 1906.

D. O. Clark, Omaha, Neb.

If something is not done at once to relieve the fuel situation here I will take measures to find out why. You evidently forget that there is a legislature to be elected in a few weeks. Legislation may bring you to your senses.

R. M. Smith, 3.45 P. M.

Mr. R. M. Smith was not known to Mr. Clark. The records of the office were scrutinized, but they revealed nothing. Then the telegram was taken to the telegraph office with a request that the Cheyenne office enlighten Mr. Clark as to the identity of the sender of the message.

Messengers were sent about town by the manager of the Cheyenne office to make inquiries, but R. M. Smith could not be located. The Omaha office demanded that the files of the Cheyenne office be searched for the original telegram filed there. That was done, but the original of the message was not discovered.

Mystery!

Next, the superintendent of telegraph took a hand in the affair, proceeding to "jack up" the manager of the Cheyenne office for carelessness and poor management in allowing a telegram to become lost from the files. Trying to make good, the manager kept messengers scouring the town in search of "R. M. Smith."

No such man was located, and no light could be shed on the origin of the strange message.

Mr. Clark grew impatient and then angry. He had the telegram; it came from somewhere; so he put it up to the telegraph department to say what about it.

The Cheyenne office was turned upside down. There was no getting away from the affair without some explanation. It was a case of find Smith or find the original message.

Finally, sales agent A. H. Doane, of the general offices, was sent all the way to Cheyenne—a distance of five hundred and sixteen miles—to investigate. After spending a whole day in probing, Mr. Doane returned to Omaha with the information that he had scoured the city of Cheyenne from end to end without finding a trace of "R. M. Smith," and that he had gone through the Cheyenne office with a fine-tooth comb without discovering the slightest trace of the message.

Just then it dawned upon the mind of some one at Omaha to find out what operators sent and

received the telegram. The service at the top indicated that the message was number 336; that it was sent by operator "P. U."; that it was received by operator "B. N."

Who was "P. U."? Who was "B. N."? It was simple enough to find out, and operator "P. U." at Cheyenne was questioned, but he could not recall whether he had ever sent such a message or not.

Operator "B. N." was Ben. Sprague, who became deathly pale when he was confronted with the telegram. Shamefacedly, he acknowledged that the message had never been transmitted over the wire; that nobody connected with the Cheyenne office had ever seen it; that "R. M. Smith" was a myth.

When he could get the lumps out of his throat, he followed the manager of the telegraph office up-stairs to the office of Superintendent Clark to offer whatever explanation he had to make.

And this was the solution of the great mystery:

Sprague had bought a new typewriter. He had his own ideas as to what style of type was best suited for the work of the office; so, when ordering the machine, he had requested that it be fitted with a small, neat letter, different from anything in use there.

Proudly, he showed his new machine about the office. It was admired by every one. By way of trying the type, he wrote several messages on telegraph-blanks, all of which were out of whole cloth—imaginative messages of his own making.

As these alleged messages were written, one after another, they were taken from the machine and torn up. It happened, however, that the time for Sprague to be relieved came in the midst of his practise.

Taking the typewriter from the table where he had been working, he set it in a window, picked up his hat and went home. Later his "relief" noticed that there seemed to be a message still in the carriage of the machine and removed it. The telegram looked all right.

The operator who found it—more than an hour after its apparent receipt—thinking that he was doing Sprague a great favor, hustled it up-stairs to the office of the coal department, and the mystery was born.

Sprague, in his haste to leave the office, had failed to remove the last of the "fakes" which he had written. This was the one which caused the mischief. It was one of the queerest telegraphic "bulls" that ever occurred in the history of the service.

Sprague expected nothing less than dismissal, but he got off with a severe reprimand, after which the fake message was carried about the telegraph-office, shown to each of the twenty operators, with an explanation of how it happened, what it did, and a general warning never to let such a thing happen again.

All of which goes to show how easily a telegraph operator can "do things." Ross B. Franklin, in the *Railroad Man's Magazine*.

International Congress on Electrical Units and Standards.

The general object of the International Congress on Electrical Units and Standards, which is to meet on the invitation of His Majesty's government in London in October, is to consider and advise as to the steps which should be taken to bring about agreement in the definition of electrical units which form the basis of legislation in different countries, and in the methods of constructing and employing the electrical standards necessary to give effect to these definitions.

It is hoped that the delegates to the Congress may find themselves able to embody their conclusions in draft articles which might be commended to the several governments represented as a basis for uniform legislation and administration in relation to electrical units and standards.

The fundamental units of electrical measurement are the ohm, the ampere and the volt. Of these two are primary units, being independent, and the other secondary or derived. It is generally agreed that the ohm should be accepted as one of the primary units. There is some difference of opinion as to whether the ampere or volt should be the second. This point will be one for the conference to consider.

Again, the ohm is realized by means of the resistance of a column of mercury of definite dimensions, the ampere by means of the electrolytic deposition of silver, and the volt by aid of a standard cell.

If this method of realizing the units be accepted by the congress, specifications for the ohm and ampere will call for consideration, while the standard cell must be selected and the method of setting it up prescribed.

In view of the scientific questions raised in connection with each of these matters, including also the choice of the two primary units, it will be suggested at an early meeting of the congress, should such a course appear to be desirable, that the congress should appoint a small technical commission of experts to discuss the questions and report thereon to the congress. The congress will also be asked to consider the best methods of securing uniformity of administration in the future, and for arriving at a decision on any questions left undecided at the close of the congress.

It is desirable to have some definite questions before the congress, and with this object the following propositions embodying conclusions arrived at by the representatives of the various National Standardizing Laboratories which met at the Reichsanstalt in 1906, and which are also generally in accordance with the decisions of the Chicago congress held in 1893, will be brought forward as a basis for discussion:

First, that the ohm shall be the first primary unit; second, that the ampere shall be the second primary unit; third, that in consequence the volt shall be treated as a secondary or derived unit;

fourth, that the international ohm be defined as the resistance at the temperature of melting ice of a column of mercury of uniform cross-section terminated by planes at right angles to its length 106.3 cm. in length and 14.4521 grammes in mass; fifth, that the international ampere be defined as the unvarying electrical current which, when passed through a solution of nitrate of silver in water, deposits silver at the rate of 0.001118 gramme per second; sixth, that the international volt be defined as that E.M.F. which, when applied steadily between the ends of a conductor of resistance 1 international ohm produces a current of 1 international ampere; seventh, that the Weston cadmium cell be adopted as a convenient standard of E.M.F., having at a temperature of 17°C. an E.M.F. of international volts, but that it is undesirable that the number representing the E.M.F. of this cell should be the subject of legislation in any country; eighth, that specifications dealing with the methods of setting up mercury standards of resistance, of realizing the ampere by the deposition of silver, and of preparing standard cells be issued with the authority of the congress, and that for this purpose a technical commission be appointed to prepare these specifications, and ninth, that the congress consider and advise as to the best method of securing uniformity with regard to the fundamental electrical standards for the future.

Interference of Transmission Lines.

Perhaps one of the most important cases of interference between two electric companies, is being heard in Chicago, in connection with the application of the American Telephone and Telegraph Company for a permanent injunction restraining the Illinois Traction Company from making alive the high-pressure 33,000-volt power transmission wires, which have been erected immediately above the main lines and parallel with the wires of the American Telephone and Telegraph Company through the town of Lincoln, Ill., and in the main street of the town, Chicago street. The case is exciting great interest owing to the fact that the decision will affect such construction at numerous other points throughout the state of Illinois. The result of the case means a great deal to both parties; a better idea can be obtained of the interest taken in this case from the fact that the telephone company's side introduced testimony in its behalf from twenty to thirty of the prominent engineers on this continent.

Mr. P. W. Drew, superintendent of telegraph of the Wisconsin Central Railway, and many years the secretary and treasurer of the Association of Railway Telegraph Superintendents, in renewing his subscription the other day for another year, took occasion to write: "I congratulate you on the successful way you have made Telegraph Age a necessity. We can't do without it in our business. I enjoy every number."

Work of the Signal Service in Alaska.

General James Allen, the chief signal officer of the United States army, has under him 1,250 men. Of these 210 officers and men are in Alaska. They have now completed nearly 10,000 miles of cable, wire and wireless system, serving fifty places where in a year 200,000 messages have been received, many sent from the far Eastern States.

So difficult is this work in the wilderness that no individual or company has tried to establish a telegraph system, and therefore the government does all the communicating between the Territory and the rest of the country, whether by mail or by wire. But such work is easy contrasted with running a line across the tundra.

This treeless, bottomless, vegetable sponge is capable of sustaining heavy weight only when winter has turned to ice the water contained in it. Even in winter the telegraph poles sometimes break through the frozen crust and half a day may be needed to dig one out of the ooze, if indeed it is not down so deep that efforts to recover it are useless. To set a pole in the tundra is difficult because it must be forced down many feet to reach a firm foundation. Yet for hundreds of miles the telegraph men of the Signal Corps have often found it necessary to hew a lane through miles of forest in order to make a highway of the tundra in their operations.

While the sheets of ice into which Nature turns the Alaskan rivers in winter permitted the service to use these streams for pack trains in hauling equipment for stations and lines, the workmen were continually menaced by the storms which sweep down the valleys. The Alaskan storm is a blizzard in violence. Usually the snow falls in a sandlike powder that is driven in masses, and in an hour may drift to the height of a man. With the mercury a score of degrees below zero human life cannot exist exposed to one of these blizzards. There have been times when a line squad have been kept prisoners for a week or more in the clump of trees where they have sought refuge to save themselves from such a storm.

The sight of a glacier spanned by telegraph poles can be seen out in the Tanana country. In a number of places it has been necessary for the Signal Service men to turn into mountaineers to accomplish their purpose, for the lowest pass in a range may be a thousand feet above the line of perpetual snow. This means hard work and plenty of it. No poles can be cut on the ground, because no forests are at this altitude; so the poles must be hauled from the valley below up the slopes with ropes carried on the shoulders. The site for the pole may be an ice covered rock in which a hole must be blasted. As the movement of the glaciers is very slight, the lines can be built as durably as on the solid earth.

One of the largest sections of the military telegraph in Alaska is along the Mississippi of the Territory—the Yukon. As this stream rises rapidly when in flood, one of the most difficult tasks of the service is to keep the line in repair. As it

is, long stretches are frequently carried away by freshets. Such an accident happened in the spring of 1907. A rapid rise in the Yukon broke the thick ice into cakes and sent them swirling seaward, carrying away trees and shrubbery and crumbling away the river bank. Over one hundred miles of telegraph was destroyed by the ice projectiles, which broke off the poles like so many splinters of wood or tore them out of the earth.

The communication by wireless telegraphy in the Territory has been very successful. The messages are sent with apparatus, much of which has been designed by experts in the service. Messages sent over one hundred and nine miles have been received clearly and distinctly. For this reason it is intended to enlarge the wireless system and avoid the arduous work in setting poles and stretching wire.

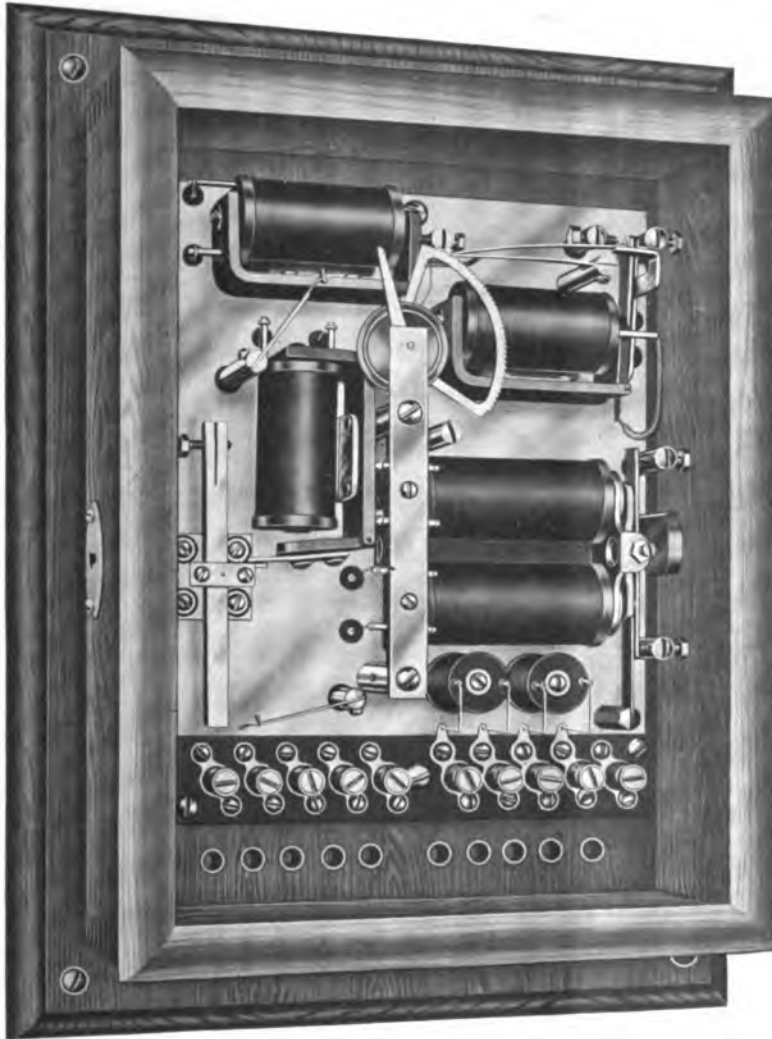
Plans have been made for wireless installations with a view to furnishing a complete chain of wireless stations from Safety Harbor to the main land of the United States. In entering upon this plan the army has co-operated with the projected plans of the navy. Money has been appropriated for the construction of a station at Fort Gibbon to connect the existing wireless stations at Safety and St. Michael with the proposed naval station at Valdez and thence via the proposed station at Sitka to Tatoosh Island, off the entrance of Puget Sound, and to San Francisco. This will ultimately give a complete chain of wireless stations supplementing the present land line and cable system from Norton Sound to the United States.

To supplement this system and to reach other points in eastern Alaska the Signal Corps has now in process of installation two wireless stations, one at Fairbanks and one at Circle City. These stations are about one hundred and forty miles apart and are designed to have a radius of action of about two hundred and fifty miles. The instrumental equipment has been purchased and built, the electric power being derived from a gasoline engine. The antennae, or wires, are to be suspended by the use of steel towers one hundred and seventy-five feet in height. The establishment of these permanent stations should enable communication to be maintained if desired with boats on the Yukon River as well as with smaller outlying stations and camps by using portable field sets.

Mr. George M. Dugan, of Tip Top, Ky., formerly superintendent of telegraph of the Illinois Central Railroad Company, recently in renewing his subscription for the twentieth consecutive year, took occasion to write: "I take pleasure in enclosing my check for the usual amount for the continuance of my subscription to your valuable paper. It is one which every man, woman and child connected with the telegraph and telephone service should read. For the moderate price at which it is furnished the paper should be within the reach of all." Digitized by Google

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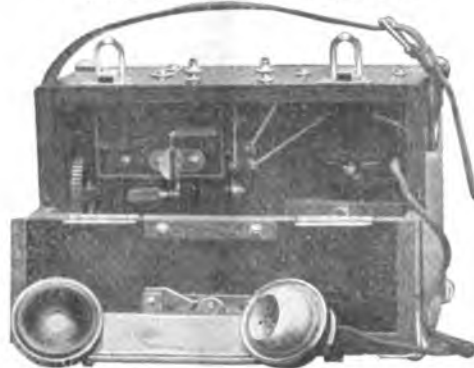


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The Railroad.

The Pennsylvania and the Lehigh Valley Railroad companies have filed a bill in equity in the United States Circuit Court, seeking an injunction to restrain the Interstate Commerce Commission from taking any further proceedings in pursuance of its order of March 3 last to enforce the nine-hour law for railroad employes.

A patent, No. 892,203, for a signaling system for railroads, has been awarded to Max W. Zabel, Chicago. Railroad signaling system having means whereby any block in a despatcher's division may receive a selective signal to the exclusion of all other blocks, and whereby a positive indication is given to the despatcher that the selective signal is received.

The few words spoken by Mrs. W. F. Williams in behalf of the lady guests present at Montreal at the time of the convention of the railroad telegraph superintendents, in presenting the silver card receiver to Mrs. W. J. Camp, chairman of the ladies' committee, in recognition of her many and gracious attentions to the visitors during their stay in the Canadian city, has since been frequently referred to as a most felicitous expression, marked by fine address and generous appreciation.

Mr. P. W. Drew, of Chicago, secretary of the Association of Railway Telegraph Superintendents, and superintendent of the Wisconsin Central Railway, in a recent letter makes the statement that train despatching by telephone is a very live issue in the West. Mr. Drew's report receives confirmation in all parts of the country, for train despatching by telephone is evidently a live issue everywhere. We believe, however, that many of the superintendents of railway telegraph are making a great mistake when they attempt to utilize old telegraph circuits for telephonic purposes. The telephone equipment should properly be of up-to-date apparatus; the selectors used should be of the best. Makeshifts in these particulars will not permanently meet the requirements of busy railroads and their adoption will only lead to trouble. If the equipment is first class in every particular the results reached cannot be other than satisfactory. If the equipment is of the makeshift type the service rendered will be of the same character.

The Delaware, Lackawanna and Western Railroad Company, L. B. Foley, superintendent of telegraph, began the operation of its trains by telephone on the main line between Scranton, Pa., and Binghamton, N. Y., on Sunday, July 26, using the Gill selector system. The operation of trains on the division extending from Scranton to Washington, N. J., will also soon be conducted by telephone, the Burlington system being used. As soon as the necessary telephone wires are constructed on the division extending from Binghamton to Buffalo, a distance of 203 miles, trains will be despatched by telephone instead of by telegraph as now. The branches extending from Binghamton to Syracuse and Os-

wego will also be operated by telephone as soon as the necessary equipment can be installed, which will be by October 1. The division from Washington to Hoboken, N. J., will not receive a telephone equipment until present unusual road complications can be met and overcome. The company will adopt as their standard the selector that after trial shall be deemed best to meet requirements.

The joint committee of the American Railway Association on interlocking and block signals, which is made up of the committees on train rules and safety appliances respectively, with F. C. Rice, of the Burlington, as chairman, were taken by Mr. Rice on July 17, following a meeting in Chicago on the 16th inst., to inspect the Burlington's system of train despatching by telephone, and the safety stop device installed on that line for trial at the request of the Interstate Commerce Commission. The party was taken to Aurora, thirty miles from Chicago, by special train, where special facilities had been provided for the train despatching demonstrations. (A report on this system read by W. W. Ryder, superintendent of telegraph of the Burlington, before the Association of Railway Telegraph Superintendents at Montreal, Que., June 24, has already appeared in *Telegraph Age*). The installation of this system on the Burlington is due primarily to the initiative of Daniel Willard, second vice-president, and Mr. Ryder has attended to the details. In the demonstration for the American Railway Association committee, each person was provided with a receiver enabling all to "listen in" simultaneously as the orders were handled. The statements made in Mr. Ryder's paper regarding speed of handling, distinctness, etc., were well borne out, the opinions of the visiting officers being unanimous upon this point.—*Railroad Age Gazette*.

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

Telegraph Age is the leading journal of its class in the world, and should be in the hands of every progressive operator; \$1.50 a year.

Dry Battery.*

BY U. J. FRY, OF MILWAUKEE:

Superintendent of Telegraph of the Chicago, Milwaukee and St. Paul Railway Company.

We beg to report to you the final results of our experiment with dry battery block wire service between Brookfield and Waukesha, Wis., referred to in our note of last year, to the effect that the thirty-two cells used, failed after three years' service, and means an expense of \$5.12 as against \$102, first cost and maintenance for three years of 32 cells gravity battery.

As applied to the service on a railway operating 2,000 miles of block signal service and using our present form of block wire, we estimate the 4,000 cells of gravity battery necessary, first cost and maintenance, for three years at \$14,000, while double the number of dry cells (8,000) will cost \$1,280, or a difference of \$12,720; \$4,360 per year, or \$2.18 per mile of road per year.

While constructing a telegraph line along our Coast Extension Railway we found it impossible to prearrange for gravity battery service and are using dry battery temporarily by connecting up a sufficient amount to operate a wire one hundred, or one hundred and fifty miles in length, inserting a sufficient amount of resistance to bring the current down to about fifty milliamperes while the circuit is short. When more wire is added we cut out resistance from time to time to equal the wire resistance added, maintaining as near as we can fifty milliamperes current.

It can readily be appreciated that by using a large number of cells, and inserting resistance, the discharge from each cell will be exceedingly low, the expense small and the convenience afforded us in that we can carry the battery with the construction outfit until needed, when we can set it up in almost any place and pay no further attention to it except to cut out resistance occasionally. We used a set of dry battery in this way for six months, when it failed, at which time we had arranged for gravity battery service.

While it is not possible at all times to find a safe place for gravity battery to operate local sounders we found it very convenient to use fifty ohm sounders and keys only until we can construct station houses and arrange for standard instruments.

In these concluding lines on dry battery we find we have been unable to furnish as much information as we should like to have done, and in lieu of what we did not say, and assuming you will permit, we thought perhaps a few of our shop notes might serve to interest some of the younger men in the service, and I submit the following:

To determine the number cells of gravity battery necessary to furnish approximately thirty milliamperes current for one, two, three, four or

five wires, when the resistance of each is about equal, select one of average resistance, add the relay resistance, multiply by constant given herewith, and opposite the number of wires under consideration. The amount shown will represent the total number of cells required, which should be divided and half the number placed at each end of the circuits.

Number of Wires.	Current Milliamperes.	Constant.
1	30	.032
2	32	.034
3	34	.0365
4	36	.039
5	38	.0415
1	45	.049
1	50	.055
1	55	.061
1	60	.066
1	65	.071

While it is not theoretically correct this formula will be found sufficiently so for ordinary cases.

It is understood that when using gravity battery the current will be reduced about two milliamperes for each wire added on account of the internal resistance in the battery, while with dynamo current the drop, if any, will not be noticeable.

In each of the cases shown, when all wires are closed, each will receive approximately thirty milliamperes. If one should be opened the current in each remaining closed will rise about two milliamperes, etc. Should three be opened, the current in those closed would rise six milliamperes.

Not more than four wires should be fed from the same source, because the variation during damp weather, when it is necessary to adjust high, becomes so great and margin small the wires will not work well. Five wires would cause a variation of ten milliamperes, and you can appreciate what this means under such conditions.

When inspecting our main line battery, or for testing one or more cells of dry or gravity battery, we find it convenient to have a small compass with us. One that costs twenty-five cents will answer the purpose, and by making a few tests with battery we know to be bad with one we know is in good condition we can form some idea as to what reading we should have and decide accordingly.

Place your compass conveniently near the one or more cells, bring a wire from one pole of the battery to the compass, place it on the compass immediately over and parallel with the needle, hold it firmly with one finger, and when the needle is quiet complete the circuit with a wire from the other pole and note the deflection of the needle.

While you, no doubt, are familiar with these matters, we thought perhaps some of your men may have forgotten, and it is for such we respectfully submit these items.

* A paper read at the convention of the Association of Railway Telegraph Superintendents at Montreal, Que., June 24-26, 1908.

Qualifying Operators for Train Despatching*.

BY C. S. RHOADS, OF INDIANAPOLIS.

Superintendent of Telegraph of the "Big Four Route."

