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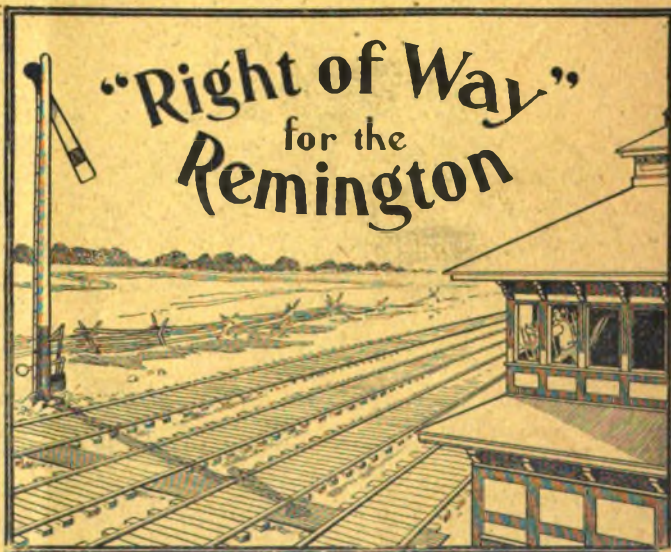
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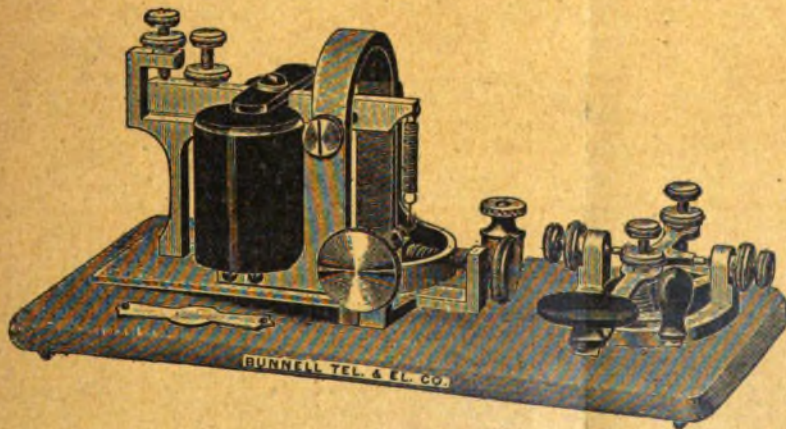


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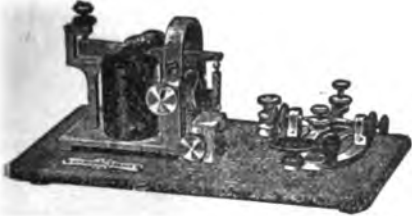
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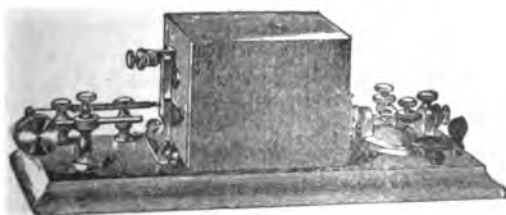
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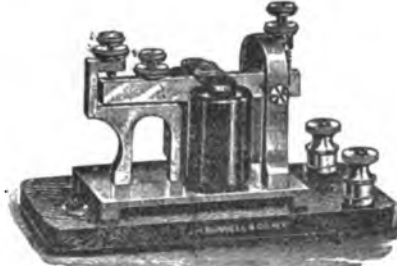
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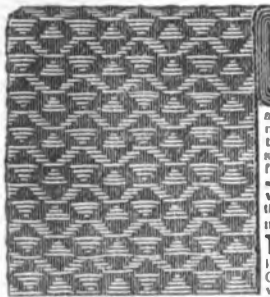
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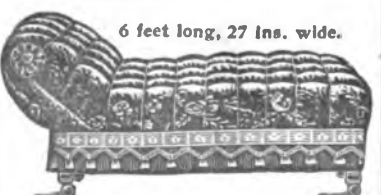
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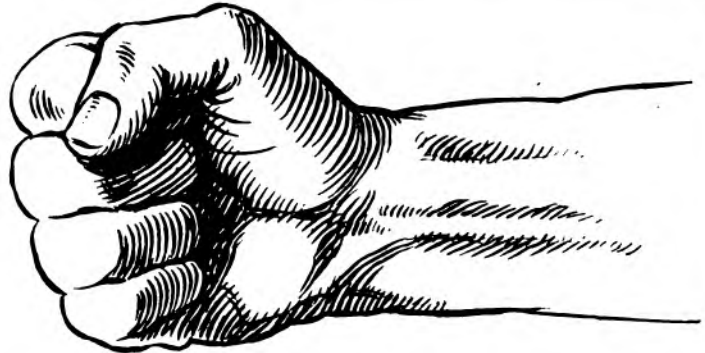
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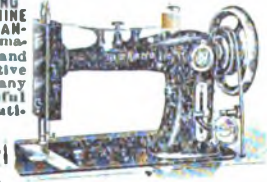
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THE TELEGRAPH AGE.

No. 1.

NEW YORK, JANUARY 1, 1901.

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

The Galvanometer—Continued.

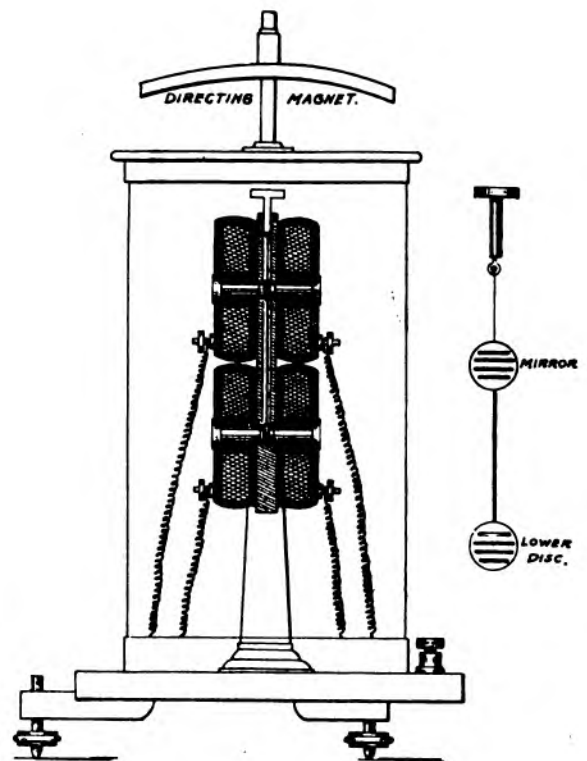
For ordinary wire testing the previously described tangent and the detector galvanometers, as well as several other similarly constructed standard types, give general satisfaction, but it not infrequently happens that the resistance of a conductor to be measured is so great that the strength of the current flowing therein is too feeble to deflect the needle properly; or, again, the resistance of a conductor may be so small that the result obtained must be given in thousandths or millionths of an ohm. The insulation conductivity of a long telegraph wire "open" at the distant end is an example of abnormally high resistance, while a few inches of thick copper wire will represent the other extreme.

It is presumed that the reader knows that as a matter of fact there is really no such thing as an "open" circuit of any considerable length. Despite all precautions taken to prevent the current reaching the earth at points other than at the legitimate "ground" at the distant end of the circuit, it does find many little side paths along the route (principally at the telegraph poles) by means of which it "escapes."

On a well-insulated line the resistance of each such avenue of escape may measure many millions of ohms, but the circuit is "closed" just as truly as if the wire was properly "grounded" at the distant end. A relay inserted in such a circuit will show no evidence of a current, for the same reason that the needle of the said tangent or the detector galvanometer may fail to be properly deflected, viz.,

because both devices are not sensitive enough. To meet this difficulty an extremely sensitive galvanometer has been constructed which employs a mirror, the purpose of which is to throw a beam of light on a scale situated some distance from the instrument. The beam of light takes the place of a pointer, and aside from the advantage of possessing no weight, may cover an extensive range over a long dial or scale, which latter in turn may be graduated into many small divisions.