When we consider that about ninety per cent. of young men make failures of their chosen vocation it is easy to see that only the fact of the individual being the sole sufferer thereby is all that prevents this startling condition from causing serious disorder in our complex business fabric. Few relatively, of course, of this ninety per cent. are train despatchers. Just consider for a moment, however, what failure in this profession means; any one of numberless oversights or careless risks and mistakes may distribute suffering to dozens and even hundreds of people who may never know even the name of the man whose failure at this chosen profession has involved them.

If qualifying an operator for the important position of train despatcher consisted merely in acquainting him with the standard code, our task would be a comparatively easy one, but the work of the train despatcher exceeds that. To be successful in the true sense of the word, the aspirant must be an extremely resourceful individual, with many and varied attributes that go to make safe service. Some one has said that "Wisdom is knowing what to do next, and skill is knowing how to do it." So our first duty in looking for material is to find the fellow who at least has the first of these attributes; that is, one who is not satisfied with what he is doing as an operator merely, but is ambitious for promotion—in this instance to become a train despatcher, and who is wise enough to take advantage of every circumstance offering that tends to fit him for his calling. Our next duty should direct us to aid him in becoming skilful in his occupation. He should be able to send good Morse and likewise to receive the same, good and bad and indifferent, as it comes; and as a further up-to-date qualification he should cultivate a telephone voice, for the despatcher of the future will no doubt 'phone his orders; hence, clear pronunciation, minus stammering, will be a necessary requisite. He should first acquire proper experience at a way station, becoming familiar with all the little details of station work. This includes not only that devolving upon the agent and operator, but also that of the trainmen. When he has earned promotion to the despatcher's office he will enter upon his higher duties possessed with a knowledge gained by diligence and observation which gives him an advantage over the man who has not had the benefit of the station training. It is obvious that the more training he has in this direction the sooner he will be qualified for further advancement to the position of despatcher itself. The time of probation in that department, in addition to his natural ability

for the work, depends largely on the opportunity he has to observe and familiarize himself with the despatcher's work. Preferably he should act as copier for a despatcher; in that capacity he not only has the better chance to become qualified, but the despatcher has an opportunity to try him out, and if the despatcher himself, is properly qualified as a teacher, he will soon be able to pass judgment as to the applicant's adaptability and fitness for promotion. With the advent of shorter working hours the operator, if he is wise, and aspires to a larger usefulness, can find time to devote some spare hours each day in keeping up the train sheet for the despatcher, and in going out on the road, and so becoming familiar with the trials and tribulations of the trainmen and in learning the location of every switch and siding. In no part of the service is a complete knowledge of detail more important than in this.

When we come to enumerate the items that constitute all the elements that stand for success in train despatching, possible candidates are apt to be frightened by the apparent multiplicity of duties required to meet the demands of the position. But it is just this underlying fact that every applicant should understand in the beginning, and it is our duty to see that they have the idea thoroughly instilled into them that "a little knowledge is a dangerous thing" in connection with despatcher's work. In examining operators for promotion a full and complete knowledge of every factor of safety, including what might be termed only "precautionary" items, should be required of the candidate. While some may argue that a person is not at his best until after he has made a few mistakes, we must urge that the work of the despatcher does not permit of this exception. Certainly no operator should be approved for promotion whose record does not imply that "in all cases of doubt or uncertainty he will take the safe course and run no risks."

The age limit having been reached by the telegraph superintendent at Dublin recently, his consequent retirement from the service was referred to by a local telegraph journal in the following paragraph, characteristically Irish, at least in expressive mention, but which cannot be said to bear striking evidence of regard for the man and poignant grief at his going; it will stand unique as a farewell send-off:

It can scarcely be said that any real progress has been made during his tenure of office. He was undoubtedly a man who was inclined to shirk responsibility on any important question, and could be described only as an adept in the game of shuffle, devoid of virtues or vices, in official matters.

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

* A paper read at the convention of the Association of Railway Telegraph Superintendents at Montreal, Que., June 24-26, 1908.

The Military Telegrapher in the Civil War.

PART SIX.

William A. Sheldon, a military telegrapher during the Civil War, and for many years past a resident of New York, had an active army career both in the East and West, or, more properly speaking, Southwest. During the major part of the war he was attached to the Department of the Gulf as chief operator, and held the position of manager at New Orleans. He had previously been a cavalry officer in the Army of the Potomac, from which he derived an experience that afterwards in his operations in connection with the telegraph in the Southwest, proved to be of much value to him. In a letter to Colonel William R. Plum, the historian of the military telegraphers, dated back in the seventies, Mr. Sheldon writes most entertainingly of some of his exploits in that particular field. In part he says:

"The value of the telegraph as an auxiliary aid to the army, during the Civil War, is well known in the North, where daily communication was had, with all the different department commanders throughout the North and West. The Department of the Gulf, however, under the command of Generals Benjamin F. Butler and N. P. Banks, being completely isolated from any of the others, and difficult of reach, the quickest communication therewith being by steamer, very little has been made public of the telegraph in connection with that field of operation.

"Shortly after the departure of General Banks to take command of that department I was sent out by General Anson Stager to report to Captain Bulkley, A. Q. M., at New Orleans, for duty. We reached Quarantine, the station below the city, on May 1, 1863. Here our steamer was stopped under the stringent laws governing quarantine. We had a load of government stores on board, besides having a schooner in tow loaded with siege guns and ammunition. The officer in charge was anxious to reach New Orleans as quickly as possible and a message was sent across the river to the telegraph station, giving notice of our arrival and asking New Orleans headquarters for orders to come up to the city. After waiting nearly all day and receiving no reply, I applied to the captain and doctor requesting to be sent over to the office to see if matters could not be hastened. This I was allowed to do, and here for the first time I became acquainted with the demoralizing effects caused by the assumption of authority by officers of the army, some favorite of the commanding general being placed in charge of the telegraph. In this instance General T. W. Sherman, at that time military commander at New Orleans, had in the absence of General Banks, who had started on his first Red River campaign, taking Captain Bulkley with him, temporarily, had thought best to place one of his officers in charge of the telegraph department. The two operators in New Orleans rebelled at this, and being threatened with imprisonment, tendered their resignations,

notifying Captain Bulkley of what had been done. It was because of this state of affairs, no operators being on duty, that caused our delay at Quarantine. Through a message which I personally sent to the operator stationed at Algiers, on the opposite side of the river from New Orleans, explaining the circumstances of our detention and whose good offices I obtained in the matter, an order was shortly secured permitting us to pass up the river. New Orleans was reached early the next morning and an interview was had with Captain Bulkley, who had been hurriedly summoned to return in order to adjust matters involved in the resignation of the discontented operators. I presented my letter from General Stager, was cordially received, and placed at once in charge of the office as well as made chief operator of the department.

Shortly after my reaching New Orleans the command of our army forces passed from General Sherman to General W. H. Emory, who seemed to have a clearer conception of the duties and responsibilities attaching to the telegraph, and as a result my position became a very pleasant one.

The telegraph lines under my charge consisted of a single wire extending down the river to South West Pass. It had only three offices in the one hundred and ten miles of its length, namely, Quarantine, Fort Jackson and South West Pass, with a test station at the head of the passes. That part below Quarantine extended wholly along the edge of the river and was accessible to the repairer by boat only. Then there was the line across Berwick Bay, via the New Orleans, Opelousas and Great Western Railroad. A line was kept working as far as New Iberia, until General Banks cut loose and struck across to Alexandria when the part west of Berwick Bay was abandoned. On the railroad line we had only three offices, one at Algiers on the opposite side of the Mississippi from New Orleans, another at Bayou Lafourche and one at Brashier City on Berwick Bay. On the Northern Railroad we had but one post, Pass Manchac. A line also extended to the Rigolets, or entrance to Lake Ponchartrain, but was not used during my stay in New Orleans because we lacked operators.

The up-river line to Baton Rouge, one hundred and thirty miles in length (from which point the line was put in order to Port Hudson during its siege and communication established, between the different division commanders) had offices at Port Hudson, Baton Rouge, Donaldsonville and Bonne Carre.

To ensure protection to the line a patrol of cavalry was constantly on guard. Late in the afternoon one day during the siege at Port Hudson the line suddenly went down. Bonne Carre was the only office that could be raised. Early the next morning Bonne Carre called and sent a message from the officer in command of the patrol saying that two hundred guerillas were reported just below Donaldsonville and had torn down the telegraph wire, and permission was asked to with-

draw his force inside the works at Bonne Carre. To this General Emory replied that if he was fully satisfied the report was correct the withdrawal might be made. Several hours later the report came that the command was safe within the works at Bonne Carre. For nearly two years I had been in the cavalry service, mostly in the Army of the Potomac. Now, a man learns a good deal in that particular branch of army work, and from certain features of the report that reached us respecting the guerilla story, I had my suspicions aroused that the facts of the case were not exactly in accordance with those we were asked to believe. I so expressed myself to General Emory. It was necessary to restore communication with General Banks at Port Hudson. I sought and obtained an order from General Emory to proceed to Bonne Carre by steamer, to use the cavalry stationed at that point, ascertain fully the cause of the break in the line, and if possible to restore the same. With this end in view I started on my mission up the river by steamer, taking with me a line repairer, a supply of wire and necessary tools. Reaching Bonne Carre, the captain in command of the cavalry, the same who was responsible for the guerilla story, in obedience to instructions, tendered me a cavalry guard to escort me to Donaldsonville, forty miles beyond, excusing himself, however, from accompanying the troop on the plea of a lame foot, and turning the command over to a junior officer. The situation was not without its element of humor, especially when the doughty captain offered to follow the cavalcade up the river on a gunboat, from which, in case of necessity, he might land and take active command. It is hardly necessary to add that he remained behind.

Our march was not without adventure, but nothing serious occurred. About two miles below Donaldsonville the wire trouble was located. About a quarter of a mile of wire had been cut out and the missing portion was nowhere to be found. Scouting through the neighborhood an old negro was come across who declared that an overseer of a near by plantation had cut the wire and thrown it into the river. The recalcitrant overseer was finally secured and sent to New Orleans. The break was, of course, soon repaired, and communication once more established between New Orleans and Port Hudson, a fitting celebration of the day, for it was on July 4, 1863.

Our return to New Orleans was accomplished on board the North America, formerly a passenger steamer on the Hudson, plying between New York and Albany.

When Port Hudson surrendered, the papers, etc., found in the commanding general's quarters were brought to New Orleans. I was enabled to select from among the budget of telegrams all that had any bearing on the famous raid of Colonel Grierson. These were mostly despatches from General Pemberton to General Gardner, notifying him of Grierson's start and daily progress as far as they could ascertain, with details of plans to

intercept him and stop his career, all of which were unsuccessful.

The winding up of the file after Grierson's arrival at Baton Rouge was a despatch from Gardner to Pemberton, saying: "Grierson has arrived at Baton Rouge. How did he get through?" To which Pemberton very tersely replied: "I don't know. Do you?"

This correspondence was put in shape and sent to General Grierson, who sent me the following letter of thanks:

Headquarters, Cavalry Division,
16th Army Corps.

Memphis, August 17, 1863.

W. A. Sheldon,

Ci. Teleg'h Opr.,

New Orleans, La.

Sir:—Yours of July 16 enclosing telegraphic despatches captured at Port Hudson has been received. Please accept my thanks for your kind consideration; they are, of course, highly interesting to me.

Resply,

Your obt. servt.,

B. H. GRIERSON, Brig. Gen'l.

It was during the siege of Port Hudson and at the time an attack was made at Fort Butler, Brasher City and other points, and after two days and nights of continuous service, that I was awakened one night shortly after having turned in at midnight, wearied out after the long, sleepless vigil by heavy knocking at the door, accompanied by gruff orders to get up and send a message at once. These orders came from two aides of General Emory (who was commanding the city at that time), young gentlemen who doubtless supposed all that was necessary to do was to order the thing done and not how it was to be done. The point desired to be reached had no operator in attendance. No explanation could convince these young officers that it was necessary to have some one at the other end of the line to receive the message. They wanted it sent, and insisted upon it being done.

Some loud and hard talk followed, arrests threatened on the part of the officers, etc., and as the office adjoined my sleeping apartment I was for a time made prisoner with a sentry posted in the hallway.

When the facts came to the knowledge of General Emory later the same morning, the officers were made to realize the mistake they had made, and I believe the ears of those young fellows would tingle even now as they recall this interview with their commanding officer.

The Department of the Gulf was always short of operators. At no office was there ever more than one except at New Orleans, where Henry Stouder was for some months the only assistant I had. Finally another, a Mr. Fairchild, came out from New York, and he helped lessen the duty of work in that city. After the river was opened by the fall of Vicksburg and surrender of Port Hudson, two or three more operators were sent down the river and our work was no longer one of hard labor. Of these S. L. Griffin was sent to Baton Rouge and others to different points.

Shortly after the middle of August, I went to New York to superintend the manufacture and shipment of some cable for the river at New Orleans, and just as this was completed and ready for shipment I was taken ill with typhoid fever, and when able to be about again tendered my resignation from the military service.

Speedy Telegraph Work at the Denver Convention.

The telegrapher was in evidence at the Democratic National Convention at Denver. This is what the Republican of that city had to say about some of the operators who were present on the occasion and of the records they made:

"Never in the history of Denver has the city contained, at one time, as many shining lights in the telegraphic profession as were serving the different press associations and telegraph companies at the time of the convention, and many records of long distance telegraphing have been broken. In one instance the world's record for fast transmission of press matter, even on short circuits, was broken on one of the Western Union wires between Denver and New York, a distance of over 2,000 miles.

"'Old Farmer' Lawton, who personally knows many of these men and has their record for fast work in the past, has been keeping tab on them to see what effect cool nights and sunny days would have upon their nerves.

"George W. Conkling chief operator for the New York's Sun's Laffan service, who holds more prizes for fast sending than any other operator in the country, was brought out by the Sun people to overcome the shortage of wires in the West. July 7 Mr. Conkling transmitted direct into the Sun office from Denver 14,740 words in three hours and twenty-three minutes, or an average of 2,739 words per hour, at most fifty words per minute. He kept up this average every evening until Friday, when just to show the boys that he still retained his old time grip and was not worried over a few days' hard work, he sent 10,370 words direct into the Sun office in three hours and twenty minutes, or an average of 3,100 per hour. Lawton thinks this record will stand for many years to come, and what pleases him is the fact that one of his old Denver-raised boys, Harry R. Clark, copied it in New York and has broken another world's record as to fast receiving. Some of the editors on the New York paper are old-time telegraphers, and for several minutes their own duties were stopped while listening to the wonderful rapid work.

"Lawton names the following men brought to Denver for the occasion who made enviable records during the convention: Paul Ende and Ed Lindley, of their Chicago Tribune force; A. J. Salack, W. H. Meacham, Fred Lesem and M. J. Dugan, of Chicago, and the noted W. L. Waugh, of New York, and J. Simmonds of the same place. For years operators all over the country took off their hats to Mr. Waugh, and he is just as nimble with the key to-day as he was when he made a

world's record, after the assassination of President Garfield.

"Some more very rapid work, if not the fastest ever done for The Associated Press, was accomplished by George R. Allen, chief operator of that organization in Denver, and Ernest W. Emery, their chief operator at Washington, D. C., who was here handling The Associated Press bulletin service. They are two of the fastest men in the service and by relieving each other at intervals they kept up a speed that General Manager Melville E. Stone has heard nothing but the highest praise for from every large paper in the United States, that The Associated Press serves. Allen is a Denver-raised boy and Mr. Emery was one of the first men to copy The Associated Press for the Denver papers, back in 1879. J. J. Rafter, of The United Press of Chicago, was not here for the past good he had done, but to speed, and his perfect Morse was watched at every repeater station on their lines.

"Another fast man was Harry Hollingsworth, who was sent here in charge of the Hearst service and was not supposed to do any telegraphing, but after hearing that others were smashing all previous records, off went his coat, and for a few hours during one of the sessions, dots and dashes were shooting out of Denver at a speed that made Farmer Lawton wish he was not one hundred and fifty years old, so he could copy it. Denver, too, has some stars, but they did not go after any records. They will when the next convention comes to Denver."

Book Notices.

The "New Catechism of Electricity," by N. Hawkins, M. E., covers so wide a range in its consideration of the field of applied electricity, as to attach peculiar value and significance to the volume. Few there are, comparatively speaking, who are in a position to take advantage of the technical training afforded by special schools and the science departments of colleges and universities. The workshop must of necessity continue in large measure yet to furnish and develop the electrician of whatever grade, of the future. Such a volume as the one under consideration affords a distinct help to the student and seeker after aid in electrical matters. It is a practical treatise prepared with especial care and knowledge of the subjects presented, by an author of extended reputation and versatile information, whose numerous educational works are well known. In its treatment it includes the dynamo and motor; wiring; the electric railway; electric bell fitting; electric lamps; electric elevators; electric lighting; electric plating; the telegraph and telephone; measurements, tables, etc. The book, which is abundantly illustrated, embraces nearly 550 pages, is bound in red durable leather with gilt-edged leaves—a handsome and substantial volume. It will be sent on receipt of price, \$3, to any address, carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

The Motor-Driven Wheatstone Transmitter.

BY C. C. VYLE AND E. V. SMART.

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

Wheatstone's automatic system is the best system in the world where the economy of line wire is concerned. Four hundred words a minute can be passed over the wire, as against about one hundred by the next best system. This means that three wires at least between the two stations are saved. When great pressure exists on a circuit Wheatstone working is resorted to. When a special event of any importance takes place it is the Wheatstone system that is used to dispose of the work. It is the Wheatstone system that transfers the news of the world from London to all parts of the United Kingdom. When a general breakdown occurs it is by means of the Wheatstone system that the work is disposed of over the few wires remaining. The Wheatstone system is to any keyboard system what our fastest express trains are to the old stage coaches. The staffs at both ends, one lot punching and feeding the transmitter, the other receiving the news and writing it up, soon dispose of the work. One drawback is the writing up of the slip, especially by artificial light; the constant transfer of the eyes from the moving slip to the writing and vice-versa, is a strain. This might be remedied by producing a slip, which, by being passed through another instrument, could be read by sound.

When required for retransmission purposes the slip might be gummed on a form. It would be as easy to send from the slip so gummed as from the written words. Much time might be saved by adopting the latter method. Again, instead of the present form of Wheatstone perforator a keyboard perforator would greatly increase the speed of punching. Enough has been said to show the great utility and supremacy of the Wheatstone system in circumstances when speedy transmission over the line wire is of the utmost importance.

Although many years have elapsed since Sir Charles Wheatstone introduced his automatic system, very little has been done to improve the transmitter, and it remains to-day practically as it was when first invented. The driving of the transmitter is a matter which has received a great deal of attention with a view to abolishing the use of the heavy weights at present used, and it is in connection with this subject that the present article deals.

It is now more than twenty years since the need of a motor-driven transmitter was first felt. When it was necessary to obtain high speeds, the practice was, and still is, to tie extra weights to the driving weight; this frequently ended in disaster and the suspension of work until a fresh transmitter had been obtained. The difficulty in obtaining high speeds was the prime cause of a motor-driven transmitter being sought, but many other reasons can be advanced for the demand. Some of these are; First, to obviate the need for

weights (forty-five pounds each) and weight guards; second, to avoid transmitters "running down" during the transmission of messages, and the consequent confusion, loss of time, and repetition of work; third, to relieve the operator of the labor of frequent winding, leaving him free to attend to slips, etc; fourth, to minimize the liability to shocks. Shocks have occasionally been experienced by operators while winding transmitters. In this connection it may be mentioned that an extra terminal was recently provided on the transmitter for the purpose of connecting the framework of the transmitter to earth; fifth, to insure constant speed of the transmitter when used in connection with apparatus where "slowing down" or "racing," due to overwinding, results in malformation of the signals, rendering the slip unsuitable for retransmission or printing purposes; sixth, to prevent the cutting of instrument tables to provide for the movement of the chain attached to the weight.

When the need was first felt, an electrically-driven transmitter was designed, but this, in common with others since designed, did not give constant speed, and on this account the signals were unreliable. Other electrically-driven transmitters have been unsuitable, because, in arranging for varying the speeds of the motor by shunting some of the current, considerable overheating took place; they, too, were subject to the troubles of momentary racing and irregular running. Air-driven transmitters were also tried, but were unreliable, on account of the difficulty in maintaining constant pressure. The air actuated a fan that was attached to the driving axle.

The Hughes instrument is one to which motor-driving has been successfully applied, but in this case the instrument is driven at a constant speed and the work done is kept constant by means of a governor.

The requirements for a motor-driven Wheatstone transmitter are: First, it shall be capable of running at any speed required for Wheatstone circuits; second, it shall give constant speed when run at any given rate; third, the motor and controlling apparatus shall not overheat, and, fourth, the speed must be easily controlled.

Small motors with electrical governing, such as are required for Wheatstone transmitters, are not easy to design when all the requirements mentioned have to be met, and all attempts hitherto have failed. Mechanical means have been attempted, but have not, until the present instrument was designed, proved satisfactory.

Small motors to be efficient should have their armatures to revolve at constant high speeds. If the efficient speed of the motor be too high for the purpose required, it should be reduced by gearing. This is the fundamental principle of the motor-driven transmitter designed by the writers.

Choose a motor of sufficient horsepower to do the work easily and keep its speed invariable and high. With this explanation the description of the instrument should be easily followed:

A motor, 110 v. 1/16 horsepower (series wound, for a reason to be explained later) has a

thick German silver plate fitted at one end of the axle: this, backed up and made rigid, is used as a friction plate. On the front of the friction plate rests the edge of a friction disc, consisting of two thicknesses of compressed hide held tightly between two metal plates. The metal plates are slightly less in size than the hide discs, to prevent the metal touching the friction plate.

The contrivance determines how the friction plate and disc are kept in firm contact. A ball is held to the end of the armature axle remote from the friction plate. A short piece of steel, each end of which is connected to the shell of the motor by a spiral spring, presses on the axle by way of the ball bearing. The friction plate might be kept to its work by the motor being so placed that the armature, in striving to get to its normal position when running, keeps the friction plate forced towards the disc. (When a motor is running, the armature, if free to do so, places itself in a certain definite position, and considerable force is necessary to move it from that position. If, now, the motor be so set, with respect to the friction-disc, that the friction plate just touches the disc and the armature is to the left of the position referred to, the force tending to bring the armature to the right will keep the friction plate up to its work.)

The friction disc is fitted on an axle, at one end of which is a pinion gear to which the driving axle of the transmitter is connected by means of a clutch: at the other end is a cup-like end into which fits a pointed termination of the adjusting screw, this latter being in alignment with the friction disc axle.

The method of varying the speed is on the well-known principle that the various parts of a revolving wheel have different speeds through space, e. g., any part of the periphery of a wheel travels much faster than a part near the center. The adjusting screw pushing the friction-disc axle inwards, causes the friction-disc to be carried from the center to the periphery of the friction-plate, varying the speed from slow to fast in so doing. To vary from fast to slow, another property of a revolving wheel has been utilized. The upper half of a revolving wheel has a motion contrary to that of the lower half, and anything rubbing against the side of a revolving wheel, if free to do so, takes up the motion of translation of that part of the wheel on which it rubs. Assume the friction-disc to be placed in the left lower half of the friction-plate near the periphery. On causing the friction-plate to revolve in a non-clockwise direction, the friction-disc will travel toward the center.