Another happy feature of this pattern of galvanometer is that when the beam of light from the distant candle reaches the mirror, the latter reflects it back to the scale at an angle which to all practical purposes corresponds to the tangent of the angle of deflection; hence one reads directly



Thomson's Reflecting Galvanometer.

from the scale and is not bothered by having to refer to a table of tangents. One of the best known instruments of this kind is the Sir William Thomson (Lord Kelvin) reflecting galvanometer, the general features of which are shown in the accompanying diagram.

This instrument possesses four coils, two of which are situated immediately above the companion pair, while between the two are suspended the needles and mirror, which latter is the feature of the galvanometer. The small figure at the right shows the construction of the needles and mirror. Two small disks of light material are rigidly fastened to a common shaft, to which a fine cocoon

fiber thread is attached for the purpose of suspending the device from a hook immediately over the coils of the galvanometer. The astatic arrangement of the needle is employed—that is to say, the N—S needle of the upper disk opposes the S—N needle of the lower one.

Instead of a single needle for each disk, however, the latter possesses several very small needles, or short bars of magnetized watch spring each, about one-half an inch in length, but the two groups act as if they were simply two single needles. The needles are attached to the back of the disks, as shown in the small cut, and when under the magnetic influence of a current of electricity cause the disks to turn either to the right or to the left. The mirror is attached to the upper disk only. When a beam of light from a distant lamp strikes the mirror it may be reflected to any desired spot, as a mischievous schoolboy with a pocket mirror throws the sunlight in a companion's eyes.

In practice the mirror and scale are so arranged that when the coils of the galvanometer are free from a current of electricity the beam of light is thrown directly on the zero mark of the scale. The presence of a current turns the mirror, which in turn throws the light to the right or to the left of the zero mark, thus indicating on the scale the value of the current.

The curved piece of metal over the instrument is a magnetized piece of steel called the directing magnet. Its purpose is to control the needles and cause the beam of light to point to the zero mark when no current is present. Theoretically the directing magnet is supposed to point due north and south, but as its magnetic strength is so much greater than that of the earth's influence, it is not absolutely necessary to so arrange it. The directing magnet is capable of being raised, lowered, or turned to the right or to the left as may be desired; and foreign influences over the needle were originally intended to be corrected by thus shifting the position of the said magnet.

This galvanometer, however, is so sensitive to vibrations that the very act of shifting the directing magnet causes the beam of light to dance about in a very annoying manner. It has been found that a small bar of magnetized steel placed on the table near the galvanometer may be employed for the purpose of controlling the needles in a much more satisfactory manner. By merely shifting the piece of metal on the table from one point to another, the beam of light may be quickly brought to zero without the slightest jarring of the galvanometer or mirror.

Every precaution should be taken to guard the instrument from the annoying effects of vibrations of all kinds. The evil effects of the jarring of the building, due to the motion of elevators, slamming of doors, etc., are best eliminated by setting the galvanometer on a wooden base and attaching the latter, as it rests on the table, to the ceiling or other convenient points by means of small cords and rubber bands. The latter seems to take up, as it were, ordinary vibrations and permits the beam to rest steadily on the dial.

The Thomson galvanometer not only represents the most sensitive type of electrical testing devices, but furnishes the identical principle which led to and is to-day employed in one system of submarine cable telegraphy. The apparatus of the latter is practically a Thomson's galvanometer, the mirror of which reflects a beam of light above or below a certain straight line, according to the direction of the feeble charging current which is controlled by the sending operator. If the reflections above the line represent, say, "dots," and those below it "dashes," it is evident that a key which will reverse the polarity of the cable charging battery after the manner of a duplex pole changer, may be used in the usual way to make the alphabet, which will appear temporarily on the scale, letter by letter, in the form of dancing beams of light. These signals are read by sight and dictated to a companion, who writes them down as they appear.

(To be continued.)

KAISER AT A LECTURE.—Professor Slaby, of the Technische Hochschule, Berlin, Germany, lectured, December 22, in the presence of Emperor William upon his system of multiple wireless telegraphy, and made experiments showing the reception of messages from Charlottenburg, two miles west, and Schoenweide, eight miles east of Berlin, simultaneously. These messages were caught on the same lightning rod. Professor Slaby stated that the same receiving wire would serve for an indefinite number of messages coming simultaneously, while excluding all exterior currents that were not wanted. The Emperor listened intently, and after the lecture engaged Professor Slaby in earnest conversation for a half hour.

WHAT ONE FIGURE DID.—All the recent diplomatic tangle in Peking was caused by one little figure 1. The State Department cipher is all in figures, and when Secretary Hay cabled to Minister Conger to support the objections of the British Minister to the language of the note to China the cable company dropped one little figure 1. As it happened, this so altered the meaning of the dispatch that it made it read as if Mr. Hay were instructing Minister Conger to oppose the British view. This he did. Hence all the trouble.

The Telegraph in Africa.

A despatch from Durban, Africa, announces that the Cape to Cairo telegraph line is now in operation to a point fifty miles north of Katanga and a hundred miles beyond the southern line of Lake Tanganyika.

Under the terms of an agreement entered into in 1899 between the German government and the African Transcontinental Telegraph Company the line between Cairo and Cape Town must be completed within five years from that date. The distance from Cape Town to Katanga as the crow flies is nearly thirteen hundred miles. This is just about what remains to be done, for telegraphic communication between Cairo and Khartoum, a distance roughly estimated at 750 miles, has been assured since the downfall of the Khalifa.

Appointed General Superintendent.

Mr. L. D. Parker, general superintendent, Postal Telegraph-Cable Company, Chicago, Ill., owing to continued ill-health, has resigned and Mr. Edward G. Nally, assistant general superintendent of the same place, has been appointed as his successor. Mr. Nally has had eight years' experience in the office of the assistant general superintendent and is well qualified to perform the duties of his new office, which he assumed January 1.

Mr. Nally was born in Philadelphia, Pa., April 11, 1860. He commenced his telegraph career with the Western Union Telegraph Company as a messenger, at St. Louis, September 1, 1875. A year later he was promoted to be assistant bookkeeper. Later he was placed in charge of the city line business. In 1878 he was appointed to a clerkship in Colonel Clowry's office, then district superintendent at St. Louis, after which he filled several important positions in the service until 1882, when



MR. EDWARD G. NALLY,

General Superintendent, Postal Telegraph-Cable Co., Chicago, Ill.

he followed I. McMichael, who was Colonel Clowry's, and subsequently Colonel Baker's, assistant, to Minneapolis, Mr. McMichael having shortly before been appointed superintendent and placed in charge of the lines formerly the property of the Northwestern Telegraph Company. In 1885 Mr. Nally was appointed chief clerk to Superintendent McMichael, which position he filled until October 20, 1890, when he accepted the position of assistant to the general superintendent, Western Division, of the Postal Telegraph-Cable Company, which position he filled so very acceptably that he was made assistant general superintendent January 1, 1892. Mr. Nally is one of the most competent, faithful and hardworking men in the telegraph profession.

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

Bell Telephone Wins Royalty Suit.

Royalties amounting to millions of dollars are lost to the Western Union Telegraph Company by Judge Colt's decision at Boston, December 21, in the United States Circuit Court, in the suit brought against the National Bell Telephone Company, the predecessor of the American Bell Telephone Company, November 10, 1879.

The case, which was brought in the United States Circuit Court in 1883, was decided in favor of the defendant, the plaintiff's exceptions to the master's report being overruled, and the report of the master, who was the late Judge John Lowell, is sustained.

Their claim to royalties was mainly based upon a claim of twenty per cent. of the profits received by the defendant from its exchange business and that percentage of certain stocks which it received from various subsidy corporations which sprang up during the contract period from November 10, 1879.

The contract passed from the plaintiffs all their telephone patents and telephone business to the National Bell Telephone Company, which was succeeded by the defendant. Before the contract was made the plaintiffs and the defendant had been rivals and competitors in the telephone business, each claimed the right of exclusive control, and they were in long and expensive litigation. The object of the contract was to secure to the defendant the telephone business of the country.