When an ordinary transmitter is started on a quadruplex circuit, we find, owing to the comparatively slow arrival at its proper speed and the line being disconnected for comparatively long periods during the time taken, that the signals on the B-side are interfered with. With a series-wound motor-driven transmitter, the speed desired is obtained almost instantaneously on

account of its great starting powers. The work for the motor-driven transmitter is practically constant, so that variation in speed due to variable work has not been allowed for; the friction introduced by the paper is negligible on account of the friction already present.

A dust-proof switch is used to start the instrument. This switch operating a bell crank lever connects the power leads to the motor, the batteries to the transmitter contacts, and also makes the connection through the transmitter as in weight-driven instruments.

The clockwork or front portion of the transmitter is attached to the driving portion by means of a clutch so shaped that the need for a given position to grip is obviated: it fits in any position. The connections are provided by means of buffer contacts. When the front portion is pushed into position, the contacts are securely made and a raised edge keeps the front pressed back. It is clamped by two plates and thumbscrews. The clockwork or train has been reduced to a minimum, the frame containing this portion being about one-half the size of that used for weight-driven transmitters. A change of transmitter can now be made very quickly. It has been demonstrated that the change can be made in ten seconds.

The instrument which has been described cannot be said to be a new instrument. A great deal of the valuable part of the weight-driven transmitter has simply been transferred to the motor-driven instrument. The instrument has been used recently in connection with some trials of the Wheatstone system between Edinburgh and London and has proved a boon to the operators, who speak highly of the relief afforded them.

Convention Conveniences.

At his farm in Lincoln, Neb., Mr. Bryan listened over the telephone to the speech putting him in nomination at the convention at Denver. At a distance of several hundred miles he could hear the proceedings almost as distinctly as if they were in the Lincoln Town Hall.

Mr. Taft enjoyed similar telephone and telegraph facilities while the Republican Convention was going on. So did President Roosevelt, who at the White House was able to direct what was going on at Chicago as quickly and as literally as if he were on the ground.

One of the first uses to which Morse's invention of the telegraph was put was for Silas Wright to telegraph his declination of the nomination for vice-president from Washington to Baltimore, getting it there in time for the convention to nominate George M. Dallas in his place. This was in May, 1844. Prior to the telegraph there was no opportunity for speedy consultation between an absent candidate and his friends at a national convention.

Telegraph Age is headquarters for electrical and telegraph books. Write for catalogue.

Chicago Postal Notes.

The many friends of Mr. James E. Pettit, for twenty-three years past chief operator of this office, and the well-known military telegrapher, who served his country during the Civil War with conspicuous ability, regret that he has been compelled to resign on account of continued ill health. It is hoped that his restoration will be effected by a complete cessation from business cares.

General Superintendent W. I. Capen, Division Superintendent T. W. Carroll, and First District Superintendent H. G. McGill, were in attendance at Denver at the Democratic convention, their presence being to promote the interests of the company.

The following were detailed to Denver to render assistance during the convention: Chiefs G. S. Palmer, F. W. Hans, B. D. Seymour and Fred Smith; operators, C. G. Simpson, J. J. Walsh, W. B. McCreary, E. A. Glessner, W. S. Atchison, J. J. Brosnan, Chas. Dortmund, Glen Heath, E. E. Bruckner, E. E. Meredith, J. E. Maloney, W. J. O'Brien, H. L. Heisler, C. W. Foster, Dave Hamilton and A. B. Heiberg; from the general office R. H. Ahlers, A. R. McGrath and Robert Heath.

G. K. Smith was detailed to take charge of the temporary repeater plant at North Platte, Neb., during the convention; E. W. Blakely to Dodge City, and J. H. Sprague, to Omaha.

L. O. Short, who has been ill for several weeks due to nervous prostration, will in a few days be removed to his old home at Delevan, Ill.

Charles Reinert, night chief of the Metropolitan and an enthusiastic turner, is spending his vacation in Europe at the International Turn Fest.

J. P. Garrison, having recovered from an extended illness, occasioned by a broken limb, is again with us.

R. G. Harris, chief of the Rowland, has gone to his home at Baltimore, on a vacation.

A. G. Drake, A. O. Wilder, Fred Smith and H. H. Dengler have returned from their vacations.

New York Western Union.

Geo. L. Marshall, formerly of the operating department and lately located at Denver, Colo., has returned East, accompanied by his bride. Mr. Marshall has been assigned to the Eastern division.

Chief Operator T. A. McCammon of the general operating department, has returned to the city after enjoying an extended trip through Canada.

Mr. and Mrs. Rankin, formerly of Chicago, but more recently employed here, have resigned.

Mr. J. F. E. Hopkins, assistant wire chief, has returned after a sojourn in the mountains.

The following summer assignments have been made: Mrs. Ethel Curtis at Jamestown, R. I.; Miss May Dolan, at Shelter Island, N. Y.; Miss Blohm at Asbury Park, and Mrs. L. Kirschbaum at Hollywood, N. J., and Mr. E. Mesler at the State Camp at Sea Girt, N. J.

Telegraphers' Mutual Benefit Assessment.

Assessment No. 481 has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of William H. Young, at Chicago, Ill.; Gustave M. Heiss, at Meridian, Miss.; William A. Morgan, at Lake Forest, Ill., and George Doerr, at Chicago, Ill.

The Associated Press.

Mr. L. E. Ladd, Jr., has been placed in charge of the Atlanta office of The Associated Press. Prior to his appointment there Mr. Ladd was night editor of the east wire in the New York office. Arthur W. Copp, who was temporarily in charge of the Atlanta office, has been appointed correspondent at Salt Lake City.

The Associated Press papers in Kansas, Missouri and Oklahoma are receiving their reports over a newly formed wire circuit. This circuit includes Joplin and St. Joseph, Mo., Leavenworth, Topeka and Wichita, Kans., and Guthrie and Oklahoma, Okla. It appears that in this way the association is able to handle items of more local interest to the immediate section concerned than before, when the circuit was made up through direct from Kansas City, Mo., to Salt Lake City, Utah.

Obituary.

Thomas T. Rabbitt, aged seventy-two years, a telegraph operator, died on July 14, at Washington, D. C.

Daniel G. Landager, aged fifty years, a telegraph operator at Cincinnati, O., died in that city on July 9.

Charles Moir, a Canadian Pacific Railway telegraph operator, was drowned at Medicine Hat, Assinaboia, Canada, on July 4.

John C. Witt, manager of the Postal Telegraph-Cable Company of Texas, at Houston, Tex., committed suicide on July 16, a result of several years of ill health.

Robert Yates, a member of the Telegraphers' Mutual Benefit Association, and a former employee of the Postal Telegraph-Cable Company, was accidentally killed on July 19, by being run over by a train on the Long Island railroad. His home was in Brooklyn.

Orders for books on telegraphy, wireless telegraphy, telephony, all electrical subjects, and for cable codes, will be filled by TELEGRAPH AGE on the day of receipt.

Mr. J. B. Bertholf, manager of the Jersey City, N. J., office of the Western Union Telegraph Company, is an old subscriber of Telegraph Age. A few days ago in again renewing his subscription, he wrote: "I hope I may be so fortunate as to continue doing the same for many years yet to come."

Telegraphers Aid Society Statement.

The Telegraphers' Aid Society of New York makes the following statement for the quarter ended June 6, 1908.

Balance on hand, March 6, 1908.....\$21,148.56
 Receipts 1,362.00

Total\$22,510.56

Disbursements.

Sick benefits\$1,090.51
 Death 300.00
 Expenses 195.40

\$ 1,585.91

Balance on hand June 6, 1908..... 20,924.65

Total\$22,510.56

Summary.

Disbursements\$ 1,585.91
 Receipts 1,362.00

Loss for quarter..... 223.91

Relief Fund.

Balance on hand March 6, 1908.....\$ 4,069.72

Disbursements 147.84

Balance on hand, June 6, 1908.....\$ 3,921.88

Total\$ 4,069.72

Balances.

Aid Society \$20,924.65 On deposit \$24,714.92
 Relief Fund 3,921.88 Cash on hand 131.61

Total \$24,846.53 Total \$24,846.53

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

The Rowland Multiplex Printing Telegraph System.

At this time when approved systems of printing telegraph are engaging public attention, and a wide-spread desire is manifest to study more carefully the methods involved in all such both in respect to their mechanism and in results achieved, the columns of Telegraph Age habitually afford descriptive references frequently covering the detail of such subjects at interesting length and in illustrated form. Thus, several years ago, or to be more explicit, on September 16, 1903, this journal published a carefully prepared analysis, embracing six and one-half pages, illustrated with line drawings, of the Rowland Multiplex Printing Telegraph System. The article attracted much attention at the time, both at home and

abroad, and ever since there has been a constant demand for the same. The edition containing the article was a large one and although the supply has been heavily drawn upon, there are about one hundred copies left which may be had upon request. Copies at twenty-five cents apiece will be sent to any address on receipt of price. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Notice.

Advertisers who use this special want column obtain excellent results therefrom. Frequently when expert help is required in any branch of the telegraph or allied services, as a rule the very best men available have been secured through the medium of this department. This has been so uniformly the outcome as alike to satisfy advertisers and please the publisher. Replies to advertisements coming as they do from all parts of the country, prove that these short, pithy advertisements catch the eye of thousands of readers.

The Serial Building Loan and Savings Institution, 195 Broadway, New York, established by telegraphers for telegraphers, has successfully conducted its business for more than twenty-five years. It is financially strong and its record is without a blemish. It solicits your account. It can help you to purchase a home. Why not inquire into its methods?

WANTED.—Information as to whereabouts of Operator E. J. Hamilton. Address "S," care Telegraph Age, New York.

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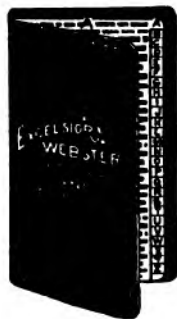
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 Alaskan Telegraphs Jan. 1-16, Feb. 1, 1904
 Atmosphere and Earth Electrical Conditions, E. C. Walker, Dec. 16, 1904
 Barclay Combination Quadruplex Rheostat July 1, 1903
 Barclay's Direct Repeating Relay for Multiplex Circuits, July 16, 1902
 Barclay Printing Telegraph System, W. H. Jones May 16, 1905
 Barclay's Repeating Relay, Main Line Relay and Box Relay, Jan. 1, 1903
 Barclay Typewriting Telegraph System Jan. 16, 1904
 British Patent Office Rules Apl. 16, 1905
 British System of Timing Messages Dec. 1, 1902
 Buckingham Long Distance Page Printing Telegraph Sept. 1, 1902
 Burry Page Printing Telegraph Apl. 1, 1903
 Cable Station in Mid-Pacific, Our, Dr. Martin Crook Feb. 16, 1905
 Central Telegraph Office, London Oct. 16, 1904; May 1, 1905
 C. K. Jones' Automatic Telegraph Circuit Protector and Signaling Machine June 16, 1903
 Collins Overland Telegraph May 16, 1903
 Composite Teleg. and Telep. on Canadian Pacific Ry Mch. 1, 1904
 Composite Telephones Lines Mch. 1, 1906
 Crehore-Squire Automatic Telegraph System May 16, 1902
 Definitions of Electrical Terms, Mch. 16, Apl. 1-16, June 1, July 1-16, 1904
 Delany's, P. B., Automatic Telegraph System Mch. 16, 1903
 Delany's, P. B., New System of Rapid Telegraphy Apl. 16, 1904
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 Postal Telegraph-Cable Company, History of (with portraits of officials) Feb. 1, 1904
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 Printing Telegraph Systems, Modern High Speed, J. C. Barclay Nov. 1, 1904
 Printing Telegraph Systems, Story of Jan. 1, 1903
 Progress of Telegraphy During Last Thirty Years, W. Mavor, Jr. Mch. 16, 1904
 Proper Adjustment of Telegraph Apparatus Aug. 16, Sept. 1, 1904
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 Random Recollections of 146 Broadway, W. P. Phillips Feb. 1, 1903
 Rapid Telegraphy, P. B. Delany Nov. 16, Dec. 1, 1904
 Reminiscences of New York Telegraphers a Quarter of a Century Ago Jan. 1-16, Feb. 16, Mch. 1, 1906
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 Horton Mch. 1, 1902
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 Scott-Phelps-Barclay-Page Self-Winding Ticker Oct. 1, 1903
 Simultaneous Telegraphy and Telephony Aug. 16, 1903
 Specifications in Construction of 26-foot Pole Line, American Telephone and Telegraph Company Feb. 16, Mch. 1-16, 1904
 Stevens' Wheatstone Transmitter July 16, 1902
 Stick Telephone, J. O. Barclay June 16, 1904
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 Telautography Aug. 1, Dec. 1, 1904
 Telegraph Alphabets Jan. 1, 1904
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 Telephonage, The June 16, 1902, Mch. 1, 1903
 Telephone and Telegraph Bureau, U. S., Washington, D. C., May 1, 1903
 Transmitting Typewriter Wire Connections Feb. 16, 1904
 Typewriting Telegraphs, L. S. Wells Aug. 1, 1904
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Wind Pressure on Telegraph Structures, F. W. Jones Dec. 16, 1903
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 Yetman Transmitter (Description and Engraving) Aug. 1, 1903
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 Braun's New Method of Directing Wireless, A. Fred'k Collins Apl. 1, 1906
 Churcher Rectifier, J. P. McCabe May 1, 1906
 Electrolytic Wireless Receiver, D. L. Beardley July 16, 1906
 Fire Alarm Telegraphs, History of Aug. 16, 1906
 Magini, Improvements for Practical Telegraphy Sep. 16, 1906
 Morse Patents, Covering Invention of Telegraph Dec. 16, 1906
 Morse Transmitters, Mechanical, F. W. Jones July 16, 1906
 Murray Automatic Page-Printing Telegraph, History of Sept. 16, 1906
 Phillips Code, Perfect, G. W. Conkling Apl. 16, 1906
 Postal Telegraphy, Congressman Smith on Aug. 16, 1906
 Pneumatic Tube Improved System Aug. 1, 1906
 Reminiscences, Old Time, Dr. L. M. Rheem, Apl. 16, May 1-16, 1906
 Hudd Revolving Addressed Envelope Holder Feb. 16, 1906
 Sweeney Pole Splicing Device Sept. 1, 1906
 Standard Time June 16, 1906
 Storage Batteries, Willis H. Jones, Mch. 16, Apl. 1-16, May 1-16, 1906
 Telegraph Tournament, International, at Boston, May 1-16, June 16, July 16, 1906
 Telegraph vs. Telephone July 16, 1906
 Telephone, Invention of Apl. 1-16, 1906
 Testing by Voltmeters and Ammeters, F. W. Jones Nov. 1, 1906
 Train Order Rules, Chas. Seiden Aug. 1, 1906
 Wire, Hard Drawn Copper, History of, Thos. B. Doollittle, Jan. 1-16, 1906
 Wheatstone Bridge, F. W. Jones Nov. 16, 1906
 Wright Keyboard Transmitter and Printer, B. Hiltchcock Apl. 1, 1906

Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Detroit, Mich., June 24, 25, 26, 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 Detroit, Mich., August 19, 20, 21.
 Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.
 Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.
 Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.
 Train Dispatchers Association meets in 1909 at Columbus, O., at a date to be determined upon.
 The stockholders of the Western Union Telegraph Company meet the second Wednesday in October, at New York; election of officers occurs on the third Wednesday in October.

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

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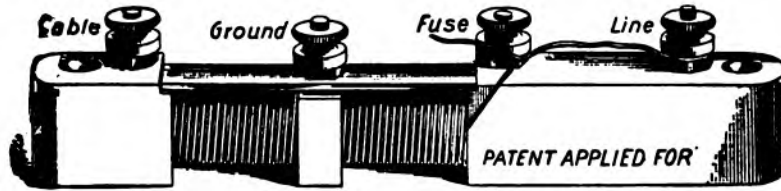
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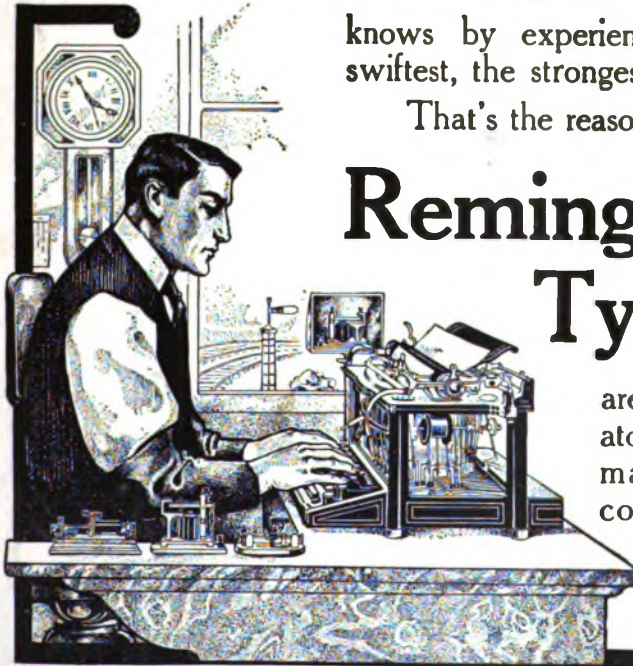
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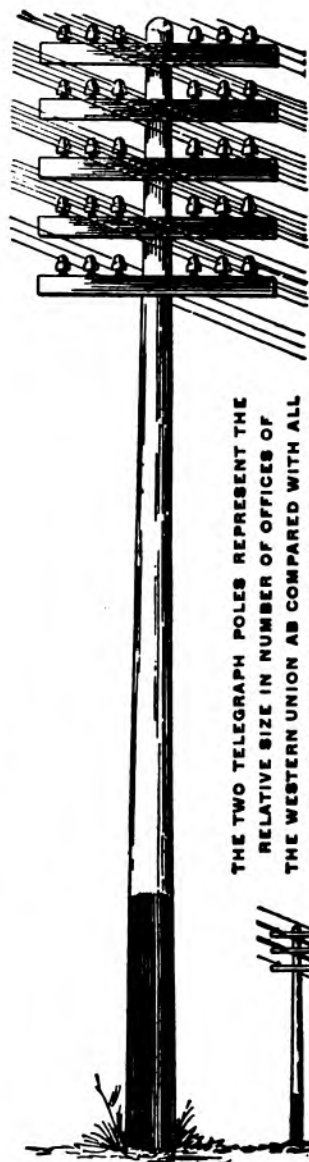
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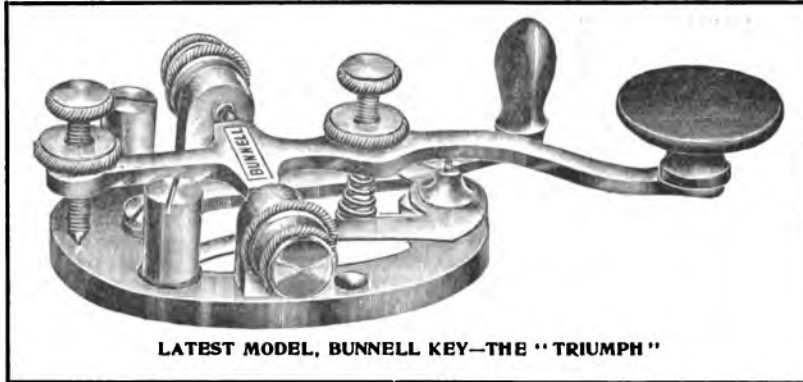
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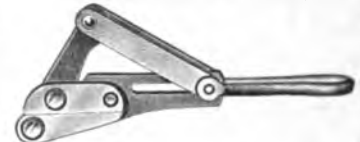
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SOME POINTS ON ELECTRICITY. Current Volume in Divided Circuits.

BY WILLIS H. JONES.

The following inquiry from "J. D. B.," a Boston correspondent, is somewhat ambiguous as regards the kind of a circuit he refers to, but as the subject of current volume in divided circuits is an interesting one and often perplexes young electrical students we will use it as the basis for an article on that subject. Our correspondent writes:

Please state for the benefit of myself and a few interested beginners, the manner in which a given volume of current is made to divide and flow through a circuit in a given ratio. I know there is a rule for ascertaining this fact but cannot recall it.

In the pursuit of electrical knowledge, or for that matter, when seeking information on any subject, the conductor of this column has always found it helpful to study a writer who, while thoroughly in harmony with the standard text-books, at the same time is independent enough to break away from the conventional form and treat the subject from an entirely different standpoint. In this way he often clears the mental atmosphere and the reader, because obtaining a different view of the subject, overcomes doubt and perplexity.

To illustrate this point, let us recur to the subject of current flow in divided circuits. The conventional text-book manner of explaining what occurs in such circuits is in effect something like

this: "A certain volume of current flowing through a wire or feeder will, when it reaches a point where it finds one or more channels of escape offered, divide between the various outlets, or side circuits, in proportions inversely as regards their respective resistances; and that the sum of the different volumes in the branch circuits will be equal to the original volume of current flowing through the feeder, as far as the first tap."

Now, while this statement is correct, as applicable to a divided circuit already established, it does not mean that in the event of the original resistance of a circuit being altered by the addition of a branch or leak, that the sum of the separate volumes of current then flowing therein will be the same as flowed through the original circuit, although it will equal the volume that reaches the point of division after the leaks have been added. In other words if a conductor carries, say, one ampere of current, you cannot add a leak to the circuit with the idea of getting, say, exactly one-half an ampere in each leg. If the respective resistances of the two legs or branch circuits are identical, each will be found to have more than one-half an ampere of current, because the total resistance of the circuit has been lessened and consequently draws more current from the battery.

These fluctuations in current value, due to alterations in a circuit, naturally perplex young students who sometimes interpret the conventional explanation literally and without qualification.

Another way to treat this subject, is to disregard the division of a given volume of current into different proportions altogether and look at it from the following standpoint:

The volume of current that will flow through any branch or leak, regardless of the volume that flows through the feeder, will be in accordance

with Ohm's law $\frac{E}{R} = C$, where E will be the value of the electromotive force of the battery taken at the point where the branch or leak is connected to the main wire, and R is the resistance of the leak circuit.

No matter how many side circuits there are, this rule holds good for each and every tap that is made. If the taps were all made to the conductor at one point the value of E in volts would be the same for each circuit, but the volume of current each leg would absorb, would be governed by their respective resistances. If the taps were made at different distances along the circuit (ohmically speaking) the value of E , at each tap, would be different at the junction of each

branch circuit. Hence as the initial value of the electromotive force of a battery falls from maximum to zero, in direct proportion to the percentage of the total resistance it surmounts, it follows that if it is desired to obtain a pressure of, say, 100 volts for a side circuit, where the initial electromotive force of the battery is 300 volts, we must insert twice as much resistance between the dynamo and the tap, as the joint resistance of the branch circuits beyond it amounts to. In this way the voltage, having overcome two-thirds of the circuit's ohmic resistance, will have dropped to one-third of its full value, or 100 volts.

Of course, this rule for regulating the value of electromotive force at any given point, is subject to the same qualifications as that which governs the constancy of the volume of current to be "divided" in the conventional explanation, viz., it is only true where the resistance of the circuit is of a constant value; that is to say, not subject to alteration through temporary removals of any of the branch circuits. The opening of a side-line will increase the value of the electromotive force at each remaining tap and consequently alter the volume of current therein. Possibly this view of the action, which occurs in a circuit, may not be any more explicit than the conventional one, but it, at least, shows why and how the results are accomplished.