The defendant, which was then known as the National Bell Telephone Company, agreed to pay to the plaintiffs twenty per cent. of all rentals or royalties received from licenses for telephones in the United States. The Bell company issued licenses to sundry corporations, and received, in addition to the annual rental for telephones, thirty-five per cent. of the capital stock of these concerns, and the plaintiffs claimed that this stock was "rentals or royalties" within the meaning of the contract, and that they were entitled to twenty per cent. of the stock and the dividends on it.

The defendant, whose contention prevailed, contended that the "rentals or royalties" mentioned in the contract were the standard annual rentals, less commissions, and nothing more. The exchange business was not in it, the defendant contended, as it claimed the exclusive right under the contract to carry on the exchange business and to receive the profits or to license another corporation to carry it on, receiving from such license a share of the profits.

The case turned on the construction of the words "rentals or royalties" in the contract. The contract was to pay the plaintiffs twenty per cent. of "all rentals and royalties actually received or rated as paid in accordance with the provisions of the contract from licenses or leases for speaking telephones."

This raised the underlying question of whether "rentals or royalties" included profits from the exchange business done by the defendant during the contract period, or referred only to standard annual rentals for telephones. The Court holds that

the contract clearly shows that the accounting contemplated by this defendant to these plaintiffs for telephones leased in the United States is strictly confined to rental of telephones, and does not extend to profits derived from the employment of the telephone in various ways.

Cable Companies' Statements.

The Mexican Telegraph Company, with a capital of \$2,000,000, reports gross receipts from 1881 to December 31, 1900, of \$6,165,489; net profits, \$4,531,303. Dividends paid amount to \$3,122,886, leaving a surplus of \$1,408,416, of which \$531,654 has been invested in the plant, such investment having been capitalized and issued to shareholders in full-paid stock, leaving a balance of \$876,762, which is represented in first-class securities and cash in bank. The operating expenses, repairs and renewals have averaged less than 27 per cent. of the gross receipts.

The statement of the Central and South American Telegraph Company for the six months ending December 31 is given as follows:

Previous surplus	\$576,845
Traffic receipts	\$420,202
Operating expenses	188,000
Net	232,202 .
Other income	5,600
Total net	237,802
Div. Oct., 1900, and Jan., 1901..	231,768
Surplus	6,034
Total	\$582,879

The Galveston disaster in September was severely felt by the company, cable repairs costing \$53,445. This amount has been taken from the surplus account, reducing that item, December 31, 1900, to \$529,433.

The company has a capital of \$8,000,000. The cables of the company, 7,500 miles in extent, have earned gross receipts from 1882 to December 31, 1900, of \$12,503,465; net profits, \$8,049,566. Dividends of \$6,203,932 have been paid, leaving a surplus of \$1,845,633, of which \$1,316,200 has been invested in extensions and improvements, leaving a net surplus of \$529,433. Operating expenses, repairs and renewals have averaged less than 36 per cent. of the gross receipts. The operations of the company for the year show a gain of surplus amounting to \$4,260.

Telephoning Under the Sea.

The Southern Bell Telephone Company has been conducting experiments at Key West, Fla., recently, to test the feasibility of transmitting the human voice under the Gulf of Mexico through the medium of telephones connected to a submarine cable. Tests were made by an agent of the Southern Bell Telephone Company, of Atlanta, Ga., through the courtesy of Manager Atkins, of the Interocean Telegraph Company at Key West, and were not entirely satisfactory. They demonstrated almost conclusively the impracticability of successful telephonic communication by cable.

Two long-distance telephones were used in the

experiments, one instrument being connected with a cable in the Key West office, and the other with the cable office at Havana. After repeated trials, the words "Hello" and "I don't understand you" were distinguished as coming from the operator at Havana, but all attempts at conversation proved fruitless, and the experiment was abandoned. Manager Atkins said that the voices sounded muffled and were merely indistinguishable, blurred sounds, as though coming up from some deep underground cavern.

He said that similar experiments were made some time since by cable connection between Dry Tortugas and Key West, which were equally unsuccessful.

Chicago Board of Trade and Its Quotations.

Officials of the Western Union Telegraph Company and the Postal Telegraph-Cable Company have stated that their companies have accepted terms imposed by the Chicago Board of Trade officials for renewal of market quotation service, excepting the exaction that these companies shall not be privileged to render market quotation service in Chicago, which privilege has been placed with the Cleveland Telegraph Company, a local ticker concern, and which, as President Warren is quoted as saying, is dominated by the Board of Trade.

Since the agreement reached with the telegraph companies new complications have arisen. Frank B. Riordan, a member of the Board of Trade, whose suspension has been talked of, has obtained an injunction restraining the Board of Trade from expelling him from that body and the two telegraph companies from discontinuing his quotation service. Mr. Riordan also charges the officers of the Board of Trade with jeopardizing the interests of its members, one of the charges being that President Warren endeavored to force upon the Western Union Telegraph Company at an extravagant price the plant of the Cleveland Telegraph Company. Mr. Riordan asks for an early hearing of his charges.

HOME FOR TELEGRAPHERS.—Paul W. Bossart, a well-known old-time telegrapher, was interviewed in Denver, Col., a few days ago by a prominent newspaper on the subject of a home for telegraphers. Mr. Bossart, who has taken a lively interest in the subject, is inclined to favor the plan embodied in the Childs-Drexel home for printers, located in Colorado, and he hopes that such well known old-time telegraphers as Andrew Carnegie and Thomas A. Edison will be induced to contribute to so worthy an object.

T. M. B. ASSOCIATION.—Assessment No. 373 has been levied to meet the claims arising from the deaths of Joseph W. H. Watson, of Newport, Del.; George Gerkin, of Marietta, O.; Verne M. David, of Buffalo, N. Y.; George W. Gardanier and John J. Daly, both of New York city.

The Oregon short line has installed a quadruplex system on its telegraphic line between Salt Lake City, Utah, and Pocatello, Idaho.

Block Signals.*

BY H. T. SIMPSON.

The principle of block signalling is so generally understood that it is hard to say much on the subject that will be new, yet I think it may be interesting to discuss the different methods in use on the railroads with which we are connected. Conditions enter largely in deciding what method is most suitable, and the Railway Association has adopted as standard three methods, defining them:

First: The telegraph block as one in which the signals are operated manually upon information by telegraph.

Second: Controlled manual block, in which the signals are operated manually and so constructed as to require the co-operation of the signalman at both ends of the block to display a clear signal.

Third: Automatic block, in which the signals are operated by electric, pneumatic or other agency actuated by a train or by certain conditions affecting the use of a block.

The first method has been long in use, but is thought to be weak in not having any check on the signalman. The second is, I think, the most desirable on a single track road, as it is necessary to protect both ahead and in the rear. This is the method in use on the road with which I am connected (Chesapeake and Ohio), we using what is known as the Leonard Electric Block machine, of which we have about one hundred and fifty in use. A brief description of this system may be of interest.

The two ends of the block, varying in length from three to five miles, are connected by an overhead single grounded wire. The machine is wired with two circuits, one through a magneto bell to earth, which is the normal position—the other controls a locking arrangement which prevents the semaphore signal being moved without the co-operation of signalmen at both ends of block. The movement is made by the signalman desiring to pass a train through the block, which station call A, signalling to other end of the block by magneto to unlock A's semaphore lever, in doing which B assumes responsibility of the track being clear at his end, which he is not likely to do unless it is clear. If the track is clear, he turns the switch, throwing the current from his battery on to the wire which energizes relay at A, releasing the lock of semaphore lever. This movement of the switch at B locks his switch, so he cannot make another movement until the train passes through the block and over a track box at B, releasing the switch. The switch when locked breaks the circuit, so that A could not unlock B's semaphore, even if he were asked to do so, while the train is moving from A to B. While the semaphore signal is set in clear position a telltale bell continues to ring until the signal is set back to danger, calling the signalman's attention to the position of the signal. The magneto signals can be made at all times and are used to report a train entering block, clear of block, etc.,

*Report read at the Convention of Railway Telegraph Superintendents at Detroit, Mich., June 20-22, 1900.

instead of using the telegraph line for such reports. On the Chesapeake and Ohio road the machines are operated by the telegraph operators, although the signalman does not necessarily have to be a telegrapher, and being coupled to regular signal levers require no extra work.