When it comes to devising a means of alternately decreasing and increasing the volume of current flowing through divided circuits in a given degree or proportion, so that the resistance of the external circuit shall not be altered, such as that of the main and artificial line of a quadruplex circuit, we do not take any original volume of current into consideration and then attempt to divide it, but deal directly with electromotive force. We simply add a tap or leak to the circuit containing the required resistance, which in conjunction with another coil, called the "added resistance," as a side partner, will drop the value of the electromotive force of the battery two-thirds or three-quarters according to the ratio desired when the transmitter connects the combination in circuit.

As the temporary addition of this leak and assistant coil to the multiplex circuit must not alter the total resistance of the external circuit the respective values of the two coils must be made such that their joint resistance will be equal to the resistance of the multiplex circuit, as far as the tongue of the transmitter. As there is practically no resistance up to that point, except that of the battery, 600 ohms battery resistance has been made standard as the value of the permanent resistance in the circuit up to that point.

In order to ascertain the amount of resistance the leak and the added resistance coils each shall contain, in order to have a joint resistance of exactly 600, and at the same time drop the value of the electromotive force in a given ratio, we have the following formulas:

For the added resistance coil, $B(R-1)$, where

B—internal resistance of battery, and R, the ratio desired. Thus, where 600 is the battery resistance, we get: $600 B \times (4-1) = 1800$ ohms, when the ratio is to be 4 to 1; and $600 B \times (3-1) = 1200$ ohms for 3 to 1.

For the leak coil, $\frac{BR}{R-1}$

Thus $600 \frac{B \times 4 R}{4 R - 1} = 800$ ohms when the ratio is

4 to 1, and $\frac{600 B \times 3 R}{3 R - 1} = 900$ ohms

for a 3 to 1 ratio. It will be seen that the joint resistance of both combinations, 900 and 1800, and 800 and 2400, is the same, viz., 600 ohms; and if you take any other value for the battery resistance and ascertain the required resistance of the leak and added resistance coils by these formulas their joint will always be equal to that of the battery resistance you decide upon, no matter what ratio is used.

Recent Telegraph Patents.

A patent, No. 894,044, for an electric selective system, has been granted Frank D. Pearne, of Chicago. Printing telegraph system, including various detail features.

A patent, No. 894,142, for a telegraph transmitting instrument, has been issued to Frederick H. W. Higgins, London, England. In a type-printing telegraph system in combination with a number of electrical circuits are intermittently moving means for carrying type in one of the circuits, printing means in another circuit, together with means for controlling the intermittently moving type means.

A patent, No. 894,143, for a perforating, punching machine, etc., has been awarded to Frederick H. W. Higgins, London, England. Associated with a number of key levers is a number of electrical contacts and electromagnetic punches, the depression of any key lever closing an invariable number of punches.

A patent, No. 894,165, for a telautograph, has been taken out by Foster Ritchie, of Acton, England. Has means for dispensing with the use of batteries, whereby a telautograph may be operated from any available current supply, whether direct or alternating. Makes use of an electric generator, the brushes of which are oscillated by the movements of the telautograph.

A patent No. 894,214, for telegraphy, has been granted Isidor Kitsee, of Philadelphia. The system is equipped with means to transmit induced true reversals and means to receive the same, the second means comprising a condenser inserted in the line, a shunt therefor, and a polarized receiver in the shunt.

The following patent has expired: Patent No. 457,239 for a printing telegraph held by H. Van Hoevenbergh, Elizabeth, N. J.

The Barclay Printing Telegraph System.

BY WILLIAM FINN.
(Continued—Part V.)
THE TRANSMITTER.

This instrument, a front view of which is shown in Fig. 17, has been considerably modified

The motive power for running the transmitter has also been changed to that of a small electric motor, by means of which a more uniform rate of speed can be maintained and the somewhat unsatisfactory operation of "winding up" entirely eliminated.

The motor is connected with a 110-volt source

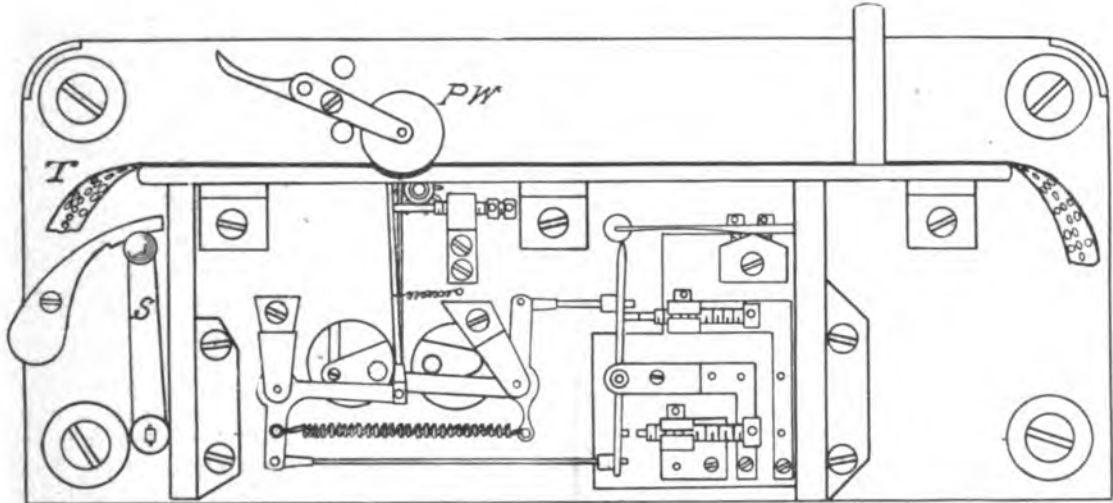


FIG. 17.—AUTOMATIC TRANSMITTER (FRONT ELEVATION).

of late years with the view of adapting it to the use of dynamo currents and other present day requirements. It therefore differs in its electrical details from those of the original apparatus, whose commutating arrangement for reversing

of current supply, a resistance of about eighty ohms being included in the circuit to reduce the potential to the required value.

The transmitter is now provided with a governor of the common ball type dependent upon cen-

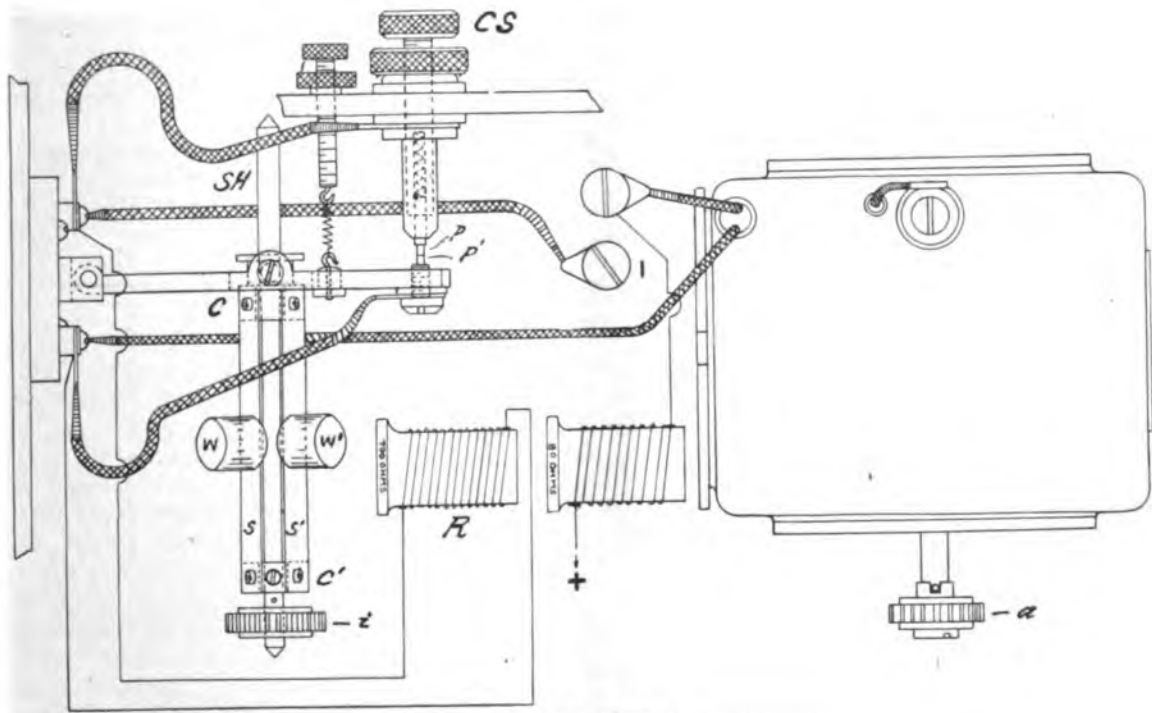


FIG. 18.—MOTOR CONNECTIONS AND GOVERNOR.

the poles of a single battery has been replaced by a polechanging device constructed on the principle of the "walking beam" polechanger for effecting the reversals with separate dynamos.

trifugal action for its operation. This device is seen to the left in Figs. 18 and 20 and is of such construction that when in the course of rotation the weights $W.W'$ (Fig. 18) overcome the tension

of the springs s, s' to which they are fastened, the contact point p, p' (through which the motor current normally flows) are forced apart, thereby

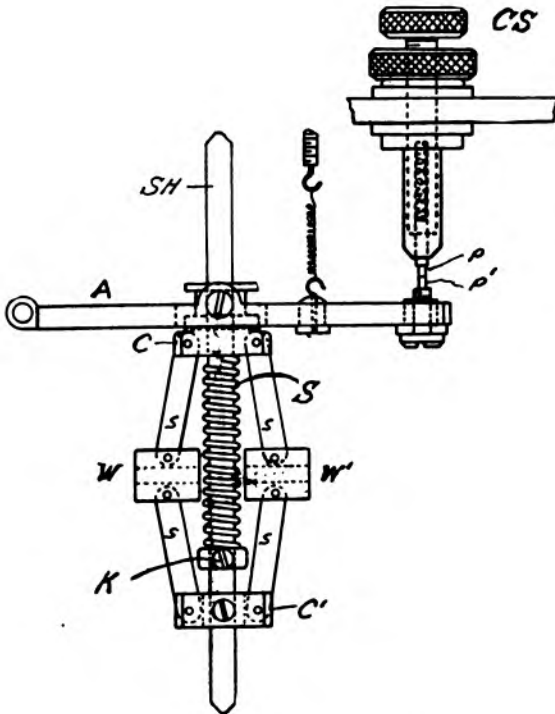


FIG. 19.—TRANSMITTER GOVERNOR (NEW STYLE).

throwing the resistance coil R in series with the motor windings and reducing the speed of the motor. When the contact points come together by reason of the diminished speed, this resistance is shunted out of the motor circuit, through

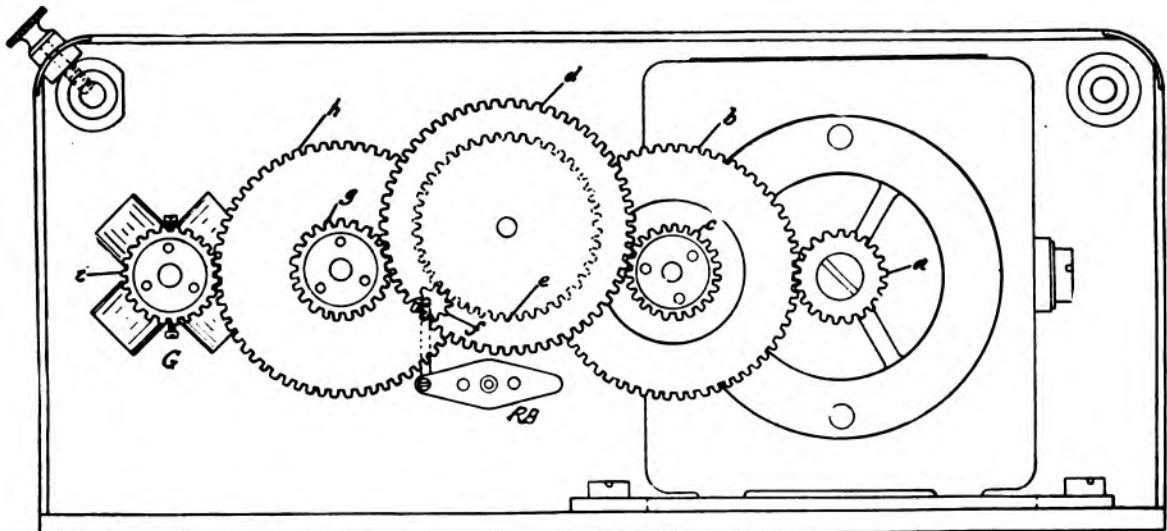


FIG. 20.—TRANSMITTER DRIVING MECHANISM.

which an increased current then flows causing the motor to speed up again. The points are, in fact, in a more or less continual state of vibration while the transmitter is running, and the variable resistance thereby introduced in the motor cir-

cuit tends to compensate for voltage variations or other irregularities, and to maintain the uniformity of speed so desirable for automatic work.

For obtaining any desired definite rate of speed certain preliminary adjustments of the springs s, s' (Fig. 18) can be made. The ends of these springs are mounted on collars C and C' , one of which (C) is free to move lengthwise on the shaft (SH) as the governor operates, while the other (C') is set by means of clamping screws on the shaft. To increase the rate of speed the adjustment must be such as will bring these collars closer together, and to diminish the rate of speed they should be pulled further apart.

The regulation of the governor is further effected by means of the contact screw CS (Fig. 18) which increases the speed as it is turned in a direction tending to bring the points p, p' together, and, of course, diminishes the speed with the reverse movement of the screw.

One objectionable feature in connection with this form of governor, is the tendency on the part of the springs to break at the points of fixture to the shaft, for which reason it is intended to equip all new transmitters with the kind illustrated in Fig. 19, which is better calculated to withstand the mechanical strains to which the device is subjected.

The same principle is involved in this arrangement as in that of the older form, and its method of operation is practically identical therewith. The improvement consists in substituting the flat rigid steel strips (s, s, s, s) for the flexible springs used in the old style of governor. These strips, as will be observed, are hinged to the weights W, W' , as also to the collars C and C' , the latter being firmly fixed to the shaft SH , while collar C

works loosely upon it under the combined action of centrifugal force and the tension of the spiral spring S .

In endeavoring to secure any different rate of speed than that to which the governor is origin-

ally set (approximately 100 words per minute) the following course of procedure should be followed:

First adjust the contact screw CS in such manner that the free end of the arm A shall occupy a position midway between its limiting movements. Then unloose the set screw (k) and push the spiral spring (S) in the direction of collar (C) if the speed is to be increased, and in the reverse direction if it is to be decreased. Any nicer degree of speed variation that may then be desired can be brought about by adjustments of the contact screw (CS).

As will be seen by reference to Fig. 20 the transmitter driving mechanism consists of the motor gear (a) which meshes with a friction idler gear (b) and thus transmits the propelling motion to the series of other gears (c, d, e, f, g, h, i,) through the instrumentality of which the governor (G) and rocking beam (RB) are brought into action.

Under the old arrangement of working this mechanism was normally idle, and only set in motion at such times as a slip was ready to run through the transmitter. Now, however, the mechanism is kept in constant motion during business hours, and an arrangement has been made whereby the starting or stopping of the punched tape through the transmitter can be effected more advantageously than under the old conditions. The improved method is such that when the switch S (Fig. 17) is thrown into its normal position (or to the left of that shown in the figure) the paper wheel PW (which had previously been bearing upon the punched tape T, as it passed through the transmitter) is raised from the tape which instantly comes to a stop, to be as quickly restarted at the same speed upon reversing the position of the switch.

(To be continued.)

Personal.

Mr. E. O. Munson, formerly of the sales department, has been appointed assistant advertising manager to Mr. H. C. Slein, of the Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y.

Mr. John H. Cox, cashier of the Western Union Telegraph Company at Cleveland, O., who is prominent in political circles in that city, has been elected president of the Cuyahoga County League of Republican Clubs. The Cleveland Leader in referring to the matter prints a picture of Mr. Cox.

Mr. J. E. Dunning, of Paterson, N. J., a well-known old time telegrapher, now retired, is spending the summer at North Asbury Park, N. J., in company with his wife and a married daughter and family, from Bound Brook, N. J. H. W. Dowling, Western Union traffic manager at Washington, D. C., accompanied by his family, was also a recent visitor at North Asbury Park.

An enormous amount of telegraph press matter was handled at Quebec previous to and during the time of the Tercentenary celebration. The Great North Western Telegraph Company established a special office in the Court House that city, for the exclusive use of newspaper correspondents and the military contingent. This was placed under the direction of J. G. Davies, manager of the Ottawa office, and here during the time referred to an operating staff of ten men were kept busy. Manager Davies, together with Mrs. Davies, were participants in numerous of the social functions incident to the occasion.

Mr. Charles H. Schermerhorn, for thirty-eight years manager of the Western Union Telegraph Company, at Plainfield, N. J., as well as serving Central Railroad of New Jersey interests, has been retired on a pension, granted jointly by these companies. He is seventy years of age. While yet a young man, and after several years of telegraph service elsewhere, he came to New York in 1853, and was placed in charge of the telegraph office located in Barnum's Museum, situated then at Broadway and Ann street. Subsequently he was made manager of the Brooklyn office. Mr. Schermerhorn is succeeded at Plainfield by Michael L. Griffen of that city.

The Western Union Telegraph Company.

EXECUTIVE OFFICES.

The Barclay printing telegraph system is being installed in the Nashville, Tenn., office, for communication with various points in the radius of which Nashville is the center. This system, it is interesting to note, is now handling upwards of twenty million messages a year in this country, a remarkable development, which has occurred during the past twelve months.

Belvidere Brooks, general superintendent of the Eastern division accompanied by his family, lately visited Newport and other watering places on the New England coast, making the trip on his yacht "Wacoutah."

Mr. A. G. Saylor, assistant general superintendent of the Eastern division, accompanied by Mrs. Saylor, is spending his vacation on an extended automobiling trip, visiting various points in his division.

Mr. George H. Fearons, general attorney of the company, who has been absent in Europe for a number of weeks, accompanied in his trip by his wife and son, has returned.

Mr. Henry D. Estabrook, solicitor of the company, is in Seattle, Wash., whither he has gone to attend a meeting of the American Bar Association.

Mr. George W. Brownson, manager of the Kansas City, Mo., office in spending his vacation, is dividing his time between the home of his parents in Toledo, O., and making extended trips around the lakes.

Mr. J. E. Palmer, formerly chief operator at Reno, Nev., is now with this company, at Ashland, Ore.

Postal Telegraph Cable Company.

EXECUTIVE OFFICES.

Mr. E. J. Nally, vice-president and general manager of the company, is again at his desk, after a vacation of three weeks spent in the mountains of Pennsylvania, his wife and children accompanying him.

Mr. Charles C. Adams, second vice-president, who with his family has been enjoying a visit to various points on the New England coast, is now in the Berkshires, and later will continue his trip to the Pennsylvania mountains, from whence he will return to the city.

Vacation days are being observed by other members of the executive staff, the latest absentee being Mr. Charles P. Bruch, the third vice-president, who is summering at Glen Cove, Long Island. His favorite recreation is yachting which he enjoys to the full on the Sound. Another who is about to leave, is Minor M. Davis, electrical engineer of the company, who will remain quietly at his home in Brooklyn, diversifying the time by frequent runs down on Long Island.

Mr. J. F. Skirrow, associate electrical engineer, and F. E. d'Humy, assistant electrical engineer, are again in harness, returning brown and much refreshed from their outing.

Mr. Harvey D. Reynolds, superintendent at Buffalo, and president of the Old-Time Telegraphers' and Historical Association, was a recent visitor.

Mr. J. H. Dorsey, assistant chief operator, at the Los Angeles, Calif., Postal office, has returned to duty, from his recent illness. In writing Superintendent Charles L. Lewis, at Los Angeles, Mr. Dorsey says, incident to his recovery: "I wish to take this opportunity of thanking you, and through you, the Postal Telegraph Employees' Association for the sick benefit which I received to-day. It is very acceptable and most highly appreciated, not alone for itself but for the generous and kindly spirit manifested governing its payment."

This company is fitting up a new main office at Augusta, Ga., on Broad street, near the present office, the work being done under direction of division electrical engineer J. P. Edwards.

The office at Ashland, Ore., is being rewired, and dynamotors are being installed in place of Callaud battery, under direction of division electrical engineer H. C. Shaw, of San Francisco. Ashland is the repeater station between San Francisco and Portland, Oregon.

During the convention at Denver, several quadruplexes were successfully operated between Denver and Chicago, a distance of over 1,000 miles. Mr. J. F. Looney, division electrical engineer at Chicago, is entitled to credit for the success of this long distance quadruplex work.

Mr. J. D. McClelland, manager of the Postal Telegraph-Cable Company of Texas, at Shreveport, La., has been appointed manager of the same interests at Houston, Texas, vice J. C. [Name], deceased.

F. N. Roberts, Postal Chief Operator at Chicago.

Frank N. Roberts, who has been appointed chief operator of the Postal Telegraph-Cable Company, at Chicago, is a native of Blairsville, Pa., where he was born in 1857. His connection with the telegraph dates from 1873, when he became an operator for the Allegheny Valley Railroad Company at Franklin, Pa. Subsequently he served the Union Pipe Line and the Atlantic and Pacific Telegraph Company in Pennsylvania, afterwards making a brief stay in Buffalo, N. Y. In 1881 he reached Chicago, there first entering the service of the American Union Telegraph Company, and later that of the Western Union. From 1883 to 1886 he was in the employ of the Baltimore and Ohio Telegraph Company, gaining promotions therein to the positions of night chief operator and chief operator. During a part of 1886 and 1887 he served as a broker operator, but owing to the failure of the house he was with, he obtained a position as an



FRANK N. ROBERTS,
Chief Operator, Western Union Telegraph Company, Chicago, Ill.

operator with the Postal company. In this service he has since remained, his proved abilities and attention to duty securing him steady advancement, his successive promotions being to that of assistant wire chief, wire chief, assistant chief operator and now to that of chief operator itself.

E. W. Miller, Postal Chief Operator at Philadelphia.

Earl W. Miller, lately appointed chief operator of the Postal Telegraph-Cable Company, at Philadelphia, is a young man to hold so important a position. Born at Royersford, Pa., in 1883, he is now but twenty-five years of age. He began his telegraphic career as a messenger boy in 1897, for the Philadelphia, Reading and Pottsville Telegraph Company. Acquiring the ability to telegraph he was appointed an operator for that company in 1900, a position he held until given a place as operator with the Postal company in 1903. A year later he was

promoted to be assistant wire chief, which, with the exception of a short service with the American Telephone and Telegraph Company, breaking into



EARL W. MILLER,

Chief Operator, Postal Telegraph-Cable Company, Philadelphia, Pa.

an otherwise continuous record at this post, he was recently advanced to the office of chief operator. Mr. Miller has made telegraphy the subject of careful study, applied electricity in all its forms engaging his attention, and he brings to his present position a mind well stocked with information and practical experience unusual in one of his age.

The Cable.

Cable communication was interrupted Aug. 12 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Lanzarote (Canaries)	May 18, 1908

Messages go by steamer from Las Palmas.

The Nantucket cable, owned by the Martha's Vineyard Telegraph Company, which has been interrupted since last November, has been repaired by the cable tug "Western Union," thus restoring wireless communication with the Atlantic steamers via Nantucket.

The Central and South American Telegraph Company's twin-screw steamer "Guardian," built in 1907, is stationed at Callao, Peru. She is one of the most modern cable steamers afloat; her extreme length being 293 feet, breadth 36 feet, with a deadweight capacity of 1750 tons, and a draught of 18 feet. She is equipped with the most modern picking up and paying out machinery and gear, and has a speed of twelve knots per hour.

Thomas Ellis, employed by the Direct United States Cable Company at their Halifax, N. S., station, died on August 2. He went off duty at three o'clock on the afternoon of that date and fifteen minutes later, while walking in the direction of his home he was attacked by heart disease and dropped dead in the street. Mr. Ellis was forty-

nine years of age and leaves a wife and six children. Many years ago he worked at the company's station in Ireland and later at the Tor Bay, N. S., office, removing to Halifax about twenty-two years ago when the cable station was transferred from Tor Bay to that city.

The Mexican Telegraph Company is the owner at the present time of two cable steamers, both of which are, now in the port of New York. One of these is the "Relay," which formerly belonged to the Central and South American Telegraph Company, and was built in 1890. She is 240 feet in length, 32 feet beam and has a registered gross tonnage of 1181. She has recently been thoroughly overhauled in New York and is to-day one of the finest cable steamers on the Atlantic. Her berth is at the Hoboken Land and Improvement Company pier, foot of 15th street, Hoboken. The other vessel is the "Mexican," which for many years has repaired cables in the Atlantic and Gulf of Mexico. This vessel is now for sale. She recently repaired the Western Union cable off Halifax, and is now berthed at Atlantic Basin, Brooklyn.

Convention of the International Association of Municipal Electricians.

The International Association of Municipal Electricians will meet for its thirteenth annual convention at Detroit, Mich., on Wednesday, Thursday and Friday, August 19, 20 and 21, making its headquarters at the Hotel Pontchartrain. Preparations for this event have been going actively forward, and a numerous gathering is anticipated. Considerable business of importance will be transacted, and a number of interesting papers, the titles of which have already been published in Telegraph Age, read. The officers of the association are R. A. Smith, president, Norfolk, Va.; J. B. Yeakle, first vice-president, Baltimore; B. A. Blakey, second vice-president, Montgomery, Ala.; C. F. Gall, third vice-president, Louisville, Ky.; Charles S. Downs, fourth vice-president, Altoona, Pa.; Frank P. Foster, secretary, Corning, N. Y., and C. E. Diehl, treasurer, Harrisburg, Pa.

The decision to hold the convention this year at Detroit, was influenced very largely by the very cordial letter received from William B. Thompson, the mayor, read at last year's meeting, inviting the association to that city, and tendering its hospitalities to the electricians.

Dominion Telegraph Company Elect Officers.

At the annual meeting of the Dominion Telegraph Company, held recently in Toronto, T. Swinyard was re-elected president; Sir Henry M. Pellatt vice-president, and F. Roper, secretary-treasurer. Including the officers the directors are: A. G. Ramsay, T. F. Clark, C. O'Reilly, R. C. Clowry, B. Brooks, A. E. Jarvis.

Radio-Telegraphy.

J. D. Oppe, general manager of the Marconi Wireless Telegraph Company, of Canada, has resigned.

Mr. Austin F. Parkhurst has charge of the wireless telegraph station for the United Fruit Company at Swan Island, distant five hundred miles from Key West, Florida. This station has no difficulty in communicating with points within a radius of five hundred miles.

A patent, No. 894,317, for electrode for electrolytic or liquid oscillation detectors for wireless telegraphy, has been awarded Lee De Forest, of New York. Includes a flat plate of conducting material fused into a glass receptacle and having special structural characteristics.

A patent, No. 894,318, for an aerophone, has been issued to Lee De Forest, of New York. A system whereby two moving trains, each provided with transmitting and receiving systems, may each communicate warning or direction indicating signals. Operates by wireless emanations between the trains.

A patent, No. 894,378, for wireless signaling apparatus, has been taken out by Lee De Forest, of New York. Includes a plurality of wave producers each having a period differing from the others, and a receiving apparatus having a plurality of supplemental wave responsive devices, and an indicating device connected with all of said wave responsive devices.

The Berlin Convention of November 3, 1906, with the Protocol, etc., has been ratified by the Governments of Germany, Belgium, Brazil, Bulgaria, Denmark, Spain, Norway, Holland, Roumania, Sweden, Japan, Mexico and Great Britain, and by the latter country also on behalf of Canada, Australia, New Zealand, Cape Colony, Natal, Transvaal and British Indies, and its other colonies and protectorates.

In Paris a new wireless telegraph station is in process of erection, on the Champ de Mars in which the apparatus will be so powerful that it is hoped eventually a message may be sent from it direct to New York. The station itself is underground, its place marked only by four poles which support wires running to the summit of the Eiffel Tower, which is used as an electrical conductor. The extreme height of the tower will enable the transmitters to send messages a very long distance. The new station was built by order of the Army and Navy Department as a consequence of the fine results obtained in sending wireless messages between the army in Morocco and the Presidential fleet in the Baltic. General Picquart, Minister of War, and M. Thomson, Minister of Marine, are directly responsible for the undertaking. Captains Ferrie and Frac will be in charge, and the station will be opened in January. The former Eiffel station had only 10-kilowatt power and could communicate only as far as Morocco, on the one hand, and Nova Scotia on the

other, but the noise of the spark could be heard clear across the Seine. The French recently decided to increase the station's power to 30 kilowatt to communicate with New York City. If they kept the larger station on a level with the ground, its sparking would have annoyed all Paris. The buildings would also have spoiled the scenic effect of the Eiffel Tower's graceful base. So the government decided to put the station underground. The superstructure of wiring—or antennae—will be led up to the top of the Eiffel Tower, as before, by means of a chimney.

Business Notices.

The Kellogg Switchboard and Supply Company, Chicago, has recently issued a bulletin describing their railway despatching system; also a bulletin describing the new Kellogg Railway Pole Telephone, with supplements giving account of Kellogg railroad systems in successful operation. Some of the advantages of the Kellogg train despatching systems are the safety, care and rapidity of train handling; the selective signaling of any or all stations and the services of telegraphers done away with. Experienced train men who have inspected the Kellogg railway pole telephone in actual service, say that its reliability, simplicity and accurateness are its strongest features.

W. R. Ostrander and Company, of 22 Dey street, New York, manufacturers of telegraph instruments and of other electrical goods, have issued their new catalogue—the fifteenth consecutive edition. The care with which it is compiled, is abundantly shown in its well-edited pages, indicating by illustration and description, including price list enumeration, the enormous number of specialties manufactured and handled by this firm. The detail entering into all this collation may be judged by the fact that the volume contains nearly 700 pages. The general index and that of catalogue numbers, is most complete, and indicates much careful work. It is a catalogue that a big electrical manufacturing concern may well be proud of.

Glass Telegraph Poles.

Europe is now beginning to use glass telegraph poles, remarks an exchange, and patents have been granted in Germany and the United States, for a machine to be used in their manufacture. The poles are said to be especially valuable in countries where wooden poles are quickly destroyed by insects or by climate. The Imperial Post Department of Germany, it is said, has already ordered that these poles be used in its telegraph or telephone lines. The poles will be more sightly than the present wooden affairs, and in countries where the forests are nearly exhausted, they will lessen somewhat the great drain upon the rapidly vanishing forests.

The Cable of Fifty Years Ago.

Fifty years ago, on August 5, 1858, the first Atlantic cable was successfully laid. The New York Evening Post of that date printed the following leading editorial of the event:

Such (the landing of the cable) is the startling intelligence which reaches us just as we are going to press. We find it difficult to believe the report, for recent events have prepared us for a very different result, and yet the dispatch comes to us through our regular agent, who would not deceive us. He may have been imposed upon, but that is quite unlikely. If the few coming hours shall confirm the inspiring tidings, and the cable is landed and in working condition, all other events that may happen through the world on this day, will be trifles.

To-morrow the hearts of the civilized world will beat to a single pulse, and from that time forth forevermore, the continental divisions of the earth will in a measure lose those conditions of time and distance which now mark their relations one to the other. But such an event, like a dispensation of Providence, should be first contemplated in silence.

The news, the importance of which William Cullen Bryant thus described, remarks the Post in its present day comment on the occurrence of half a century ago, was promptly confirmed by Cyrus W. Field himself. He had landed from the American frigate Niagara at Trinity Bay, Newfoundland, on the day before, and the end of the first Atlantic cable was soon ashore. The public did not restrain its joy or obey Mr. Bryant's man-cable is laid! The cable is laid! The village Stockbridge, Mass., where Mr. Field's family was, on the receipt of the news, "bells were rung, guns fired; children let out of school shouted, The cable is laid! The cable is laid! The village was in a tumult of joy." But not until the 16th of August did the real celebration begin, for the first message, from Queen Victoria to President Buchanan, did not arrive until then. That was a signal for New York to outdo the joy of the Stockbridge school children. The church bells rang, factories blew their whistles, the river front was illuminated by fireworks and bonfires, the Everett House displaying no less than 1,000 lights; there were transparencies everywhere, and finally the City Hall capped the climax by catching fire. There was a great procession, too, headed by the Central Park police, and including eleven hundred laborers and eight hundred carts from the Park and the Croton Reservoir, then in process of construction, all led by Messrs. Olmstead, Waring, Miller, and Grant. Altogether, the procession was three miles in length, and was properly reviewed at the City Hall by Mayor Tiemann. As it passed the Metropolitan Hotel, a Waldorf-Astoria of the day, its members read this sign:

MARRIED, AUGUST, 1858,

BY

CYRUS W. FIELD,

OLD IRELAND AND YOUNG AMERICA.

"May their honeymoon last forever."

Mr. Field was well entitled to all the praise showered upon him. He had been scoffed at, ridiculed, dubbed a crazy man, had sacrificed his business and his own means, and had previously made two attempts to lay the cable, only to be

thwarted. But as John G. Saxe put it in the jingle which appeared on September 11, 1858, in "Harper's Weekly":

Twice did his bravest efforts fail,
And yet his mind was stable;
He wa'n't the man to break his heart
Because he broke his cable.

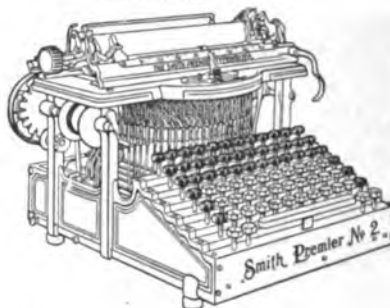
"Once more, my gallant boys!" he cried;
"Three times!—you know the fable"—
("I'll make it thirty," muttered he,
"But I will lay the cable!")

Unfortunately for all the rejoicings, for some unknown reason, the cable stopped working just at the time of the great official celebration in Trinity Church, and of the dinner of the Common Council to Mr. Field, at which there were served no less than eighteen entrees in addition to five roasts, boiled turkey and mutton and full thirty-nine desserts—New York's City Fathers were generous in those days! Not until after this gorgeous and barbaric function did the sad news come that this was but a fleeting triumph.

For Mr. Field this meant doing the work over again. The old company had exhausted its means, which were gone for all time; a new one had to be formed and fresh capital raised. There were endless trips to be made to the other side, his business again had to be neglected, and finally abandoned. The Civil War came, next; but this proved a help rather than a hindrance, and Mr. Field's alert brain made the most of it. He suggested cables between the Union posts in Charleston harbor; he pointed out how the existence of a cable would have robbed the Mason-Slidell crisis with England of much of its danger and made of it an incident of days instead of months, without the consequent ill-feeling and heavy expenditure on the British side for war preparations. Mr. Field did yeoman's work, too, in upholding the cause of the North in England when it was highly unpopular, and began a friendship with Gladstone to put the case of the North before him as strongly as possible. But his main efforts were devoted to the laying of a cable that would work, and this he finally accomplished, by the aid of the Great Eastern, on September 8, 1866, after another failure in 1865.

It is hard for the newspaper reader of to-day, or the merchant, to realize what he owes to the cable, or to gauge the thrill that went through the whole world just fifty years ago. The Atlantic crossing of the first ocean steamship was the only event to which the press of 1858 could liken the opening of the cable. But in our time great inventions have followed so closely on one another's heels that the discovery of wireless telegraphy is but a week's wonder, and evokes no municipal dinner or civic parade. Even the news of the record-breaking flight of the Zeppelin airship, which, despite its tragic ending, may figure in history as the real beginning of man's conquest of the air, is accepted, with the telephone and a hundred other conveniences, as merely another and well-discounted triumph of science. The world should never forget its debt to the pioneers, those like Cyrus W. Field.

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AUGUST 16, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous 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.

Telegraph Age at \$2 a year.

In the twenty-five years that Telegraph Age has been published, it has been furnished at the regular subscription price of \$1.50 a year. We feel confident that our readers will admit that this paper has steadily advanced in interest and value to the profession it aims to serve, during this quarter of a century, and that this improvement has been especially manifest of late years. Many, indeed, write in a complimentary tone to tell us so, all of which is most gratifying, for the production of the paper has alike demanded and received the best thought and painstaking effort on the part of its conductors. Nothing else, we are confident, would satisfy the class of readers whom we now have registered on our subscription

books, and who are located in all parts of the world. We may be pardoned for expressing the pride we naturally feel in this journal which in its constant progress, weathering all storms, has developed, expanded and shown independence in its impelling motive to provide a first-class and helpful telegraph paper. And we hope we may be further exonerated from all egotism when we put forward the claim that the paper is to-day serving the best interests of the telegraph, as it understands them to be. For it presents in each issue an amount of technical matter of a character calculated to afford practical help to every one engaged in any form of telegraph service, whether employed in this country or abroad. Not only this, it discusses and otherwise reflects in original and contributed matter, and in carefully selected miscellany, current news and the most enlightened mention respecting the telegraph in every phase of its many-sided relationships. That Telegraph Age is of interest to its readers is explained in a word—it is in vital touch with them. It is a telegraph newspaper in the best sense of that understanding, and as such it has no competitor in the world. Its worth is recognized by all foreign governments inasmuch as their departments of telegraphic administration take the paper for the broad scope of its information and progressive views advocated.

What we have said presents one side of the subject from which probably there will be entered no dissent. We wish now to speak of another aspect of the question, and in doing so desire to take our subscribers, whom we regard as our friends, into our confidence, behind the scenes so to speak, believing that a little heart to heart talk will be productive of good.

In every business as conducted to-day, the cost of material within the past few years has sharply advanced. The manufacturer, in order to maintain himself has been obliged to increase the price of his products. So, too, with Telegraph Age, the greatly enhanced cost of production makes it necessary that we should receive a higher rate for subscriptions than that so long maintained. Accordingly it has been decided to raise the subscription price from \$1.50 to \$2.00 per year, the same to go into effect on September 1. All subscriptions, domestic or foreign, mailed to us prior to that date, and reaching us subsequent thereto, will of course, be entered at the present rates of charge. After that date the domestic rate, which includes papers going to all points in the United States, Mexico, Cuba, Porto Rico, and the Philippine Islands, will be \$2; Canada, \$2.50, and other foreign countries, \$3.00. Even at these rates Telegraph Age remains one of the lowest priced of so-called trade papers published.

We have arrived at this conclusion reluctantly, but facts in any given situation are stubborn elements to be considered, whether faced in the career of a newspaper or in that of an individual. The cost of paper, of printing, and in numerous instances that of postage, (resulting practically

in many hundreds of cases of furnishing the paper to the subscriber at but two cents a copy), without enumerating the added high cost of supplies of all kinds, have gone up—have been going up, and now Telegraph Age must as a measure of self-protection take cognizance of this change affecting every department and item of expense. The addition of fifty cents in the yearly subscription price will not mean much to the individual, yet in the aggregate to Telegraph Age the difference will amount to considerable and render the expense of publishing less severe.

It is hoped that our subscribers will cheerfully acquiesce in this change and sustain us in this obligatory move in the future, with the same loyalty of purpose as that evinced in the past. Telegraph Age will not only be maintained at its present state of excellence, but its conductors are ambitious for its future. Our readers will receive even a fuller equivalent for their money than ever before.

What the Telegraph is Up Against.

The woes of the telegraph are many. This time the difficulty appears to be with a gentleman out in Arkansas who has got his fighting blood up and who is fiercely demanding satisfaction of the telegraph to the extent of \$1,000—not a cent less. It all came about because of the failure of a messenger boy to deliver a message to the now irate individual, the plaintiff in the suit, and then incidentally because the young mercury said things, thus injecting a pungency into the transaction that gave it abundant additional life and color. The messenger was instructed to deliver a message that bore an address that long since had become obsolete by reason of the removal of the addressee. Then the telegraph emissary redoubling his efforts, pursued the object of his quest to other addresses furnished him at his last place of call, going up one street and down another in an altogether vain search. His endeavors to locate the elusive individual were like the pursuit of the will-o-the-wisp. At length, prompted doubtless by weariness and disgust born of futile attempt, the boy finally blurted out in sheer desperation that he "would be d—— if he went any further to chase any man," and accordingly took the message back to the office. Perhaps it is the human attribute that we recognize as finding expression in the final words and action of this Western messenger boy so like his Eastern prototype, that causes a smile to play across one's features. It is doubtful whether any court will rule against the boy and so incriminate the telegraph company, even though the plaintiff lost a job, as he alleges he did because the telegram did not reach him.

Mental anguish to the value of five thousand dollars figures in an Ohio suit against the telegraph, due to the difference between the words

"drink" and "die." There is no doubt that these two words are invested with a separate and distinctive meaning, although it must be admitted that their close correlation sometimes stands out in the expression "Drink to die," or its reverse, "Die to drink." In this particular case it is claimed that a telegram was sent from a neighboring state to a gentleman to inform him that his son was engaged in the reprehensible practice of drinking. The message is alleged to have been written: "He is drinking; what do you want done?" When the telegram was delivered its phraseology was declared to have undergone a transformation, inasmuch as it transmitted the information that the son was "dying," not "drinking."

Apparently the understanding conveyed in the word "drinking" was regarded as a negative quality, "dying" being positive. This difference in meaning between the two was estimated to be worth just \$5,000, a basic sum, as determined, that should properly be charged up to that mysterious condition denominated "anguish," to which "shock" was supplemented; while a further amount of seventy-four dollars was added to cover the cost of traveling expenses claimed to have been expended in order to reach the supposedly dying son.

It may be that an intelligent jury, if the case ever reaches that decisive body, will consider that the "anguish" complained of constituted a necessary parental arousement, and that the seventy-four dollars expense incurred was money well spent in transporting the father to the moral rescue of the son.

A year ago, owing in part to the then prevailing high price of copper, the tax assessment of the telegraph companies was sharply advanced in many of the states. Now that the cost of that metal has dropped back again more nearly to its normal value, it would appear to be an act of justice were the states to take cognizance of that fact and govern their telegraph tax assessments accordingly. This view of the situation, however, does not seem to prevail, although the equities that should obtain are clear. While the market rate for copper formerly came under close scrutiny as an important factor in determining valuations for purposes of taxation, the price of that commodity as quoted to-day, is apparently void of consideration.

The business of the telegraph companies begins to show an improvement over that of lately preceding months. This improvement has not been localized as to either section of the country or nature of industry, but has been very generally distributed. The increased number of messages arising from the better commercial conditions is quite marked and shows steady gains.

Reward of Merit.

Harper's Weekly takes no stock in the frequently-advanced theory that railroad presidents as such are selected to the office they fill because of favoritism due to riches. As a matter of fact, it says, the railroad presidents of this country fill the places they hold because of ability gained through long service, usually beginning at the foot of the ladder. If they have become wealthy it is as a rule because they have fairly earned their wealth. Many of them began life as common laborers or at a grade, closely related thereto. The paper cites a few instances as follows:

President J. A. Edson, of the Kansas City Southern, was a telegraph operator on the Lake Shore. President Underwood of the Erie, was a freight brakeman. President Earling, of the Chicago, Milwaukee and St. Paul was a telegraph operator. President Harahan, of the Illinois Central, was a member of a construction gang, and became its foreman as his first rise in the world. Theodore Shonts, president of the Clover Leaf, who was president of the Panama Canal Commission, and whose daughter married a Duke, began his career as water boy of a construction train in Iowa. President Garrett, of the Seaboard Air Line, was a messenger boy in the St. Louis Union Station. W. C. Brown, senior vice-president of the New York Central, was a telegraph operator. President Murray, of the Baltimore and Ohio, was a ticket seller in Texas. President Stevens, of the Chesapeake and Ohio, was an office boy and telegraph operator with the Baltimore and Ohio. President Newman, of the New York Central, was a freight clerk on the Texas Pacific. President Tuttle, of the Boston and Maine, was a ticket clerk. President Samuel M. Fenton, of the Alton, was a rodman in Pennsylvania, and President Smith, of the Louisville and Nashville, was a telegraph operator.

Hundreds of other instances might be given, not alone in the railroad world, but in other industrial fields, but enough has been cited to show something of the glorious opportunities that this country holds for men—real men! This opportunity, open to the poorest laboring man, is one of the greatest glories of American institutions. It shows that the declaration that high place is the reward of favor or dishonest dealing is a pessimistic, snarling lie. It proves beyond a doubt that honest merit wins in the long run, and that in this country, above all others, every man has his chance!

The International Electrical Congress.

The International Congress of the Applications of Electricity will be held at Marseilles, France, September 14 to 20. The Marseilles electrical exposition, which is now being held in the Prado Park, and will continue until October 31, is one of the largest exhibitions of electrical machinery and apparatus ever collected on the European

Continent, according to the Western Electrician, and the International Electrical Congress has taken advantage of this occasion for its meeting.

The sessions of the congress, which has for its purpose the examination of technical and commercial problems, will consist of reports and discussions by leading authorities on the questions up for debate. Many courtesies will be extended to attending members of the congress. French railroads and steamship lines promise substantial reductions in fares, and the freedom of the electrical exposition is granted to members during the convention.

Applications for membership in the congress may be made, accompanied by the equivalent of 20 francs (about \$4), by addressing the treasurer of the International Electrical Congress, 63 Boulevard Haussmann, Paris. Members will receive a complete report of the convention.

The programme of the sessions of the congress is divided into sections, which will treat such special subjects as the legal aspects of electrical operations, the construction and operation of electric lines, commercial and technical exploitation, applications of electricity to industrial, mining, traction, agricultural and domestic purposes, electrochemistry and metallurgy, telephony and telegraphy, standards and measures, and electrotherapeutics.

Among the well-known engineers who will present papers are the following, with their subjects: "Telephonic Communication Over Lines on Power Transmission Poles," G. Laporte; "Electrical Installation on Shipboard," Gaston Roux; "Electrical Illumination," A. Blondel; "Comparison of Traction Systems," Eduard Tissot; "Electrotechnical Schools," Paul Janet.

Important Patent Decision.

The United States Supreme Court has rendered a decision in a patent case, according to which the owner of a patent does not forfeit any rights under the same by withholding its use from the public. The case was that of the Eastern Paper Bag Company, which had sued for infringement of a patent of which it had not made use and had denied use to others. Among the arguments offered by the defense were that for an owner to neglect to use a patented invention and yet restrain others from using it was to violate the intent of the patent monopoly, the purpose of which is to promote the progress of the useful arts. The court, relying upon precedents, rejected this view, and held that the granting of a patent monopoly implies that the owner has an absolute property right in a patent.