They are economical as to first cost and in maintenance, the batteries being in use for such short periods that they last from eighteen to twenty months. Our telegraph linemen look after telegraph and signal wires on about ninety miles of road and twenty-five to thirty machines. The parts being very simple, there is seldom any failure, and if one occurs it is generally found in the battery, caused by a broken jar or rusted connection; and what we think is a good thing is that an operator or signalman knows whether or not the apparatus is in working order, whereas with automatic signals the train coming to signal at danger cannot be sure if it is by reason of a train being on the block or because the apparatus is not in working order, they being arranged to show danger signal when train is in block or when circuit is out of order. The trainmen like our system, feeling sure when they get a clear signal that the block is clear. Our officials feel that the system is a great safeguard in moving trains. It is conceded that there has never been an accident that could be charged to the machines since their installation some four or five years ago, and that they have prevented accidents that would probably have occurred without them.

We have three or four blocks equipped with the staff system. This is a very safe method, though its first cost is considerable. It is also a manual controlled system, requiring co-operation of signalmen at both ends of the block, and the stations are connected by an overhead wire. Each machine has a number of staffs locked in. To pass a train through a block, signalman at A asks B to unlock the machine so he can get staff (which is a key). After one staff has been taken out, another staff cannot be gotten out of the machine at either end, owing to the direction of the current being changed in removing the staff; after taking the staff out of the machine and using it to clear signals it is given to the train to carry to the other end of the block and deliver to signalman, who puts it in the machine, changing the direction of the current again and making the two machines work in harmony, thus allowing another movement of trains to be made.

Automatic signals seem to be generally used on double track roads. On such roads with heavy traffic and short blocks, the conditions are good for such system, and I understand that in practice the system is used mainly for spacing trains, the rule being for trains to wait at the block signal, if it shows danger, from two to five minutes, and then proceed. I read of a discussion as to whether it was necessary for trains to wait any time or proceed at once after observing that the signal showed danger. This system I do not think recommends itself for single track blocking, which should be absolute.

I have not had much experience with bonded track circuits, but what I have had leads me to be-

lieve they are expensive to maintain in satisfactory condition, consequently my preference is for a system of blocking connected by overhead wires.

Telegraphing and Telephoning Simultaneously.

The Rysselberge system of telegraphing and telephoning simultaneously over a single wire is meeting with considerable success in Germany, according to the *Scientific American*, the Berlin fire brigade being equipped with it.

There are fifteen brigade stations in Berlin, each of which is served by a special network of fire alarms. From these stations underground wires radiate in all directions, each wire being connected with a great number of alarm pillars. The alarms are arranged for automatic working, and to each is fitted a key for telegraphing to the station. As it is, however, a very great advantage to be able to maintain during the progress of the fire a good connection between the alarm pillars nearest the fire and the brigade station, exhaustive trials have been made with a specially adapted telephone which have resulted in the general introduction of the same. To the Morse apparatus at the station a stand is attached, from which a microtelephone fitted with a battery switch and a second receiver are suspended. The remaining apparatus is inclosed in a flat box and placed under the table. This box contains an induction coil, a condenser, and a circuit key. As it would be expensive to equip each of the fire-alarm posts with telephone apparatus, a portable set is used, which may be attached to the posts by means of a plug and socket provided for the purpose. Such a portable set is carried by each of the brigade carts, there being some eighty now in use. The brigade's cycles are also equipped with sets which are very compact in design. Experience with the system has shown that the switching in of the telephone apparatus in no way influences the telegraph service. During simultaneous telegraphing and telephoning a slight knocking is perceptible in the telephone, which, however, does not destroy the audibility.

Business Notice.

The Montauk Multiphase Cable Co., of New York, lately secured the handsome contract to install their system of fire protection on the new piers and terminals of the North German Lloyd Steamship Company to be built in Hoboken, N. J., when last June its property was destroyed by fire. The plans call for the erection of a substantial structure 850 feet long facing the river, besides additional buildings, each considerably over 800 feet in length, covering the three piers that are to be built outward from the first named construction. The precautions to be taken against fire will be most elaborate, the specifications calling for the complete equipment of the entire property with the fire detecting wire of the Montauk Multiphase Cable Company. Besides permanent installations, the permanent and portable reels have also been adopted for distributing the wires over merchandise on the docks.

Subscribe for TELEGRAPH AGE, \$1.50 per year.

The World's Queerest Line of Telegraph.

Up in Alaska men are at work putting up the most extraordinary telegraph line in the world. It is a line designed to connect the Cape Nome-St. Michael cable with the various mining camps up the Yukon River. There is no timber in the country through which this telegraph line will pass, and steel poles have to be used. Also there is no earth in which to set the poles. The country is largely tundra land, covered with moss, but it is necessary only to dig down a little way through the moss and one comes to the eternal ice which never melts. A hole is cut in this ice, the pole is imbedded in it, and water poured into the hole. The water quickly freezes, thus firmly fixing the pole in position, where it will remain for untold years if not disturbed, for the new ice takes on the character of the old and never-melting ice in which it has been formed. Winter was chosen for the setting of the poles and stringing of the wires because the snow gives good sleighing facilities and the cold is necessary to the formation of the ice-sockets in which the poles are set.

People of less ingenuity and perseverance than the Yankees would have given up the attempt to build a telegraph line across this country when it was found that there was no earth in which to set the poles, but the Americans decided upon the ice setting almost as a matter of course, and did not seem to think they were doing anything especially brilliant. This line is being built by the Government.

The laying of the cable across Norton's Sound was itself an example of the resourcefulness of the American. The cable steamer *Orizaba* ran aground soon after leaving St. Michael, but there was no thought of giving up the job on that account.

George F. Porter, who was with the expedition, tells in the *Electrical Review* of the manner in which they overcame such a mere incident as the wreck of the cable steamer. He says: "The ship rested easily, but it did not take more than a hasty examination to show that she was badly damaged. The question then was to save the cable and, if it was humanly possible, to lay it anyhow. A lighter was secured and a small ocean-going paddle-wheel steamboat to tow it, and the cable was pulled out of the hold and coiled on the lighter's deck, the weather, for a marvel, holding good all the time. The lighter was rigged up with a small jockey block on the end of a beam from its short mast, and through this the cable was passed. Luckily we had enough cable, for the combination of paddle-wheel steamboat and lighter steered somewhat irregularly, and the cable now lies at the bottom of Norton Sound in a sinuous line, far different from the straight course that it would have had had the ill-fated *Orizaba* not perished on the reef. However, the cable is laid and is now in operation. The work being finished, we had to take what transportation we could get, and our party finally secured quarters aboard a tramp steamship, at that time doing a thriving passenger business between Alaska and American points. The journey back in that ship was something good to

look back upon as an experience, but bitterly disagreeable while it lasted. Provisions were very short, and a strange vessel had to be stopped in the solitudes of the Pacific Ocean to supply us with food. The water on board the ship, if boiled and mixed with vinegar, could be drunk by a man if he was very thirsty. Among the other supplies that we received from the friendly vessel that came to our assistance was a case of Apollinaris water, for which the demand was so strong that it retailed at \$6 a quart bottle. We found out, however, that when it rained, as it frequently did, we could hold, three of us, a rubber coat with the sleeves turned wrong side outwards, one man holding the lower end of the sleeve, and thus painfully gather a sleeveful of water; this we bottled in the empty Apollinaris bottles, and in this manner managed to slake our thirst somewhat until we reached Seattle. We were comforted, though, even in this unpleasant passage, by the knowledge that we arrived at Seattle with the Cape Nome cable in good working order, despite the continued series of accidents that threatened to prevent its installation."

News Gathering.