According to this decision if an owner does not wish, for any reason, to work a patent, he need not do so, and can restrain all others from doing so during the life of the patent. In a dissenting opinion, Justice Harlan held that the prevailing opinion of the court was in conflict with public policy.—Electrical World.

The Filing Time on Messages.

EDITOR TELEGRAPH AGE:

The contention that the sender of a telegram is the person most interested in having the time when it is handed in for transmission included in or marked on the delivered message, seems rather strange. There may be times when, for special reasons, the sender wishes the receiver to know when a message was sent, but these times are exceptional and infrequent. In such cases the sender does not object to paying for the necessary additional words which are included in the body of the message.

It seems rather a preposterous assumption that the sender should usually have any special reason for transmitting the time when he hands in a telegram, because he knows the time himself and if he should desire to record it on the message blank, in the form of a memorandum not to be included in the message but only for possible reference at some future time, he can do so.

The sender does not care to have the time of sending transmitted, but he does desire prompt service. This cannot be enforced by having the time transmitted. His own evidence concerning that is sufficient to establish the fact and it would not be strengthened by having it in the form of a message. His interest is not so much in the time of sending as in the time of delivery, so it is not clear why he should be made to pay for extra words which he cares nothing about.

Receivers of telegrams frequently wish to know when they were sent. There are many reasons why this should be so. Sometimes it is important to know whether a particular message was sent before or after a certain hour. If there has been delay in transmission, there is no indication of it on the message delivered, and the fact ought to be made known.

The disposition seems to be to ignore or to belaud the real reason for the demand that has been made upon the companies that they shall mark the time when messages are received for transmission. If telegrams were handled more promptly there would be no reason for such a demand. It springs from the fact that one can sometimes travel by rail and arrive at his destination in advance of a telegram, and there is a widespread belief, founded on the experience of many persons, that telegraph business is not conducted with proper speed. Therefore the companies are being called to account in a manner they do not like; but it would seem to be the only way to effect the desired improvement. The writer once telegraphed in the evening from Wayne Junction, Pa., to New York City, saying that he was waiting for a train that was late. After waiting for the train and taking the trolley car in New York to his home, he arrived a few minutes after the telegram. He telegraphed about 9 A. M. from New York to an important town about forty miles distant, saying he would be there in time for dinner. Arriving about half-past twelve he was fifteen minutes later than the telegram. A special delivery letter was mailed in

New York for Philadelphia one day, and about the same time a telegram was sent to the same address. The special delivery letter won the race.

It is absurd for the companies to attempt to charge for the additional words giving the time. The movement is intended for their own good. Its real object is to encourage the companies to do business more promptly and they should not make any charge for such healthful stimulation.

ROMYN HITCHCOCK.

New York, August 8.

A Simple Duplex Telegraph System.

A simple duplex telegraph system is described by the Electrical Review in an article abstracted from a French electrical journal, in which, in addition to its simplicity, is independent of the weather conditions, there being no necessity to balance up an artificial line against the varying resistance of the transmitting line. The system requires at the sending station, two ordinary Morse keys connected in independent circuits between the line and the ground, each circuit including a battery. A third circuit connected in parallel with the two ground connections of the keys contains a resistance and a third battery more powerful than either of the other two. At the receiving station there are two receiving instruments, one of which is a simple sounder operated by a polarized relay responding to positive current impulses. The second is a similar sounder, connected, however, in the opposite direction, so that it responds only when its local circuit is broken. This may be accomplished by either of two relays, both of which are polarized. One responds to weak negative current impulses, and the other to strong positive impulses. In operation when either key of the sending station is closed it sends a relatively weak positive or negative impulse over the line, according to which key is depressed, and this impulse causes the corresponding relay at the receiving station to respond. Should both keys be depressed at the same instant this will send a strong positive impulse over the line, actuating, of course, the relay which responds also to weak positive impulses and that one in the receiving station would respond. To secure operating conditions it is necessary to have the battery which comes in operation when both keys are depressed sufficiently powerful to operate both relays. When one key alone is depressed this battery does not send an impulse over the line, because at that moment it is shortcircuited through a resistance and the other key, the potential thus thrown upon the line being insufficient to overcome the opposed working battery.

H. E. Wilson, manager of the Postal office at 184 Franklin street, New York, in renewing his subscription writes: "I wish you continued success with the Age, which is always interesting and instructive."

Telegraph Engineers in France.

The engineers for the French telegraph service are drawn from two sources. Major W. A. J. O'Meara, C. M. G., the head of the English telegraphs, in an interesting article in the *Post Office Electrical Engineers' Journal*, refers to these: first, officials of the postal and telegraph branches of the post office service; and, second, candidates having certain qualifications who are not connected with the postal administration. He further says:

Officers obtained from both sources have to undergo a course of instruction of two years' duration at the *École Professionnelle Supérieure des Postes et des Télégraphes*, Paris. Officers of the postal administration desiring to become engineers have to compete at an examination for admission into the *École Professionnelle*; they are nominated as candidates if they hold a good service record and are well reported upon by their superior officers. They must possess at least two years' effective service, and must be under thirty years of age on January 1 of the year in which the examination takes place; the entrance examinations are held once in every two years. The candidates have to undergo written and oral examinations in the following subjects: Written portion—Mathematics, four hours; mechanics, four hours; physics and chemistry, four hours; drawing, three hours; oral portion—mathematics, mechanics, physics, chemistry, and modern language (English or German); second modern language (other than English or German).

No candidate is allowed to take part in the oral portion of the examination unless he has first satisfied the examiners in the written portion of the examination. Bad spelling also disqualifies a candidate. The positions of the candidates on the competitive list are determined by the total number of marks obtained in the two portions of the examinations. The subjects mentioned, except the modern languages, are all compulsory. The whole of the marks obtained in each subject are counted for placing, with the exception that in the case of the modern languages marks equal to sixty per cent. allotted to these subjects are first deducted from those obtained, and the balances only are credited to the candidate.

Candidates for engineerships, who are not already serving in the postal administration, must have satisfied the requirements of the French law regarding military service, and must be less than twenty-six years of age on January 1 of the year in which they join the *École Professionnelle*. Their applications for admission to the school are addressed to the Under-Secretary of State for Posts and Telegraphs, and must be accompanied by, first, birth certificate, and, if necessary, letters of naturalization; second, certificate of good moral character; third, extract from sheet relating to offences tried in civil courts of law; fourth, certificate of good health from medical officer of the administration. This certificate must also state that the candidate has been revaccinated within

less than six years from date of application, and fifth, document proving that the candidate has fulfilled his military obligations.

The candidates not already serving in the postal administration, who are admitted to the *École Professionnelle*, are drawn from the students of the *École Polytechnique* who have completed the two years' course at the latter institution; they are not required to pass the examination for admission to the *École Professionnelle* already referred to, which only applies to officers serving in the postal administration.

It may be of interest to learn that although the *École Polytechnique* is essentially a military school, and a strict military discipline is maintained there, yet nearly all the civil engineers required for the service of the state are trained at this institution. Entrance to the *École Polytechnique* is obtained by means of a competitive examination open to young men between seventeen and twenty-one years of age, and as this institution holds a high reputation owing to the large number of eminent and illustrious Frenchmen who have been trained there, a large number of candidates of high attainments are attracted. Candidates for admission must possess a university-leaving certificate, and success at the entrance examination proves that the candidate has already obtained a wide range of scientific knowledge. At this examination mathematical subjects occupy a very important place, and considerable proficiency is also required in physics, chemistry and drawing. The aim of the school is to provide a very advanced scientific education. The subjects studied are differential and integral calculus, geometry, mechanics, thermo-dynamics, electricity, optics, acoustics and chemistry. The students after leaving the *École Polytechnique* receive specialized teaching in a number of schools of practical engineering, such as the School of Mines, the School of Roads and Bridges, etc.

All the candidates admitted to the *École Professionnelle Supérieure des Postes et des Télégraphes* are appointed "engineer-students," and receive a salary of £72 per annum, and the allowances provided for by regulations. The officers of the department who are admitted to the school retain the salary of the rank they hold, and they also retain, while at the *École Professionnelle*, any rights regarding promotion which they may possess in their class. These officers are also granted an allowance to cover their transfer to Paris, the maximum of which is fixed at £16.

The "engineer-students" have to undergo the instruction laid down for the "Second Section" of the *École Professionnelle*. The course consists of: (a) the theoretical and practical courses in the *École Supérieure d'Électricité*; comprising, general electro-technics; lectures on the application of electricity for traction purposes, etc.; continuous and alternating current generators; construction of electrical machinery; distributing systems, aerial and subterranean; accumulators;

electro-chemistry; practical laboratory work, including testing of machines; workshop practice; visits to electric works; preparation of scheme of electric lighting and power transmission; design of plant; calculations in connection with the design of continuous and alternating current generators.

(b) The courses and lectures special to the "Second Section;" comprising, application of statutory provision incorporated in the laws affecting the post office services; theory of electricity, and its applications to telegraphy and telephony; propagation of electric current in conductors, during its variable period, in relation to telegraphy and telephony; steam, heat and hydraulic machines; automobiles and railways; submarine cables; pneumatic tubes; construction of aerial and subterranean lines; course of architecture; strength of materials; postal materials; laws relating to workmen; machine designs.

(c) The courses common to the two sections of the school; comprising, general principles of telegraphy and telephony; construction of aerial and underground lines; statutory powers; general principles relating to administration and accounting.

(d) Practical studies and visits to places in France and abroad for purposes of instruction; comprising, manipulation on telegraph circuits; testing; English and German conversation and translation; visits to large telegraph and telephone offices; graphic representations; visits to district headquarters in France for study of industrial undertakings; visits to foreign countries for study of a postal, telegraphic or telephonic installation, and of an industrial undertaking; working out of a complete scheme of installation; laboratory exercises.

During the first year the application of electricity to industrial purposes is studied at the *École Supérieure d'Électricité*. During the second year the students attend the professional courses of instruction at the *École Supérieure des Postes et des Télégraphes*. Some of the subjects require a considerable knowledge of the higher branches of mathematics, and the necessary instruction is provided for those students who are able to derive profit from the same. A great part of the course in the second year is thoroughly practical in character: the students work out practical problems, signal messages, carry out electrical tests of apparatus and lines, visit important telegraph and telephone offices, go through a laboratory course and prepare projects for telegraph and telephone installations, etc.

The students have to furnish reports in connection with each of their visits relating to the courses of instruction and their papers carry marks which are added to those obtained at the examinations, the grand totals thus obtained determining the final classification of the students on completion of the course at the *École Professionnelle*.

At the end of the first year an examination is

held. It consists partly of written replies to papers, partly of answers to oral questions, and partly of practical tests. The marks obtained at this examination are carried forward to determine the final classification of the students.

At the end of the second year the students have to furnish a scheme relating to a telegraphic or telephonic installation, and also a paper on laboratory work (standardization, special study of a particular apparatus, etc.). The marks obtained again count for the final classification. In addition, a second series of examinations on the subjects on which instruction has been given, are held. These are also partly in the nature of written replies to papers, partly oral, and partly practical.

For a pass, students must obtain sixty-five per cent. of marks. Students drawn from the postal administration failing to satisfy the examiners are relegated to the positions they held when nominated for admission to the school, while those who were not formerly in the service of the postal administration are appointed to clerkships, and retain the scale of pay they may be receiving at the school. Students who fail at an examination may be allowed to present themselves for re-examination once only. The successful students are appointed second class engineers.

It is quite clear from this account that not only do the French telegraph engineers enjoy the advantage of receiving a thoroughly practical and wide training to fit them for their responsibilities, but that care is also taken that only those shall participate in the course of instruction in the *École Professionnelle* who have shown that they possess the energy to study and are likely to derive profit from the course of studies laid down for the "engineer-students."

It is further recognized that it is not possible for every young man in the post office service to acquire, without assistance, the necessary knowledge to take advantage of the education provided at the *École Professionnelle*, and in consequence, facilities are granted to officials desirous of competing for admission to the "Second Section" of the *École Professionnelle*, for study at one of the higher state schools at Paris, and, in some cases, at the university.

Love Your Work.

Only the fool speaks disparagingly of the work which his hands find to do, truthfully says the *Wall Street Journal*. And he is a genuine fool, because to speak or even to think so is to put obstacles in his own pathway. For our attitude towards our work is a decisive factor in its accomplishment. Therefore, to use the current parlance, be in love with your job. Take pride in it. Speak well of it, and it will speak well of you.

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

A British View of the Western Union Telegraph Company.

The Stock Exchange Gazette, of London, a financial journal devoted to the interests of investors, in a recent issue had this to say regarding the Western Union Telegraph Company: "This huge undertaking has paid dividends at the rate of 5 per cent. per annum on its capital stock without intermission since 1888, and has accumulated in the meantime a credit balance on profit and loss account of \$16,884,800. It has survived the financial storms which have played havoc with other industrial enterprises in the United States, and has dealt successfully with labor troubles which would have engulfed a less ably managed undertaking. Nor is this all, for the average toll per message has been raised during recent years from 30.9 cents to 33.7 cents, and though the latter figure is still far below the highest on record, namely, 50.9 cents in 1865-6, the upward tendency which has become noticeable since 1898 is a decidedly encouraging development. At June 30 last the company possessed 205,600 miles of poles and cables and 1,321,200 miles of wire; there were 24,760 offices, and 74,804,500 messages were dealt with during 1906-7, exclusive of those sent over leased wires or under railroad contracts. Receipts have advanced almost without intermission, and the total of \$32,856,400 for the year ended June 30, 1907, constituted a record in the history of the undertaking. This remark also applies to working expenses, a ten per cent. advance in salaries having come into force on March 1, 1907, and for this reason the net revenue balance for 1906-7 of \$6,324,200 was \$746,400 less than for the twelve months preceding. Nevertheless, there remained a surplus of \$36,000 to add to the sum brought forward, after meeting bond interest amounting to \$1,420,000 and \$4,868,000 representing the five per cent. dividend for the year. It is, therefore, unnecessary to emphasize the soundness of the company's financial position; nevertheless, it may be mentioned that stocks and bonds in other companies are held to the value of over \$23,000,000, and in addition the balance-sheet shows real estate \$5,088,000. There is a bonded debt of \$38,615,000, made up as follows:—Funding and real estate $4\frac{1}{2}$ per cent. mortgage bonds, \$20,000,000, due May 1, 1950; 5 per cent. collateral trust bonds, \$8,615,000, due January 1, 1938; while there is also \$10,000,000 of 4 per cent. gold bonds, redeemable at 105 on May 1, 1912, or any subsequent date of interest payment. They may also be converted, on terms to be fixed, but not less than par, into stock, and at the current quotation of about 80 this issue is undoubtedly a bargain, the yield being 5 per cent., while in the event of conversion or redemption holders will receive a bonus of anything over 20 per cent.

Symbols for Physical Quantities.

It is very desirable to have a notation for the representation of physical quantities in scientific books and periodicals which shall be the same in

all languages, says Miles Walker in the Electrical Review.

The subject is under the consideration of the International Electrotechnical Commission with a view to international agreement, and committees in the different countries (in England under the chairmanship of Lord Rayleigh) are discussing this particular subject. They are dealing more especially with symbols for electrical and magnetic quantities, but the system might with advantage be extended to embrace all important quantities in physical science, especially as the subject is receiving the attention of most technical societies with a view to some action being taken in the matter.

There are, however, two great difficulties which arise when we try to fix upon a standard notation.

The first is the difficulty of persuading a number of writers and readers who have become accustomed to a certain symbol for a certain quantity to change it in favor of an equally large number of writers and readers who have become accustomed to another symbol.

In the second place, there are not enough letters in the two or three alphabets at our disposal to give a distinct symbol to each quantity without resorting to the combination of more than one letter to form a single symbol. There is a great objection to this combination of letters because the use of sub-script letters and numbers is required for distinguishing between particular quantities of the same general kind.

There is, moreover, an objection to using letters at all to represent quantities in a universal notation because, unless initial letters are used, there is no connection in the mind between the letter and the quantity, and the symbol is difficult to remember. We can not always use initials because the initial letters differ in different languages. Moreover, the same initial occurs for a great number of different quantities.

One way of avoiding these difficulties would be to create a number of new symbols which could be printed by means of type like ordinary letters, and which would represent each physical quantity in a distinctive manner.

The question, however, arises as to whether a number of entirely new symbols would be acceptable to writers, readers and printers alike, and the sub-committee on symbols appointed by the British section of the commission has requested the writer to place his views publicly before the profession with a view of obtaining suggestions and criticisms as to the feasibility of such a scheme from as wide a circle as possible.

William J. Dealy, superintendent of the Commercial News Department of the Western Union Telegraph Company, New York, speaks of Telegraph Age in this characteristically genial way: "I know of no telegrapher, active or ex, who does not on arrival of *The Age*, immediately greet it as he would his best friend."

Bound Volumes of Telegraph Age Covering a Memorable Year in the Telegraph.

The year 1902 was especially significant in the annals of the telegraph, inasmuch as that date marked the accession to office of the present official heads of the Western Union Telegraph Company. The story as told in *Telegraph Age* distributed over the months of that year, chronicling the numerous changes that eventful period witnessed, is of interest, one viewed with importance by many as being of high referential value, furnishing data and dates nowhere else so readily available. A portrait of Colonel Robert C. Clowry, the incoming president and general manager of the company, and of General Thomas T. Eckert, whom he succeeded, as well as others prominent in the Western Union service, were included in the issues of the paper during that year.

In that year, also, occurred the death of John W. Mackay, the head of the Postal telegraph and Commercial Cable companies. His passing necessarily wrought changes in the great telegraph interests under his control, their direction descending as a possession to his son, Clarence H. Mackay, their present head. Full-page engravings of both the Messrs. Mackay also appeared.

It was in 1902, also, that *Telegraph Age* printed a comprehensive, instructive and illustrated article descriptive of the famous Buckingham Long Distance Page-Printing Telegraph, a chapter covering nine pages and of profound interest. Again, it was in this same year that the notable telegraph tournament, known as the American Telegraphers' Tournament, was held at Atlanta, Ga., when some well remembered records for fast sending were established, an event altogether of achievement of which telegraphers are proud and delight to refer.

Enough has been indicated to show that the year 1902 was an eventful one in the telegraph. The bound volumes of *Telegraph Age* for that year possess a special value. A few are on hand and are offered for sale at \$2.50 apiece. These will be delivered to any address in this country, carrying charges prepaid, on receipt of price. Address all orders to J. B. Taltavall, *Telegraph Age*, 253 Broadway, New York.

It is the Unexpected That Always Happens.

The visitation of a big black bear weighing in the neighborhood of three hundred pounds, making sudden and unbidden entrance through a window with a propelling force that would have done credit to a wandering meteor, was reserved for the experience of a telegraph operator of the Norfolk and Western Railroad at Juniper, Va., the other day. Mr. Bear and a rapidly passing engine of a train came in violent collision with the result that bruin was hurled into midair and sent flying into the telegraph office. The introduction thus effected did not lack dramatic features, of which it afforded a concrete example. It was

accomplished, too, with unerring directness, for the big beast struck the operator, who was sitting quietly at his key, with a loud concussion, and both fell to the floor stunned for the moment as a result of the terrific contact. It was a moment of astonishment; of that there was no doubt. Recovering their senses at about the same time the bear showed an immediate disposition to resent the indignity inflicted upon him. In fact, he was thoroughly mad. He was in no humor to make friends even with an inoffending telegraph operator, and as human sense was less aggressive in its methods, preferably choosing diplomatic procedure, so frequently resorted to in obtaining delay, especially when a safe distance from an enemy is to be encouraged, rather than risk an encounter as in this instance, with brute force at close range—besides following the wise dictum that discretion is the better part of valor, the operator managed to scramble out of reach, finding refuge and safety in the loft of the station in which the telegraph office was situated. Here he was forced to remain until a train crew sent to investigate the absence of telegraph signals from Juniper discovered the cause. Then, of course, the bear was forced to succumb to the cunning of superior human force and to yield up his life because he had followed but brute instincts.

Soldier Telegraphers in India.

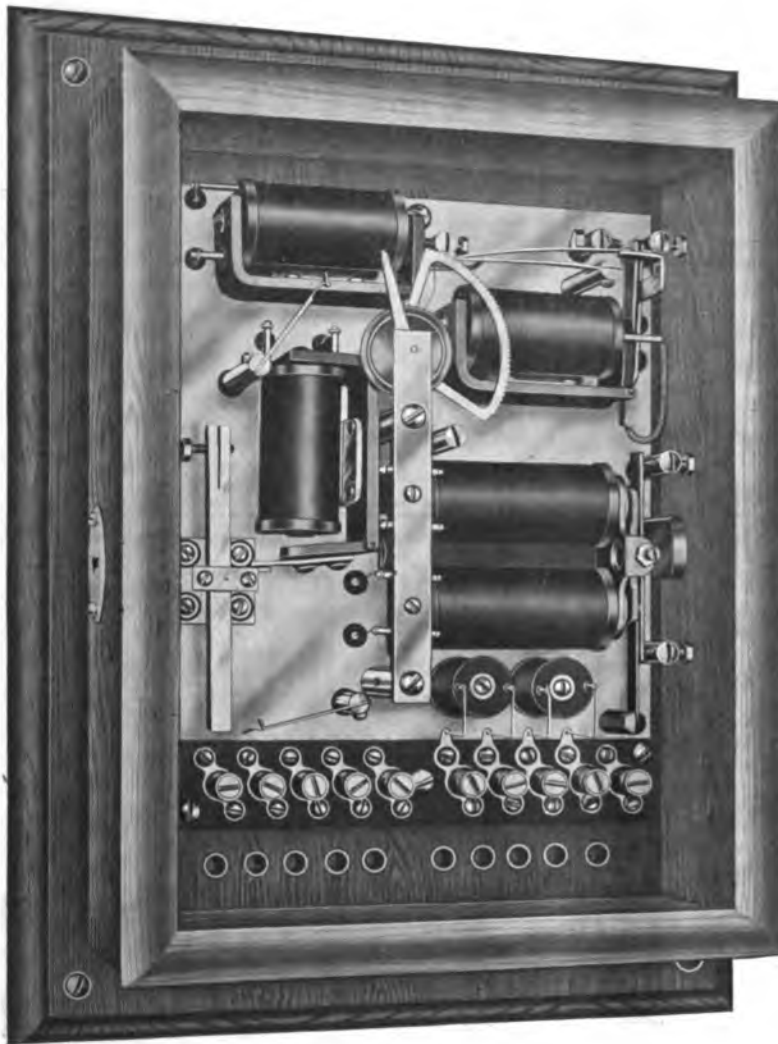
Among factors in the success of an Indian frontier expedition, such as that recently undertaken against the unruly Mohmands, the Indian Government telegraph department is by no means the least important. Bearing in mind the frequency of these little wars, it is, perhaps, small wonder that this service should have become thoroughly efficient, as it undoubtedly is. All calls made upon its resources by the military authorities invariably meet with a prompt response, and its organization is probably as perfect as it can possibly become.