Melville E. Stone, general manager of The Associated Press, was tendered a reception and banquet at the Algonquin Club, Boston, on Tuesday evening, December 4, and during the post prandial exercises he entertained the members and guests with a "talk" on the evolution and growth of The Associated Press and of similar organizations throughout the world.

General Charles H. Taylor, after some felicitous remarks anent the struggles of the guest and himself in their early days in the newspaper business and later in competition with each other, introduced Mr. Stone, who was given three cheers and a tiger.

Mr. Stone began his "shop talk," as he called it, with a brief resume of what printing and newspapers had done for civilization from the fifteenth century to the beginning of the nineteenth.

It was between 1835 and 1845, he said, that the newspaper business in the United States entered its renaissance period, and since then the great era of intercommunication by steam and telegraph has brought the newspaper business to its present perfection, and has made of The Associated Press such an important agent in the newspaper world.

About 1835 the elder James Gordon Bennett started his paper in New York, followed by the Sun and the Tribune, and from the office of the Sun three young men started south to organize—one a paper in Philadelphia, another in Baltimore and the third in Charleston.

The newspaper of to-day was born in that period, largely because of the removal of the tax on paper and the invention of the cylinder press by Robert Hoe, added to the tremendous personal energy of the three men who started papers in New York during the period.

Two of these men were fathers of different types of journalism, and one of these types is fast pass-

ing out of existence, while the other is moving on. James Gordon Bennett was the apostle of the great modern newspaper which aims to give all the news possible, and Horace Greeley was the apostle of public opinion only—he aimed to lead and guide public opinion in his paper. It had its day, was powerful and did good, but that kind of journalism, which aimed to mold public opinion, has passed away.

Bennett held that the highest purpose of a newspaper was to give the news, and early in his career he made arrangements to meet the incoming steamers and get the foreign news from them into his paper as quickly as possible. He aimed to give truthful information on all current events.

He employed a series of post roads before the era of the telegraph, and got his news from Washington in this way. Later other New York papers adopted the same plan, and this finally led to an arrangement by which this news should be sent through one channel for a number of the New York papers.

This was the birth of The Associated Press idea. This preliminary organization exchanged the routine news from Washington and elsewhere with papers in other localities on consideration that these papers should in return supply local news from their localities.

Later this principle was worked over a large territory, and the New York association charged a money bonus in addition to the news exchanged.

The invention of the telegraph made possible the further extension and perfection of this idea, and after a period of travail, during which there were a number of associations conflicting one with the other and fighting each other, The Associated Press of to-day, which practically includes all the papers of any consequence in the entire country, was born.

Mr. Stone then described at some length the methods by which the news of the country is gathered through The Associated Press and its agents, showing more particularly how in the United States the representatives of the organization have access to all the newspapers connected therewith, and consequently are able to get the news fresh and wire it to the different points all over the country, thus furnishing the editors of all papers a budget of the important news of the day as far as this country is concerned.

He then showed how the foreign news is gleaned through independent European agencies established by The Associated Press at principal points and through arrangements with the principal foreign agencies. To emphasize the perfection of this system he pointed to the reports of the Dreyfus trial each day and other foreign matters of recent interest.

He explained the difficulties The Associated Press had to contend with during the Spanish-American war and up to the destruction of Cervera's fleet. He eulogized the work of the war correspondents engaged during that war, many of whom, he said, did work which outrivalled the bravest work done by the soldiers on the field of battle.

He concluded his remarks with the hope that the day was fast dawning when the little tattle of life would receive less attention in the newspapers and when the higher and better things which enter into the history of the world will become the real news.

The System of the National Magneto-Electric Telegraph Company.

In Room 704, Park Row Building, New York city, there are on exhibition instruments illustrating a new system for transmitting signals of all kinds, including telegraphing by the Morse code. Briefly, the system consists in the use of induced currents of high potential, generated by a modified form of a magneto, and were we to stop here, all telegraph men would smile and say "Ancient as the hills."

Many inventors have, during the past forty years, endeavored to invent some way of utilizing the known high potential that may be generated by means of a magneto, so as to put it into practical use in the art of telegraphy, but they have all failed, primarily for the reason that none of them ever thought of taking advantage of the inductive effect gained by suddenly bringing the rotating part, or armature, to a standstill at the proper point in its revolution where the high inductive effect of the sudden discharge of the armature coil could be obtained. Mr. L. G. Wooley, an old-time telegrapher, seems to have solved this problem in a manner so simple and effective that it causes the visitor to rub his eyes and ask if he is dreaming.

The particular instrument of most importance to our friends interested in telegraphy is the simple telegraphic instrument shown, which is capable of transmitting the characters of the Morse code with perfect accuracy, through a line, with resistance introduced sufficient to make the whole equivalent to a resistance of 12,000 ohms. This instrument consists of a series of magnets, provided with suitable pole pieces, between which a small armature wound with very fine wire is made to revolve by means of spring mechanism at a very high rate of speed for one-half a revolution, when it is suddenly checked by means of a lug on the end of the armature coming in contact with a shoulder in a slotted key, this movement being caused by the depression of the key, and a like movement is produced when the key is released; thus, one can transmit the ordinary dot and dash of the Morse code with the same facility as with the ordinary telegraph instrument.

Wherein this system differs from all others heretofore attempted is in the creation of very high potentials on both the up and down stroke, and by means of which batteries, or heavy dynamic currents, may be eliminated, and at the same time this system permits of telegraphing long distances without any relay or repeating device.

Should this device prove as successful in practical operation as there is every indication that

it will, it will not only prove a boon to the practical telegrapher, but will doubtless effect a large financial saving to the companies employing this system.

One great beauty of this system is that its instruments, inasmuch as they have no contact points to be corroded and eaten away by the making and breaking of the current, are always ready for action. The practical telegrapher will fully appreciate what this means.

This same principle is, as may be readily seen, applicable to all other forms of transmitting signals, and the company have on exhibition a complete fire alarm telegraph system, as also a very ingenious device for automatically testing the circuit for breaks at intervals of every two and one-half minutes, which may be made, however, as often as desired. This tester can be used on all kinds of circuits, telegraph, telephone, fire alarm, and in fact any system of wires whose continuity at all times it is desirable to preserve.

The system is so extremely simple that it seems remarkable that its discovery should have been deferred to the very closing years of the nineteenth century.