In these expeditions soldier telegraphers are called into requisition, men who are not, like the English engineers, embodied in one regiment or corps, but are drawn from various branches of the Army—artillery, cavalry, and infantry. A certain number of young soldiers of good education, who are at the same time first-class shots, are trained as telegraphers. After passing an examination they are held exempt from all regimental duties, and are employed in the main telegraph stations throughout India, working about eight hours a day. This employment is supposed to be only of a temporary character, but, as a matter of fact, most of these men remain regularly employed for years. They are thus, when chosen for active service, thoroughly competent to carry out the duties allotted to them.

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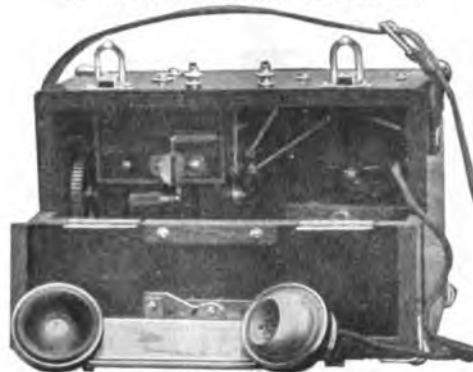


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For Old Time Telegraphers' and Historical Association

The Railroad.

Mr. F. A. Parker has been appointed chief dispatcher and division operator of the Missouri division of the Chicago, Rock Island and Pacific Railroad, with headquarters at Trenton, Mo., succeeding J. P. Quigley, resigned.

The substitution of the telephone for the telegraph in train despatching service is reported to be under consideration by the New York, New Haven and Hartford Railroad. The nine-hour law for telegraph operators, which has increased the payroll account and the payment of heavy toll charges for leased telegraph wires, are primarily responsible for the present consideration of the problem.

The telegraph plant of the extension of the Chicago, Milwaukee and St. Paul Railroad, now under construction from the twin cities to the Pacific Coast, will provide a system consisting of four through wires—two copper and two galvanized iron. In addition to connections for telegraphing, there will be a complete telephone service. The work is being expedited at different points. U. J. Fry, of Milwaukee, is the superintendent of telegraph of this road.

After a three week's trial the Delaware, Lackawanna and Western Railroad Company has decided that the system of despatching trains by telephone instead of by telegraph, has proved entirely satisfactory. At the present the telephones are operated by the telegraphers, but it is probable that, after the system is in thorough working order, there will be a considerable reduction in the number of operators. All trains passing between Scranton and Binghamton have been despatched by the telephone system, and not a single defect or mishap has resulted.

Interpretation of the Nine-Hour Law.

The suit referred to in our issue of August 1, brought jointly by the Pennsylvania and Lehigh Valley railroad companies in Pennsylvania, asked for an injunction to restrain the Interstate Commerce Commission from taking any further proceedings in pursuance of its order of March 3 to enforce the hours-of-labor law, alleges in its petition that the order of the Interstate Commerce Commission requires the railroads each month to make a detailed report of all instances where trainmen had been on duty for longer periods than the time prescribed by the act of Congress. The bill denies the power of the Commission to make such an order and alleges that the purpose of it is to get evidence to lay before the United States District Attorney in criminal suits, thus to compel the railroads to furnish evidence against themselves for breaking the law.

The Erie has entered a similar suit in New Jersey. The Baltimore and Ohio Railroad company has allowed itself to be enjoined in Maryland for violating the nine-hour law, and the case will speedily come to trial.

Chairman Knapp, of the Interstate Commerce Commission, and Commissioner of Labor Neill, constituting the mediation board under the Erd-

mann act, were in Chicago recently to confer with officers of a number of western railroads and the Order of Railroad Telegraphers with a view to effecting an adjustment of the controversy growing out of the interpretation of the nine-hour labor law. The act provides that a telegraph operator shall not be required to work more than nine consecutive hours out of twenty-four, except under stress of business conditions. Commissioner Neill does not believe that the differences offer any serious obstacle to a satisfactory settlement.

Officials of the Order of Railroad Telegraphers claim that the day is so divided that sixteen hours are worked continuously without violating the law. They say that this is true in the case of night operators. Many of the roads limit the day periods to nine hours, but work the night operators double the limit set by the law. It is charged that the superintendent of telegraph of one of the roads has divided the "tricks" so that the operators work three hour "splits" during twelve continuous hours. It is said that two operators are all that are required to do the work in one office supposed to be open twenty-four hours a day.

It is understood that the conference is to determine what interpretation shall be put on the law. The act provides that operators shall not be required to work more than nine consecutive hours. The modification of this rule is contained in a stipulation reading "unless unavoidable through business pressure and then only so long as no relief can be obtained."

Opportunities Afforded in the Railroad Service.

BY E. A. CHENERY.

Superintendent of Telegraph of the Missouri Pacific Railway.

[No one is better qualified than Mr. Chenery to write on the subject respecting the opportunities afforded young men in the railroad service to achieve business success. What follows was in reality a component part of a paper he read before the Association of Railway Telegraph Superintendents at Montreal, June 24, 26, but as it really furnishes a chapter by itself on an interesting question to which the remainder of his subject was but remotely connected, the matter is presented in separate form at this time.—EDITOR.]

It is generally admitted that of the present officials of our railroads, fully eighty per cent. started their career by way of the telegraph route; at the same time it is equally well known that no other avenue offers such an educational and sure journey to success, particularly in the operating, accounting or traffic departments, if proper energy on a sound foundation is applied.

No branch of the service is so full of promise to the young man fresh from school and with a desire to make for himself a name in the army of railroad workers, as is that of the telegraph department as a starter. This clearly is apparent to those who consider their opportunities rather than their comfortable convenience; who know that honest and unceasing endeavor must succeed and that slipshod methods and lack of interest cannot but fail.

The young telegrapher accepting his first position is in the Kindergarten class and cannot progress through the several grades to official position without constant and earnest application. He usually makes his entry into the service at some way station—on a branch road more than likely—where his duties consist principally in recording and reporting the passage of the few trains that pass his station during the hours he is employed. The actual labor involved is so small as to almost warrant the charge of extravagance for his meagre services, and were it not that his presence may be desired in a possible emergency, such as an accident or a disaster, there would be little reason for his position.

But the young man is engaged and we will admit is employed through no particular desire on the part of the management to be philanthropic. Let us see what his opportunities are: The actual work assigned leaves so much idle time on his hands as to permit him with profit to utilize many hours in perfecting himself either as a more proficient telegrapher or in familiarizing himself with the duties belonging to the agent or other employes at his station.

The art of telegraphy is not mastered in time measured by days, weeks or even months, and there are few telegraphers of to-day who will claim they earned the right to wear the title in less than from four to five years. This is partly due to the fact that in some cases after serving as an apprentice for from six to nine months and then securing a position, the temporary goal seemed to have been reached and continued effort is slackened on the theory, I take it, that there is no further necessity of running after the street car is caught. If advancement is desired and expected it surely must be deserved and the result can only be obtained after a supreme effort to perfect oneself is made.

Every telegrapher at such an initial station, has opportunities to practice many hours daily and to become acquainted with the various duties required of telegraphers more advanced and of the station and train work generally. He has access through passing telegrams to the best thoughts of his superiors and may be in close touch in advance of the press with the news and gossip of neighboring towns and cities and should be the best posted man in the village.

Ambition when accompanied by applied effort and recognized ability though suppressed, will not be permitted to tarry long in such a place, as the despatcher, the agent or some other representative will have observed the traits and qualities of merit manifested, and a summons in the way of an offer for a better position is forthcoming. The new position carries with it, more work, greater responsibility and opportunities for acquiring knowledge of the ticket, freight, accounting, commercial and railroad telegraph, express and other details and to become more closely identified as a part of the great machinery going to make up the large industry of a railroad.

As this knowledge becomes broader, a larger field is opened. An agency is offered, is accepted and the young man then becomes the road's one and direct representative and is usually regarded as the one person to whom inquiries of all sorts may be directed, with a reasonable certainty that a correct and intelligent reply will be received. Continued application and association through personal contact and correspondence with general officers and the patrons of the company has by this time added much to his education and self-reliance, and if his energy and temperament are cultivated further in the right path, success is now in sight.

Whether he be fitted to advance to the position of train despatcher, as an expert telegrapher in one of the more important offices, or to a more representative position among the people, in the traffic department, or from his association and acquaintance with the commercial world, he chooses to engage in other pursuits, the opportunity sooner or later is bound to present itself.

Of the eighty per cent. of railroad officials who began as telegraphers, by far the greater number are of the operating department. Train despatchers are advanced to chiefs, then to train masters and in succession to superintendents, general superintendents, general managers and presidents. In the front ranks of the traffic and accounting departments are many who started in the kindergarten class of telegraphy and worked their way through the position of agent, cashier, ticket clerk, etc., to traveling auditors, freight or ticket agents, to more responsible positions at the head of such departments.

Despatching Trains by Telephone.

[The following communication which appeared in the Railroad Age Gazette, signed by Wayne H. Graeff, of Harrisburg, Pa., is an interesting contribution by a practical railroad man who discusses phases of the prevailing question of train despatching by telephone from points of view at variance with those becoming so generally accepted.]

"I have read with interest the article, 'Despatching Trains by Telephone,' in the Railroad Age Gazette of June 26, particularly the paragraphs relating to the employment of young men who frequent railroad stations and the promotion of conductors to despatching.

"I am ready at any time my superiors see fit to do my despatching by telephone, and shall do it as conscientiously as by telegraph and have no fear that it cannot be done as satisfactorily. However, there are several questions arising in this connection that should have further consideration before embarking in telephone despatching. It should be noted that the Burlington used the best equipment to be had in installing its telephone system. Given a telegraph line with the same high-class equipment, would the telephone system then compare favorably with the telegraph? The telegraph lines are a fixture and it is notorious that nothing short of a sticky snow or

a cyclone will give us up-to-date equipment. Fortunately, the road I work for has an up-to-date telegraph system, but with railroads in general this is an exception.

"If I am correct, the operator on a telephone system hears nothing that occurs on the line until he is called to it by a bell. We pay operators to be 'on the job' and find that a good operator is 'on the job,' and not only listens for his call, but hears all that occurs on the telegraph line, no matter what part of the office he is in. When your operator hears nothing that is going on on the line he is liable to become an automaton. Again, the bell may be heard half a block away. Perhaps your operator will find it convenient to answer his calls from a pool room or the corner grocery. Suppose he claims the bell did not ring, has the despatcher the evidence from the rest of the operators on the line that he did call, as he has on a telegraph line? I have no doubt that it is easier for a despatcher to ring a bell than to call an operator in Morse, but I doubt if it is conducive of better results for his employers. A good despatcher considers his convenience as a secondary consideration when serving his employers' best interests.

"Again, is it possible with the system in use on the Burlington to have four or five operators receive an order simultaneously and check on each other's repeat without impairing the efficiency of the receiving instruments? I can picture a condition where a few trains waiting for orders are held up for their meets while a conductor gets to the telephone and holds a conversation with the train despatcher. Every despatcher has frequent encounters with crews who cannot see beyond the confines of their own train and who insist on having their way. Co-operation with the operators and crews is necessary, but let us not confound co-operation with familiarity. 'Familiarity breeds contempt,' and a man has ten times to think before he telegraphs a cuss-word, and can say it ten times on a telephone (before thinking) in the same space of time.

"I can readily see that the Burlington despatchers consider the new system a snap, as is stated. The equipment is all new, and as it has been in operation six months I presume they are still doing business with telegraph operators trained for the business. This brings us to the matter of securing telephone operators.

"The man who becomes a telegrapher has enough stability in his make-up to stick to it until he has learned the business, and while he is learning telegraphy he is also acquiring a railroad knowledge, without crowding that part of his education. I have lived in several country towns myself, and it is invariably the young man with no inclination for work of any kind that hangs around the railroad station. He has not the grit to learn a profession, and frequently does not finish his common-school education. Is this the young man to place in a responsible position to handle train orders? The establishment of railroad telegraph schools has aug-

mented the supply of telegraph operators, but it will be found that even they require two or three months' practice in a railroad office before they can qualify for a position. How many months' practice should a telephone operator have at this rate, and are there provisions for him to cut in on the circuit to get an idea of what he will be up against in real service?

"I can see no objection to promoting a conductor to train despatching—if he can fill the bill. The reflection on the despatcher of to-day should be met. The despatcher is no theorist at all. He handles a great many trains, of numerous classes and a variety of conditions affecting each of them. The conductor's view is confined to his own train and his ability to get that particular train over the lines. We will assume that the best conductor on the line has been put on a trick—despatching. As he is above the average he will expect too much of the average conductor, and will be working at cross-purposes. The train despatcher of to-day knows just what each and every crew he handles will do under different conditions, and in practice it will be found that he is promoted because he took an interest in train movements and despatching before his promotion. With the telegraph he has had opportunities to follow up all his despatchers' train movements and do some thinking for himself. This is hardly possible with a telephone line, as he would be neglecting other duties in order to cut in on the line.

"Personally, I was promoted from telegrapher to chief despatcher's chief clerk and then to train despatching, and am one of five despatchers who followed the same line of promotion and are in service to-day. This was a far-sighted arrangement on the part of the chief despatcher, and has proven the ideal education for a despatcher. As chief clerk, ample opportunity was afforded to view the work of other despatchers, to ride over the division and to work the train sheet, and I maintain that a greater part of this education could not be obtained under a telephone system.

"Admitting that the talent of telegraph operators is decadent, does not the same condition exist with trainmen? With our people conductors have been tried out on a despatcher's trick, and it is significant that all our despatchers in service to-day have risen from the ranks of telegraph operators. If a superintendent has ever been a train despatcher he will admit that his experience with train crews has proven that they rarely figure on more than one train—their own—while on duty; and I would ask which is the greater theorist, one who has heard the arrangements made and assisted in the movement of many trains day by day, or one whose experience is confined to the execution of orders necessary to get himself over the line? This question admits of a great deal of argument which I would leave to older and more experienced men, who, I am sure, will silently, if not in print, refute that 'theorist after all' idea."

"An Old Telegram" Arouses Reminiscences.

Orrin S. Wood, the veteran telegrapher, now over ninety years of age, and who in his earlier years (1847) superintended the construction of the Montreal Telegraph Company, with which he remained identified for eighteen years, most of the time as general manager, a system now merged with that of the Great North Western Telegraph Company, writes to *Telegraph Age* from his summer home at Turner, N. Y., regarding the reference to "An Old Telegram" appearing in the issue of July 16. His letter reads:

"The old telegram was from a small telegraph company (Toronto, Hamilton, Niagara and St. Catharine's Electro-Magnetic Telegraph Company), which we bought the year after I went to Canada to open the old and successful Montreal Telegraph Company. We paid three per cent. semi-annually to the stockholders the first six months after opening the line, and kept it up until we increased the dividends to four per cent. semi-annually, a rate which, I think, no other telegraph company succeeded in doing until several years later. The old company was the first to establish a uniform rate over all of their lines of twenty-five cents for ten words, notwithstanding our first lines were all built on highways. We were obliged to do a great deal of night work with only one set of operators, as so many trees were constantly falling on our wires, mishaps caused by careless choppers."

Mr. Sidney B. Gifford, of Syracuse, N. Y., also writes:

"Noting in the July 16 issue of *Telegraph Age* the story of "An Old Telegram," I beg to send you herewith a few old timers to add to your collection of relics of the early days. These papers are in nearly the same condition as when, from time to time, they came into my possession. Some had evidently been carried in the pocket of the former owner. Among them are four telegrams, each on a different blank form, and all dated earlier than that mentioned in the article in the *Age*. Please note the Rochester form is a sheet of note paper and was sealed with a wafer. A careful reading of the printed statement of about January 1, 1850, will reveal much of interest as to the situation in telegraph circles at that time. Many of the other papers will also prove interesting reading."

Included among the enclosures referred to by Mr. Gifford, was a letter dated at Utica, N. Y., May 31, 1851, and addressed to J. D. Stone, of the "Morse Telegraph Office," Syracuse, N. Y. It bore the signature of T. S. Faxton, president of the New York, Albany and Buffalo Telegraph Company, and was written in a small, neat hand, indicative of care and freedom from haste, on the large, square front leaf of a four-page sheet, of a pale blue tint, on which the name of the company was printed across the top in small, plain type. This was a "circular" letter, so indicated by that word being written on

the upper left-hand corner of the sheet, and was addressed with the conventional "Dear Sir." This communication was presumably sent in duplicate to all managers, at most few in number at that time, so that each received probably an original long-hand letter. All of which, both in form and method, presents a decided contrast from the procedure of to-day in sending out matter similar in character.

Mr. Faxton announced that as he contemplated being absent in Europe from June 1 of that year, for a period of three or four months, "the business of this company will be managed by Mr. Chapman, to whom you will make report of all business relating to accounts and money transactions, as fully as you would to me personally were I at home."

It was further stated that "Mr. Johnson, of the New York office, will have full charge of the operators' department, so far as the working of the line is concerned, and all operators will be subject to his directions in the performance of their duties as operators." The letter concluded with the injunction expressing the hope and expectation "that each and all of you will cordially and cheerfully comply with such regulation and system of working the line as shall most advance its success and the interest of the company, by a strict attention to its business, and most rigid economy in the disbursements necessary to carry on the business at your office, for on these everything depends for the future success of the line; and on my return I hope to hear of their having been no strife or contention amongst you, except a noble emulation as to who can best work and best agree."

A kindly letter, fatherly in tone, one such almost as the head of a household might address to his children.

The invention of the telegraph marked such a signal advance in the progress of civilization, introducing a new element in the means of communication, as to awaken much controversy during the earlier years of its history. Its real merits were called in question, even the true identity of its inventor was controverted, while savage attacks upon alleged high rate of charges were freely indulged in, contentions frequently marked by bitterness of expression and stimulated by feelings of jealousy. In a circular published about January 1, 1850, over the signature of "L. G.," and bearing the title of "The Telegraph Question," its writer comes to the defense of the telegraph. What he says is an interesting contribution to the literature of the subject. It is as follows:

The *Baltimore Sun*, animadverting upon the recent gross outrage upon the public credulity, in publishing the falsehood that Judge McLean, of the Supreme Court, had decided that Prof. Morse's patents were null and void, when the main case had not, in fact, been tried, and no decision had been given, says: "Among the most bitter and malignant opponents of Prof. Morse's interest and his excellent system and right of telegraphing, is the *New York Express*, which occasionally puts forth some most outrageous falsehoods in regard to the Morse lines.—What is the cause?"

The New York Express, malignant as it, indeed, has been, is not a sinner above all other newspapers in this matter; we might name many others, who are also acquiring with it a most unenviable notoriety in relation to the Telegraph, and we would whisper in the ears of these our contemporaries, that an indignant feeling now *deep*, but one that ere long will be loud, is universal among the intelligent classes of the community, who cannot but perceive the prejudice and sordidness which lie at the bottom of this persecution; the subject is scarcely ever alluded to without the exclamations, "It is a shame!" "a burning shame!" "a disgrace to the country!" But while there is no excuse for this shameful course on the part of these conductors of the press, it may admit of a species of palliation, but at the expense of the humiliating conviction of their having been made the dupes of one on whom they had relied for their information. In other words, they have been deceived. The promulgator of the falsehood in the present case, if not in many or most of former cases, appears to be Mr. Henry O'Reilly. A letter of his, published in the New York Express shows this conclusively. The original announcement of the falsehood appeared first in the Troy Whig, and then in the Express and other papers. Each of these two, however, upon being questioned in regard to their authority for such an announcement, apply to Henry O'Reilly for explanation, as their voucher. Called upon to substantiate his assertion that "Judge M'Lean had decided that Morse's patent is null and void," he unblushingly re-asserts the falsehood, in the face of proof adduced by him to prove what he asserted, but which directly proves the contrary. He quotes a letter from his counsel, Mr. Gillet, to whom he says he had written "to ascertain the facts beyond all cavil," and what does Mr. Gillet say in reply? "He," (Judge M'Lean,) "had made up an opinion, but had not pronounced it," and had consented to a reargument in July." Taking Mr. O'Reilly's own witness, then, he stands convicted of falsehood. He deliberately published to the world that a case had been tried before Judge M'Lean, and that "*he had decided Morse's Patent to be null and void.*" From other sources of unquestionable reliability, we learn the true state of this matter.

There are three suits instituted in Ohio against Mr. O'Reilly and others, by F. O. J. Smith, Esq., one of the proprietors of the Magnetic Telegraph. Mr. Morse is not directly concerned in these suits. Mr. Smith, not Mr. Morse, is the plaintiff. With regard to these suits, if the assertion made in Mr. Morse's letter to the Troy Whig, that *no case* had been tried before Judge M'Lean was *in any degree* an error, it arose from the following paragraph of a letter of the Hon. Senator Chase, one of Mr. O'Reilly's counsel, to Judge Smith, of New York, November 8, 1849. Mr. Chase says:

"As to the stipulation in regard to the Ohio depositions, it did not exactly meet my views and I was too busy to prepare one that would, so the matter was postponed. *It is now certain that the cases cannot be tried before next July so there will be ample time for an arrangement as to the testimony without one.*

Yours truly,

S. P. CHASE."

The error, then, was caused on Mr. O'Reilly's side, not on Mr. Morse's; but is it not in fact true that no case had been tried! A single point out of sixteen is not a case. A single point, to wit, the question, Is Morse's American Patent void because it does not bear date from the French Patent? has been under discussion before the Judge, and the argument "is not concluded," and "no opinion has been pronounced," "nothing is decided," and "the case is to be tried next July." One thing is absolutely certain: Judge M'Lean has not decided that Mr. Morse's Patents are null and void.

The Baltimore Sun asks: "What is the cause" of all this bitter and malignant feeling towards Prof. Morse? And well may it be asked; but its answer involves facts not much to the credit of the independence, impartially, or sense of justice of these presses. Their watchwords are, competition, no monopoly, exorbitance, extortion, reduction of Telegraph rates, cheaper telegraphing, &c., and so the end sanctifies the means, and individual rights, character, property, all

must be sacrificed that they may have their telegraph despatches cheaper. Disguise it as they may, this is the sordid cause for which the Baltimore Sun inquires.

And what reason is there in this outcry of exorbitance and extortion? Let us examine the matter.

Telegraphing for popular use is a recent thing. It originated with Professor Morse. He first invented a system that made it practicable, and he first carried in into successful operation. No one can dispute these facts. In the first organization of a new system for transmitting intelligence, where a rate of charges for transmission is to be established, whatever that rate may be, it cannot be called exorbitant, for the plain reason that exorbitance in this case implies comparison with other rates, and as there was no system of popular Telegraphs in the world, previously established, there were no other rates with which to compare them. Time, however, has produced other systems and rates of a similar character, and we can now make the necessary comparison.

The American system, as we have said, is the first that was ever popularized. England subsequently popularized her electric telegraph, and still more recently, Prussia, after careful examination of all other systems, has adopted and popularized Morse's telegraph, as the best presented to her consideration, adopting a rate of charges to suit her own exigencies.

We have now, therefore, three popularized telegraph systems in the world—the American, the English and the Prussian, and the charge of exorbitance can now be examined.

The Journal of Commerce, of December 11, 1849, in speaking of the news by the Europa, which was despatched to the New York press from Boston, says: "The despatch consisted of 3,930 words, the cost of telegraphing which was \$118." This despatch was sent over the Boston & New York line, a distance of 236 miles. As this line has a higher rate of charges than the average of the 40 other Morse companies, comprising over 11,000 miles of his telegraph, it is at least fair to our opponents to take this as the standard of comparison. Had the despatch consisted of 4,000 words, the cost would have been, according to the tariff of this line, \$120.