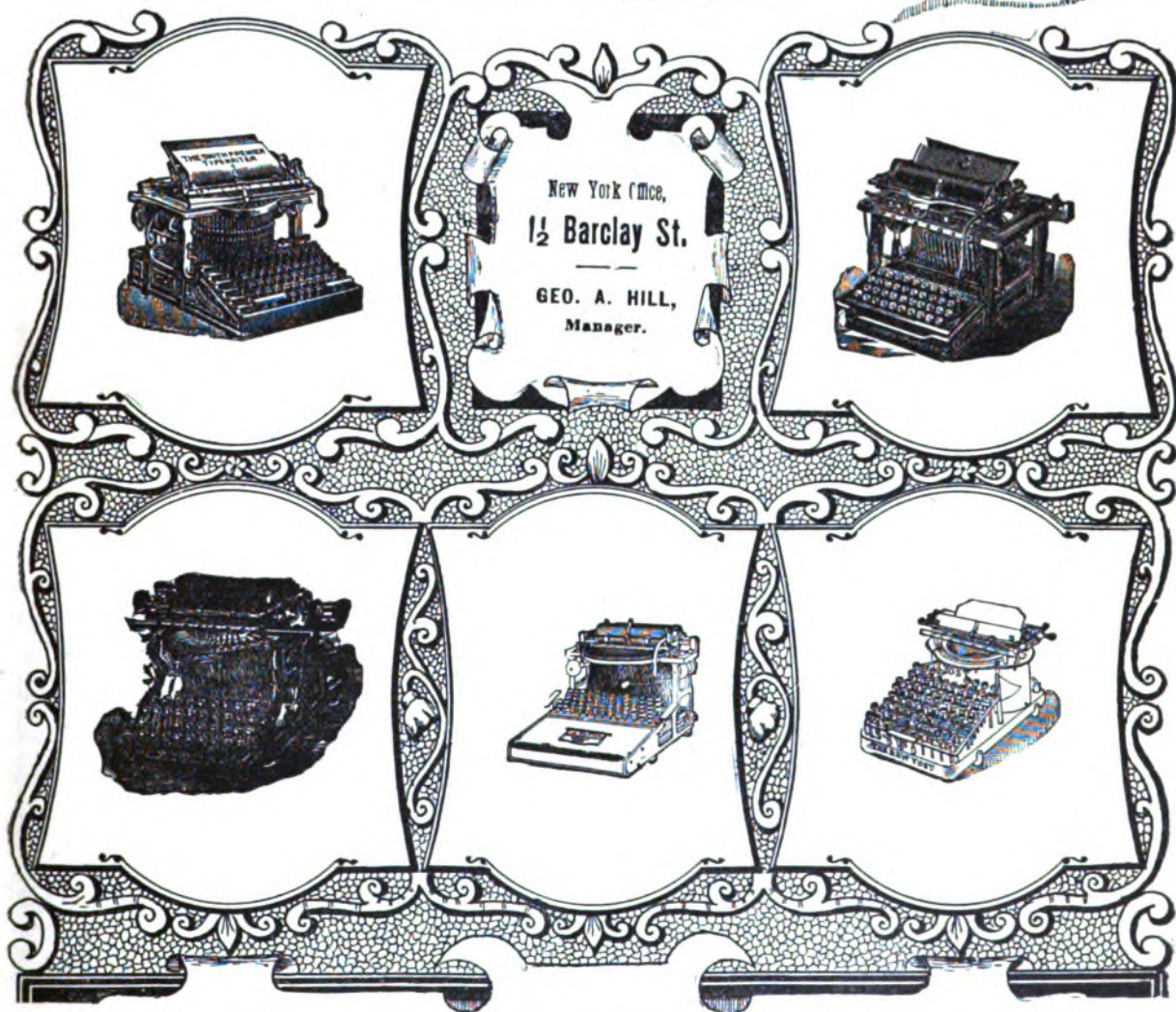
The Metric System in Congress.

Now that the House Committee in charge of the bill to substitute the metric system in place of our present system of weights and measures has decided to make a favorable report, the chances of our having to think and talk in terms of meters and kilogrammes become very real. The arguments in favor of the metric system are so many, so reasonable, and so well known, that it is not necessary to reiterate them now. Apart from the saving of time and labor among ourselves, there is the commercial advantage which will be gained by abolishing a system of weights and measures which seriously hampers us in our trade with almost all the foreign nations, and particularly with the Latin-American republics. The English-speaking races stand alone in the use of the old and largely discredited system; and although these races are far in the lead in manufacture and commerce, and have the power, if they wish, to perpetuate for many a decade to come a confessedly clumsy and antiquated system, every argument of utility and convenience calls for the substitution of a decimal system, which, by long use, has proved its all-round superiority.

It is scarcely likely, however, that such a change will be made during the present Congress, and the probability of the bill's becoming a law would be greatly increased if the other great branch of the English-speaking race could be induced to make the change simultaneously with this country. The agitation in favor of the metric system is as strong, possibly stronger, in Great Britain than it is here, and in view of the close trade relations and the enormous volume of business between the two countries, it is well worth considering whether an attempt at concerted, or rather simultaneous, adoption of the metric system would not be advisable.—Scientific American.

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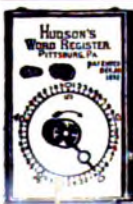
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NEW YORK, January 1, 1901.

As to 1901.

With this issue of TELEGRAPH AGE a new year, the first of a new century, opens. It is fitting on so auspicious an occasion that we should extend a cordial greeting to our friends everywhere and wish them, each one, a Happy New Year. We do this the more heartily, for, looking back over the successes of the year just closed, the promises are abundant that the year to come has even more in store in the way of business advancement and of material prosperity for all.

While thanking our agents for all benefits secured by them during 1900, and to whose personal good will and activities in our behalf this paper makes grateful acknowledgment, for large gains have been made, we wish to say that, not content with the achievements of the past, we expect to make 1901 distinctively a record year in circulation building. Never in the history of this paper has so much good matter been printed in its columns as now regularly appears. It is of a character not only to interest the reader simply, but is in a high degree of a positive and instructive value to him, providing just the material that will best aid him in his chosen profession. We believe that no operator in this broad land, no matter what his relative position may be, can keep well informed as to his calling, whether regarding its methods, its appliances or its opportunities, without reading TELEGRAPH AGE. It is a telegraphic paper, conducted by telegraphists and designed for telegraph people. This is the theory of its publication, and working along these lines our agents at every point are urged to push its interests.

At this time of year many thousands of subscriptions are expiring. It is desirable that these should be promptly renewed, and the hope is expressed that agents will take active measures to secure all of these renewals during the month of January. This will leave the remainder of the year more clear

comparatively to carry out vigorously the programme of securing new subscriptions. There are many names on our books, subscribers of years' standing, who would regret losing a single issue of the paper, whose subscriptions should not be allowed to lapse. Yet if agents, to whom many of these names are charged, are not prompt in obtaining renewals, it can hardly be expected that the responsibility of continuing a paper to any address longer than the time paid for should rest upon us. In some well known cases we might be willing to do this, but when the total of such subscriptions runs up into the thousands, it will readily be seen that we cannot continue such a large number of names without the proper authority to do so. We urge upon our agents, therefore, to promptly close these accounts during January and to make this a year of aggressive and constant activity on their part. TELEGRAPH AGE should easily find many individual subscribers in every telegraph office in the United States. This is the aim of this paper, and its general policy and proved friendship for the operator during a period of eighteen years has been such as should secure to it, through the help of its friends, the full extent and fruition of its ambition.

For Congressional Action.

Now that Congress is in session there are some measures that should receive from that body both favorable and final action, making the year 1901 a memorable one in the annals of telegraph legislation. President McKinley in his late message to Congress renewed his recommendation for the laying of an American cable across the Pacific Ocean to connect with our new possessions of the Hawaiian and the Philippine Islands, as well as at other points, urging the question upon the attention of Congress.

This is a proposition of the first importance, regarded from every point of view. We are aware that Congress has a divided opinion on this subject, but all differences of opinion concerning such a vitally important measure should be speedily adjusted and harmonized. The urgent need this country has of telegraphic communication across the Pacific by means of an American cable should be considered and acted upon from patriotic motives, and at the dictation of a broad, enlightened and non-partisan judgment.

Whether the cable should be laid by the Government or by private enterprise, or whether it should be of domestic or of foreign manufacture, are issues of comparatively minor consequence. A compromise looking to the settlement of these questions should be effected, and the welfare of the country at large, both in its Governmental and commercial aspects, should be the controlling impulse in the premises.

Another matter that should also receive the earnest attention of Congress is the question of granting pensions to the members of the United States Military Telegraph Corps, some of whom, in the small remnant that still survive, are in need of this assistance. This body of gallant telegraph men in blue rendered peculiar and highly important

service to the Government during the Civil War. The conditions under which they served, because of its secret character, called not only for expert knowledge and cool courage, but for the strictest fidelity, for the fate of many expeditions, both within the lines of our own armies as well as those of the enemy, was frequently determined by their quick witted action.

The country has been generous to its soldiers, but in all these years no financial recognition has been accorded to those who deserve equally well of their Government for loyal service performed.

President Lincoln, Secretary of War Stanton, and almost every general in the field bore witness to the faithfulness of these men, of which they all had more or less personal knowledge, and warmly approved pension measures looking to their relief. The favorable action of Congress at this time in behalf of the United States Military Telegraph Corps will be a tardy recognition of valuable services bravely performed at a time when the nation was in sore distress.

The Telegraph at the Paris Exhibition.