By the English Telegraph Tariff, 20 words cost one penny or two cents per mile, or one dollar for the first 50 miles; half a penny or one cent per mile, or 50 cents for the next 50 miles, and for any distance beyond 100 miles, one-quarter of a penny or half a cent per mile, being 50 cents each hundred miles beyond the first hundred for every 20 words. The cost, then, of the same despatch in England, would be \$418.

But it is stated in the foreign journals, that the Prussian Telegraphic Tariff is "double" in its rates "that of the English rates," consequently, the expense of the same despatch of 4,000 words, would in Prussia, be over \$800! The comparative cheapness or exorbitance of telegraphing can be summarily exhibited by stating:

American, Morse's system, 4,000 words, 236 miles.. \$120
English, Morse's system, 4,000 words, 236 miles.. 418
Prussian, Morse's system, 4,000 words, 236 miles.. 836

But even this startling result of the comparison is not all the truth. Among the most uncompromising assailants of the American Telegraph, those that have been loudest in the outcry for competition in order that telegraph rates may be reduced, are the New York Express, the New York Tribune and the Journal of Commerce. These three journals belong to an association of seven journals, associated to sustain the expense of their telegraphic despatches each bearing one-seventh of the expense, and participating equally in the same despatch; consequently, the expense of each for 4,000 words, is the exorbitant charge of \$17.14! Seventeen dollars and fourteen cents by the American telegraph for an amount of intelligence which would have cost them in England \$419, and in Prussia \$836!

*There is a mistake in reference to the tariff of the New York, Albany and Buffalo line in the above. An established rate from the commencement of this company, has been to charge full price for the first 100 words, and half price for all over; so that for 4,000 words, the regular tariff would be only \$61.57, instead of \$116.80, or about \$8.79 for each of the seven papers.

The same despatch would cost by the tariff of the New York, Albany and Buffalo line but \$116.80, or \$16.69 to each of the associated press.* If the expense in England were divided and borne by the associated press, the cost to each would be \$59.81, or in Prussia \$119.62.

We leave the reader to comment on the justice of the stereotyped outcry of exorbitance of American telegraphing.

But we have not quite done with these querulous gentlemen. It is but recently that the facts respecting the high rates of telegraphing in Europe have been announced in the American papers. May we not excuse them, therefore, for their ignorance, and believe that as honorable men, and patriotic withal, they took the earliest opportunity to acknowledge their error, and to sustain the superior advantages of the American system? Let us see. These papers give a paragraph which has "gone the rounds," stating, indeed, the enormous charges of the English telegraph, and then, (are we uncharitable in saying it?) lest their readers should turn upon them and ask the natural question, "how can you denounce the American telegraph rates as exorbitant after this?" they coolly add, "These enormous charges are the result of a close monopoly, which America is happily free from, through the competition of various inventors," leaving it to be inferred, of course, that although it may be true that we have cheaper telegraphing here, it has been produced by competition. Such a statement ought to bring the blush of shame upon their cheeks. If they were ignorant of a fact, the truth of which they might have ascertained in five minutes, and but a few rods from their offices, they are unpardonable in sending forth so injurious a paragraph; if it was wilful and wanton, still more unpardonable.

What are the facts? At the time of the publication of this untruth, there were in operation 11,607 miles or Morse's telegraph, under the direction of 41 companies. Of lines competing with these, only between 7 and 800 miles. This fact alone is sufficient to show that competition could not have produced the cheapness of American telegraphing. But it is a fact well ascertained that the original rates of telegraphing, rates established long before any attempt at competition had been made, or even threatened, are the rates of the several companies now, and if ever they are reduced they will not be reduced from the formidableness of any competition that has yet occurred.

The companies managing the telegraph have no motive for exorbitance in the adjustment of their tariff: they consulted their own interest in consulting the interest of the public; they established their rates with a just consideration of the interest of both; and the best proof that these rates are just is the fact that they have been unchanged from their original amounts by the above attempts at competition, and are the cheapest in the world.

Whether the rates on all the lines may not be reduced to the advantage of both stockholders and the public, is a question which can only be determined by a careful comparison of the amount of business done, and of expenses and receipts. If the business now gives constant employment to the line, the rates cannot, advantageously to the stockholders, be reduced: if the lines are unemployed any length of time, more than sufficient for the necessary rest of the operators, the rates can be reduced with advantage to all. This adjustment can be safely left to the discretion of the several companies, who have every motive which self-interest can suggest, to accommodate the public, especially if in so doing they increase their own gains.

The author fortifies his position by incorporating in his circular statement an "estimated cost of building a line of telegraph from New York to Buffalo," at which estimates, he says, responsible men can be

found who will be glad to take the contract for building such a line—distance five hundred miles:

Thirty posts to the mile, at an average cost of \$1.25, is \$37.50 per mile.....	\$18,750.00
Two heavy iron wires, say 600 lbs. to the mile, at 6¼ cents a pound, is \$37.50 per mile (much heavier than the wires now in use between New York and Buffalo....	18,750.00
Putting up wire, fixtures, etc., \$15 per mile (liberal)	7,500.00
Instruments, office fixtures and furniture....	8,000.00
	<u>\$53,000.00</u>

Add:

Ten per cent. for contingencies, although every allowance is liberal.....	5,300.00
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Amount carried forward..... \$58,300.00

Amount brought forward..... \$58,300.00

Use of patentee's right, with the privilege of buying a lawsuit in the United States courts, (large allowance), say..... 20,000.00
(Mr. Bain having repeatedly offered to sell all his title in the United States for \$30,000.00.)

\$78,300.00

Now, the cost of a line of telegraph, as proposed to be built by Mr. O'Reilly at \$275 a mile, 500 miles would be..... 137,500.00

Showing a difference of..... \$59,200.00

Which may be considered a pretty liberal allowance for the gentleman's disinterested patriotism in getting up a line that the public have no assurance can be worked after being completed, judgment against such lines of telegraph having been obtained in every instance where they could be brought to trial in Kentucky and Tennessee.

The cost of the present line between New York and Buffalo, built with heavy copper wire at 30 cents a pound, was \$180 per mile.

Then he goes on to institute a "Comparison of telegraph charges by the New York, Albany and Buffalo line, and those of some other lines in the United States," as follows:

New York, Albany and Buffalo Line.

150 miles, 10 words,	25 cents
300 miles, 10 words,	37 cents
506 miles, 10 words,	50 cents

Line from New York to Washington.

New York to Philadelphia, 89 miles, 10 words.	25c. 2c.
New York to Wilmington, 119 miles, 10 words.	35c. 3c.
New York to Washington, 245 miles, 10 words.	50c. 5c.

(Not half the distance that it is from New York to Buffalo.)

House & Bain's Lines.

New York to Washington, 245 miles, 50 cents for 10 words, and 5 cents for each additional word. (This is called the cheap line)—Opposition.	
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Eastern Line.

Boston to St. Johns, 445 miles, for 10 words....	\$1.00
Troy to Montreal, 278 miles, for 10 words.....	0.63

Mr. P. B. Delany, the electrical engineer and inventor, an old time and well-known telegrapher, who is summering at Nantucket, Mass., cannot apparently get along without Telegraph Age, for in sending to renew his subscription he writes: "A man without the Age is behind it."

TELEGRAPH AGE is the only telegraphic newspaper published in America. It is up to date, covering its field thoroughly, and no telegraph official or operator can afford to be without it.

America's Most Expert Telegrapher.

Mr. George W. Conkling, the well-known New York telegrapher, of whom so much is being said regarding his noteworthy feat in telegraphing over 80,000 words of press matter direct to the New York Sun office from the Democratic National Convention, during its recent session at Denver, Colo., is the chief operator of the entire telegraphic news bureau of that newspaper, otherwise known as the Laffan Bureau.

Working over a wire that stretched more than half way across the continent, about 2,500 miles, Mr. Conkling attained the high average speed of 3,136.20 words an hour, or 52.27 words to the minute, a record which has never before been



GEORGE W. CONKLING
America's Most Expert Telegrapher.

equalled anywhere for such extensive service, not even over short lines. To be exact, Mr. Conkling in just twenty-eight working hours sent over this wire to the Sun by the Morse system and using the Phillips Code, a total of 73,000 words, an average of 2,607.14 per hour. Much of this matter was sent from a seat in front of the Speaker's stand in the convention hall, while pandemonium was being raised, a severity of conditions telegraphers will recognize. Some of his greatest feats in transmitting are here enumerated: 14,750 words in five hours and twenty-three minutes; 8,100 words in two hours and forty-five minutes; 5,750 words in one hour and fifty minutes, and on the last day of the convention session the "clean up" matter counted up to 10,370 words transmitted in three hours and twenty minutes, an average of over 3,100 words per hour.

The receiving of Mr. Conkling's terrific rush was performed by Harry R. Clark on a typewriter. No breaks were recorded against Mr. Clark. The only interruptions were due to wire troubles of which the wire was almost entirely free, the weather conditions being almost perfect. The records both in sending and receiving were also marked by endurance as well.

Mr. Conkling has long been regarded as being

probably the speediest perfect Morse sender in the United States. He has participated in several telegraphic tournaments in which he has acquitted himself handsomely. In the Philadelphia tournament, in 1903, he won a silver loving cup awarded in a special contest to the most perfect Morse sender. On the same occasion he also successfully defended his title of champion code sender which he won in 1898, winning also the second prize in the Championship of America class. In winning fresh laurels in the field of actual work as a fast and most accurate sender, Mr. Conkling has been the recipient of many congratulations.

Mr. Conkling is still a comparatively young man, not yet thirty-seven years of age, having been born on December 22, 1871. He is a man of fine capabilities, of clean habits and of recognized force in telegraph circles. Learning telegraphy when but fifteen years of age, he has since pursued it both as a student and as an operator. He has been educated in all branches of the telegraph—railroad, commercial, broker, press and has had some experience in the fields of cable and wireless telegraphy, so that he brings to his present position as chief operator of a great newspaper an all-around training that is standing him in good stead.

The Old Time and Military Telegraphers' Re-union.

The joint re-union of the Old Time Telegraphers and Historical Association and of the Society of the United States Military Telegraph Corps, which will meet at Niagara Falls on September 16, 17 and 18, bids fair to attract not only a large attendance, but one signally representative in character. This will be especially true of the military telegraphers, for it is announced that among those expected to be present will be Colonel Robert C. Clowry, president and general manager of the Western Union Telegraph Company; Colonel William R. Plum, the historian of the military telegraphers; Charles A. Tinker, formerly general superintendent of the Eastern division of the Western Union; Colonel William B. Wilson, president of the society, and David Homer Bates, its secretary. All of those named had enviable war records, holding positions of much responsibility, the character of which is well-known to readers of *Telegraph Age*. Their meeting together on so auspicious an occasion as that of the re-union, when it is hoped many others, who also served with conspicuous fidelity and ability in promoting the cause of the Union in the department of its field telegraphy will be present to meet these leaders in social fraternization.

The officers of the Society of the United States Military Telegraph Corps are: Colonel William B. Wilson, Holmesburg, Philadelphia, president; William L. Ives, New York, vice-president; D. H. Bates, 658 Broadway, New York, secretary and treasurer. The circular letter sent out some-

time ago by Mr. Bates, addressed to comrades within his organization, before published in Telegraph Age, and which is once again printed herewith, has aroused much interest in the coming meeting, even among the old-time telegraphers, and many are looking forward to the coming event with eager anticipation.

Mr. Bates' circular is as follows:

Colonel William B. Wilson, our president, believing that our re-union at Niagara Falls this year should be a large and impressive one, will, with the assistance of the executive committee, use every effort to bring about that result. In view of this he has appointed the following committee to act in conjunction with the president and committee of arrangements of the Old Time Telegraphers' and Historical Association, whose headquarters are at Buffalo, N. Y.:

George A. Burnett, chairman; Joseph Anderson, Madison Buell, and Thomas A. Laird, Buffalo, N. Y.; James K. Parsons and Harry L. Gregg, Rochester, N. Y.; Joseph Schnell, Binghamton, N. Y.; George J. Goalding, Erie, Pa., and I. McMichael, Toronto, Ont.

It is desirable that your committee see that proper arrangements are made to the end that the dignity and importance of the historic services of yourself and comrades are fittingly recognized.

The officers of the Old Time Telegraphers' and Historical Association are: Harvey D. Reynolds, president, Buffalo, N. Y.; George A. Burnett, Buffalo, N. Y., I. McMichael, Toronto, Ont., and George F. Macdonald, Ottawa, Ont., vice-presidents; John Brant, secretary-treasurer, 195 Broadway, New York.

The official headquarters of the re-union will be at the Cataract-International Hotels, at Niagara Falls, a view of which is shown in the advertisement, published in another column, of this fine hostelry, which is conducted under a single management.

The programme of entertainment will be practically the same as that determined upon for last year, postponement of the affair at that time preventing its fulfilment.

John Brant, 195 Broadway, New York, the secretary of the Old Time Telegraphers' and Historical Association, will be pleased to answer any questions regarding the coming meeting.

LETTERS FROM OUR AGENTS.

With evidences of returning prosperity beginning to appear, indicating that the tide of business has reached its ebb, and that at last the flow may now be expected, it is hoped that the agents everywhere of Telegraph Age, with an aroused interest, will resume the sending of letters for publication in this journal. We cordially invite correspondence. The great telegraphic fraternity of this country, so closely akin, is interested in the coming and going—in the life of the profession, in the keeping in touch with the movements of individuals, so that space devoted to such a chronicle is, we believe, well dedicated to that purpose. It is hoped that excuses for non-writing offered by our agents on the plea that time will not permit such correspondence, will be brushed aside. Let us have a generous response. A presentation of facts occurring in numerous offices will make an interesting page, alike pleasing

to those whose contributions make it possible, and attractive to our great body of readers scattered broadcast over this country. The telegrapher in New York "wants to know" what his brother telegrapher in Chicago, in St. Louis, in New Orleans, in San Francisco, and other points, is doing and what he is interested in, and vice versa.

CHICAGO WESTERN UNION NOTES.

Miss Josie Kinsella, of this office, and Patrick McCarthy, of Litchfield, Minn., were married recently.

The death of Mrs. Louis Casper, on July 17, has caused a good deal of sympathy to be expressed for her husband an electrician of this company, who is well known in electrical circles throughout the country.

NEW YORK WESTERN UNION NOTES.

The recent death of the father of John F. J. Hopkins, assistant eastern wire chief, has caused much genuine sympathy to be extended to the son.

T. A. McCammon, chief operator, has returned from his outing passed in Canada, the land of his nativity. If a clear eye and a liberal coat of tan be accepted as an indication, Mr. McCammon must have spent a good share of his time in the open.

While it is true that many new faces are to be observed in the operating room, the fact nevertheless remains that a large percentage of old timers are still to be found busily engaged at the key, some of them with an experience dating back to cover a period of many years, occasionally twenty and even thirty being to their credit.

This is preemiently the vacation month, and a number of the chiefs and others are away seeking recreation at the seashore or among the mountains. As time limits expire and one after another returns, bronzed faces give abundant evidence of health recruited, and glowing accounts of out-of-door life, in which sailing excursions or valorous deeds performed in fishing on the recitals of many a leisure moment.

New York Items.

Mr. Dennis F. Brown, of the Western Union Telegraph Company, at Washington, D. C., passed through New York recently on his return from the convention of the Knights of Pythias, which was held at Boston.

The Magnetic Club Omits its Outing.

The Magnetic Club, of New York, gives publicity to the following resolution recently adopted by the Governing Committee: "That the dues for the current year be remitted, and the secretary be and hereby is directed to notify the members that while it had been decided to omit the regular summer outing of the club this year, the regular fall dinner would be held as usual."

Frank C. Mason to Welcome His Friends.

For many years Frank C. Mason, the well-known old time telegrapher, was a resident of Brooklyn, there holding for a long period the position of superintendent of police telegraph. Resigning two years ago, he retired to his country place, Glen Alex Farm, at Washington Mills, near Utica, N. Y. A view of his attractive home is shown herewith. As a municipal electrician and old time telegrapher, his connection with the re-



THE RESIDENCE OF FRANK C. MASON, WASHINGTON MILLS, N. Y.

spective associations of each remain unbroken. His friendships in both are many. As his place is situated on the direct line of travel to Detroit and Niagara Falls, the places of meeting selected this year for the two organizations named, he is opening his house at the time of both occasions to as many of his old companions, going or returning, who may desire to stop off and give him a call. Mr. Mason's hospitality is unbounded, and many no doubt will gladly accept his invitation.

Speedy Postal Operators at the Denver Convention.

EDITOR TELEGRAPH AGE:

In a recent article in *Telegraph Age*, reference was made to speedy work on press matter done by Western Union operators, by *The Associated Press* and by George W. Conkling. The reporter responsible for the write-up forgot all about the Postal, when Mr. Lawton of the Denver Western Union office had finished with him.

The Denver Postal did have stars of her own, and these were augmented by a dozen or more of the very fastest men in the business, brought in from Chicago and elsewhere. Roscoe Johnson, a Boston product, and as perfect a Morse sender as one ever listened to, sent six thousand five hundred words direct to the *New York Herald* in two hours and thirty-five minutes. Bernie Goethelp, recently of Memphis, and now with Logan and Bryan, Chicago, sent sixteen hundred words to the same paper in the incredibly short time of thirty-one minutes. Messrs. Bruckner, Simpson and Walsh, a Chicago trio, sent twenty-two thousand words to the *Chicago-Record-Herald*, in three hours flat. Copy was fed to them by Dave Hamilton, Postal manager at the Chic-

ago *Record-Herald* office, who was sent to Denver to look after his paper's interests, and there were spells when he ran out of copy. This gives the remarkable result of 7,333 words an hour, or an average of 2,444 words per man per hour. And it must be remembered none of these men were trying for records, simply moving the business as it came to them to the best of their ability.

With the Postal company at the convention were such men as W. R. Wilson, chief operator, of the Denver office of Logan and Bryan; Messrs. Muller, Stokeley, Kinley, and Ellis, of the same concern; Charlie Hinman, known everywhere as a wonderful operator, and a host of others, each of whom gave good account of himself. Every man was a brilliant operator, or he had no place in the Postal ranks at a time like the Denver convention when facilities were naturally limited and talent of the highest order demanded.

ONE OF THEM.

H. C. Wilson, Superintendent of the Jamaica, W. I., Telegraph System.

Mr. H. C. Wilson, of Kingston, Jamaica, government superintendent of telegraphs for that island, recently passed his vacation in this country, spending his time mainly in New York and Boston, Mass. He sailed on his return home from the latter place, August 8. Mr. Wilson, because of his long association with the telegraph has many friends, both in the commercial and cable services. He was born at March, Cambridgeshire, England, in 1854, and entered the telegraph service when only twelve years old, with the Electrical and International Telegraph Company. He went to the Midland Railway in 1868 as telegraph clerk, and joined the submarine cable service in 1870, serving the Eastern Telegraph Company at Alexandria and Suez, Egypt, until 1873. He joined the forces of the India Rubber and Gutta Percha Telegraph Works, going on the cable steamer "Dacia," early in 1873, and was engaged in laying and picking up cables in the West Indies until 1874, when he went to Pernambuco for the Western and Brazilian Telegraph Company. He left the service at Bahia in 1877, and retired from the cable field to go to Jamaica, where he married. Fondness for his old profession led him to accept from the British government an offer to construct around the island of Jamaica its first system of telegraphs. This was started in 1879 and has been gradually extended with the addition of a limited telephone system. There are about one hundred operators in seventy-eight public offices working "open circuit" over about one thousand miles of wire. The system is unusually well conducted. During the earthquake Mr. Wilson was precipitated from the second floor of his house into the cellar and sustained severe injuries to one of his legs. Many of the staff were killed and the offices were destroyed, but Mr. Wilson with wonted energy has put the service back into good condition, in spite of the difficulty of securing funds adequate to the work.

Mr. Wilson is a man of broad study and experience, and while in this country familiarized himself with the latest lighting and power developments. His health was greatly affected by the accident and by financial losses, but he has now thoroughly recuperated.

Obituary.

Donald Holmes, twenty-eight years of age, who was recently killed in an automobile accident at Bogata, N. J., was the son of the late W. J. Holmes, formerly superintendent of telegraph of the Erie railroad.

Colonel N. C. Pamplin, for thirty years manager of the Western Union Telegraph Company at Norfolk, Va., but who retired from active business two years ago, since which time he has been a resident of Philadelphia, died August 6, at Pamplin City, Va., whither he had gone on a brief visit. Col. Pamplin was born in the city in which he died sixty-five years ago. He leaves a wife and one son. In his profession he was one of the brilliant "old-timers" and had a remarkable war record. As the right-hand man of the chief of the Confederate telegraph service at the most important point, he discharged with signal skill and loyalty responsibilities which included custody of the most important war secrets of the Confederate Government. In Norfolk, Col. Pamplin had been a member of the Local Board of Brambleton Ward, a member of the School Board, and a member of the City Council. In all of these important capacities he served with characteristic ability.

Iowa's Incorporation Law.

The law under which the Western Union Telegraph Company is being sued in Iowa for \$898,500, is known as the incorporation law, and provides that a foreign corporation desiring to operate within the state shall pay a fee of \$25 for the first \$10,000 of its capital stock and an additional fee of \$10 for every \$1,000 of the authorized capital in excess of the \$10,000. Domestic corporations are similarly taxed, so there is no tax levied upon the non-resident which is not imposed upon the citizen corporation.

Furthermore in the case of non-resident corporations the law provides that each of them desiring to do business in the state shall file with the secretary of state a copy of its articles of incorporation together with a duplicate copy of the resolution passed by the corporation's board of directors requesting the right to do business in

Iowa. Failure to abide by the provisions of the law renders the non-resident corporation which does business there liable to a fine of \$100 a day for each day that it thus does business unlawfully.

Mr. Joseph Marshall, chief operator of the Western Union Telegraph Company, Savannah, Ga., expresses a high opinion for this journal. He writes: "Herewith is a money order for another year's subscription. My name has been on your books since 1883, and I hope to take Telegraph Age as long as I live. Your paper is gotten up in first-class shape, and is interesting from cover to cover."

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- Commercial Cable Company meets the first Monday in March, at New York.
- Gold and Stock Life Insurance Association meets the third Monday in January, at New York.
- Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.
- International Association of Municipal Electricians meets at Detroit, Mich., August 19, 20, 21.
- Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.
- Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.
- Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.
- Train Despatchers Association meets in 1909 at Columbus, O., at a date to be determined upon.
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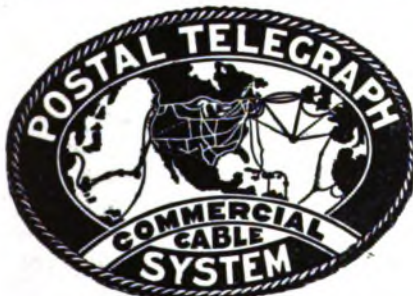
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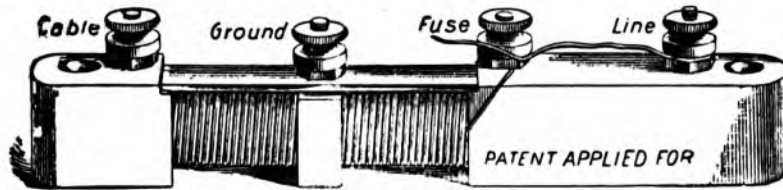
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