The successful universal exhibitions that have been held in Paris since the year 1878 may not inappropriately be regarded as milestones along the road of progress in telegraphic industries, for each in its time has not only afforded unrivalled opportunities for the study of new work, but collectively they offer conclusive evidence of the value of the various discoveries or fresh departures that have been made from time to time in various fields of research, and the degree of success that has been achieved by past inventors and workers may usefully be laid to heart by those engaged in similar efforts at the present moment. Thus, for example, glancing back at the reports of the Paris Exhibition of 1878, there will be found in the list of telegraphic exhibits the Hughes type-printing, the Baudot Multiple, the Duplex, the Quadruplex, the Wheatstone and other systems which have achieved permanent success, as is forcibly illustrated by the state telegraphic exhibits of working apparatus in the 1900 exhibition, in which they all appear as instruments in daily use. On the other hand, many apparently promising inventions which were prominent in the 1878 and in successive exhibitions have either dropped out of sight altogether or are still in the course of development—so far, at all events, as actual practical use is concerned.

Among the telegraph exhibits at the Paris Exhibition, just ceased, was that of the Rowland Telegraphic Company, of Baltimore, Md., of the multiplex type of working which will admit of eight messages being sent simultaneously, four in each direction. The apparatus was at work in the exhibition.

The Rowland apparatus has the following characteristics: Messages are transmitted from several sets of keyboards of the typewriting character, and any typewriting clerk should, with a little practice, be able to manipulate them. The messages are received on instruments which print them in ordinary type on a long roll of paper, which is perforated at convenient intervals to facilitate division when the received messages are printed.

Monsieur Ernest Mercardier, of Paris, exhibited his multiple telegraph system, in which it is said that twenty-four messages can be simultaneously transmitted over one circuit, twelve in each direction. It is based on the harmonic system of telegraphy, one form of which was devised by Elisha Gray many years ago. Mercardier's method, however, is not a copy of Gray's, as by the use of telephone receivers and transmitters combined in various ways he has designed an absolutely independent method. Harmonic telegraphy depends on the fact that if a number of vibrating reeds, each differing by a certain defined period, say of a musical note, be so connected that each in the course of its vibrations causes a series of currents to be sent into a line wire, the resulting current so formed consists of a series of irregular but well-defined curves, which are due to the combination of the whole series of vibrations emitted by the different reeds, just as in a musical note the sound curve is not a simple one, but is that due to the fundamental note on which are superimposed the overtones. At first sight it would appear as though it would be impossible to dissect the combined current curves, due to the superimposed currents, into their initial undulations. In practice, however, if each of the receiving reeds or telephones, joined up at the receiving end, be tuned to exactly the same pitch as its corresponding transmitting reed at the far end, the receiving reed will respond to the current of the corresponding transmitting reed and to no other, and even though the whole of the transmitting reeds are worked simultaneously, each being used for sending separate Morse characters, the respective receiving reeds select the Morse characters of the right note and disregard all others.

As transmitters, Mercardier uses electrical vibrating reeds of a well-known character, and as receivers he uses a combination of a telephone and a microphone, the latter sending out a powerful series of undulations into the local circuit, these undulations being selected by suitably designed telephones, which only respond to the vibrations to which they are tuned. The method, therefore, is a Morse method pure and simple, in which, so far as the operating is concerned, the telegraphist uses a Morse key for signalling, and the receiving telegraphist uses telephones as sounders.

This system requires a metallic circuit for thoroughly satisfactory working.

MAGNETIC CLUB.—The annual business meeting of the Magnetic Club will be held in Room 60, 195 Broadway, New York City, on Thursday, January 10, 1901, at 5 o'clock P. M., for the election of officers for the year 1901 and of four members of the governing committee to serve for two years; and for the consideration of such other business as may come before the meeting.

PORTO RICAN TELEGRAPHS.—General Greely, Chief Signal Officer United States Army, has been informed that the Signal Corps telegraph lines in Porto Rico have been turned over to the control of the civil authorities of the island.

One More Old Timer Gone.

M. L. WOOD.

Died at his residence, Kirkwood, Florida, November 21, 1900, aged 81 years. The ominous "30" registers a loss to the quite rapidly receding list, of one of the finest operators of that entire number. An athlete in strength and vigor, and entering the service at thirty years of age, a protégé of Hon. Ezra Cornell, of early telegraphic, but later university fame, he was well fitted to assist conspicuously in working out the difficult early problems of the frail copper wire, the mud insulator, and the cotton wound relay magnets, of every grade of resistance, and vying, in the same circuit, to destroy all possible of the small current, expensively furnished from platinum and quicksilver. These magnets were of about 24 lbs. weight each, mainly of No. 16 copper wire.

The poverty of the service of that day when he



THE LATE M. L. WOOD.

entered it, can hardly be described; scarcely imagined. The inefficiency of the receiving magnets, greatly intensified the difficulties of the five hundred miles circuits, that year first attempted to be worked. Not a wire yet west of Buffalo, N. Y., nor east of Boston, Mass., and scarcely a lateral feeder, the incipient telegraph, when he came with it, was serving a staid eastern population, which failed to conduce to great necessities, a sufficiency of earnings, by patronage.

Almost the first lateral line of the world had naturally come at the Cornell hands to Ithaca, N. Y., the Cornell home. Mr. M. L. Wood was placed a pupil in that office under the able instructorship of Hon. James Eddy, who a few months later was invited to the superintendency of the American Telegraph Company, reaching eastward toward a yet unborn and unsuggested Atlantic cable, and where Eddy laid down his frail life, all too early.

Right here, and with Mr. M. L. Wood's first year in the service (late '46 and early '47), came an

element into it which not only promised, but brought greatly accelerated earnings to the new system. It called for more enduring men, and he was put forward, and into the breach, as one of required physique. It was the very year of the then greatest flour and grain speculation of the western world, down to that day; taking the root of its necessity, of course, from the eastern continent. Even the best light of electric intelligence was not reaching forward fast enough to answer the demands of that day. There were ocean steamers plying between the great corn market centers of Europe, and Halifax and Boston, even then, but they were too slow for the fortune hunters of New York city and the West.

To satisfy these urgent interests the telegraph lines were being pushed forward from Boston to Halifax. Construction work had been completed as far as Portland, Me., leaving a gap between that point and Halifax, N. S. In order to transmit the foreign news taken from the steamers at Halifax to Portland, gave rise to the adoption of a system of signaling across the wild and rugged country, abounding with wild beasts, separating the two cities. This signal service was established in advance even of Gen. Butterfield's pony express, and consisted of a showing of colored signal lights displayed from hilltop to hilltop. Mr. Wood's station on this signaling line, was on the famous peak known as "Blue Hill."

The arch enemy of that region was so largely in evidence, the ever present army of hungry wolves, that constantly threatened the rude camp, and dogged the heel of the adventurers, that never less than two men, with blazing pine torches, were trusted to cover the several miles down from these peaks, to even the rudest civilization. The system of signaling had to be worked mainly at night, and the weary tramp just before day, to reach civilization, now and then witnessed an attack, within striking distance of them. This method of transmitting news served its purpose well, but receded speedily with the advancing telegraph.

Mr. M. L. Wood was born near the village of Dryden, a few miles only from Ithaca, N. Y., September, 1819, the brother (slightly younger) of Mrs. Ezra Cornell. Hanging in the office of the youngest of that trio of brothers, Orrin S., Merritt L., and Otis E. Wood, where the last named is still doing business actively, is a testimonial to the deceased, from that genial gentleman, Prof. S. F. B. Morse. It also sets off, in a marked degree, characteristics of the loveliness of the Morse character. Addressed to them as three of the superintendents of the principal lines of that early day, he says: "Most happy shall I be, if, by a simple letter of mine, I can render you worthy brothers any service." After many other pleasant words, he closes with: "Sincerely your friend and servant." The last two of those warmly expressed words, are never added, except by the truly polite gentleman. Few, except the old timers, enjoyed a pleasantry of Morse, often seen then, never seen now. He was an artist. He had an aptness of pen sketch: and he was a telegraphic "dead head." When his free message was

presented at an office window, it most usually had affixed, under his artistic signature, the horrid skull and cross bones, as the price it proposed to pay. Mr. Wood had a jolly nature, and when it rubbed against Prof. Morse, a warmth of feeling and fun ever came.

On those occasions it always brought out the relation of the Morse practical jokes, he always loved to play, only one of which, an old timer's obituary will permit us to give.

Measured by Mr. Wood's years from 30 to 80, fifty years, it does not seem to mean so long a time, as does this Morse joke well illustrate where the world really stood, when the old timers came. An earlier Silliman occupied the Chair of Chemistry and Philosophy at Yale. He was the confidential friend and adviser of Morse, in those early bringing out days. They were as different as men could be. The former was entirely sure that nothing ever had existed; aye, more, or ever would exist, unless it could be proven. Morse was restful under it, not liking to be thought a lunatic, wholly irreverent, or quite blasphemous in his ambitions; but he meant to pay Silliman, some day and in some way, for his temerity in not encouraging Morse that his invention would surely become practical, and enter into daily life. Christmas eve, in the middle forties, first after the line from New York, on its way to Boston, reached New Haven (but Silliman had neglected to pay it the proper respect of first class curiosity) Morse planned a merciless revenge. That indomitable messenger boy, George E. Shepard, who died, as many old timers will remember, worked to death on the Erie Railway, was on duty at New Haven. Morse always loved the twinkle of his eye, because he knew George saw it, when one twinkle of Morse's eye assured him something "smart" was on. George was to report early, before daylight, carry a carefully prepared over-night message of Christmas congratulations from Morse, New York, to Silliman; get into the house before Silliman should get to his breakfast, and to his work; because, as he was so inveterate a worker, he was not the best respecter of his holidays. George was instructed to carry his tongue and his ears with him, tell all he knew if Silliman raised a question, and take in carefully every word he might say, and return quickly, and report it to the office. Silliman, before light, answered the venerable "door knocker" in his dressing gown, disclosing to the august personage an undersized stout boy, with hat in one hand, and a letter in his extended other hand, with the polite salutation: "Good morning, awful cold, sir." "It brought the remark George aimed at: "Come in, lad." Sleepily, dreamily, Silliman clumsily opened the letter, read, and re-read, while George absently, but with every thought on his work, scanned the hall museum of the great man, who scanned the message, with the inquiring words: "But I don't understand this." Making the best of his opportunity, George explained that of which Yale had never yet heard (but those handling it had come to style it) that it was a "telegraph dispatch." Silliman's incredulity, as was its wont, seized the great

chemist, and while he plunged more into its comprehension, he uttered: "But I don't understand this; it is not Professor Morse's signature." George, not only knowing it was no use to banter with the great man of Yale, but also, that he had been loaded with just what he was sent after, retreated musingly, with "good morning, sir," but ran every step of the way to the office, with his laughing report, "I nailed him."

Morse, to his latest breath, told this joke, every time he thought of it, usually accompanying his hearty laugh, with: "This settled all the differences between dear old Silliman and myself."

Scientific men stood aghast at the embarrassment of Silliman.

In the death of Mr. Wood we are reminded that the old timers reached back with Morse, as the sole connecting link between Silliman and Franklin.

A little later, while the clouds of earlier competition were merging into consolidation, Mr. Wood retired from the telegraph for a few years, purchasing the great warehousing grain and lumber business of Williams Brothers and H. W. Sage, at West Ithaca. Selling the same finally to Hon. W. W. Esty, he re-entered the telegraph work for which he was so admirably equipped, as general superintendent of the United States Telegraph Company, and later of the Atlantic and Pacific Telegraph Company, for many years; leaving these for the superintendency of the Ithaca and Cortland Railway.

Like the many old timers of those great trials, but greater successes, we almost envy him, and them, their companionships with those great souled men, who, in their lovely lives, paid their money and their labors unsparingly to spread light among their fellows, and throughout the world, Morse, Sibley, Faxton, Cornell, and a dozen more like them; but who, in their lovelier deaths, bequeathed their fortunes in farther reaching effort, to more easily and more rapidly diffuse every intelligence, not only to present, but to future generations forever. To another distinguished and lamented old timer, we say: "Enter ye into the joys." We drop a tear of sympathy that the former, almost the strongest man of his time, laid down mortal life with five invalid years from unrelenting rheumatism.

The Alphabetical Society.

A correspondent wishes to know what the Telegraphic Alphabetical Association of New York represents. The Telegraphic Alphabetical Society is composed of Western Union officials who semi-occasionally take a summer outing or have a winter dinner served in some quiet corner at Delmonico's or Sherry's. As the members never could agree upon a name, the Society is known as the T. S. F. T. A. O. T. C. O. T. O. A. E. O. T. W. U. T. C., which, when interpreted, means, "The Society for the Amelioration of the Condition of the Officers and Employees of the Western Union Telegraph Company."

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England's Poor Telegraph System.

London, Nov. 17.—For several years past the newspapers of this country and the entire commercial community have been engaged in an unsuccessful endeavor to bring about much-needed reforms in the administration and working of the public telegraph service. Over thirty years have elapsed since the state purchased from about half a dozen different and competing private corporations the then existing telegraph systems. The act of Parliament authorizing the purchase and providing the necessary funds also gave the state a monopoly of electrical communication and placed the administration of the telegraphs in the hands of the Post Office. The deal was universally applauded, for the newspapers had been bribed by the concession of a very cheap rate for press despatches and the rest of the community were led to believe that the telegraph would soon be made comparatively as cheap and well managed as the penny post. Eleven years elapsed, however, before the cost of telegraphing was reduced for the ordinary citizen, and practical telegraph men were so tightly bound by red tape that little progress in other directions was made. When the telephone was introduced into this country from the United States it was fiercely attacked by the Post Office bureaucrats in the belief that it would supersede the telegraph. Ultimately, after costly law suits, the courts decided that the telephone came within the terms of the act of Parliament and could not therefore be used here without the consent and authorization of Her Majesty's Postmaster-General. The postal men who controlled the telegraph had neither the courage nor the foresight to buy up the American patents, lock, stock and barrel, and go into the telephone business themselves. They therefore issued licenses to private corporations and hedged them round with such manifold restrictions that enterprise was crushed and the telephone system of the United Kingdom became a by-word among the nations. Six years ago the Post Office Rip Van Winkles awoke from their slumbers and again appealed to Parliament to help them. Parliament dutifully passed an act by means of which the Post Office people received funds with which to buy the trunk lines of private corporations, who thenceforward were to be restricted to local exchange business, an arrangement which suited them very well indeed. They obtained for their trunk lines a price about three times their intrinsic value, and they cheerfully accepted the profitable local traffic and gave the Post Office the unprofitable trunk line work. Three years later the Rip Van Winkles again rubbed their eyes and after looking around saw things which displeased them. They asked and obtained Parliamentary powers and funds with which to compete actively with the private corporations, or rather with the one corporation—the National Telephone Company—which had survived the stress of unfair government interference. As might have been expected, the result of all this muddling, vacillation and inaptitude is that this country has the worst telephone system in the whole world. The telephone has not even yet en-

tered into the daily business life of the British people; it is still a luxury, and bids fair to remain so for long years to come.

While the Post Office bureaucrats were thus engaged in the congenial occupation of strangling private enterprise in the telephone business and, incidentally, in the district messenger and tape ticker businesses, they allowed their own telegraph business to go to the dogs. The system grew steadily worse until to-day the state of telegraphic affairs is absolutely unbearable. In 1896 it became evident that a retrograde policy had been deliberately decided upon and enforced, but it was not until three years later that proof was given to the world by the Telegraph Chronicle, the organ of the telegraphers of the United Kingdom. By some means, which a special departmental committee failed to discover, this enterprising paper obtained and published the confidential report of a secret commission which was appointed in 1895 for the purpose of ascertaining how money could be saved in the administration of the telegraphs. The commission deliberately reported in favor of economy before efficiency. Controlling officers were warned that money must be saved at all costs, and departmental protection was promised in the event, certain of course to happen, of increased delay in transmission consequent upon the saving of pence. They were urged to give scant consideration to newspaper despatches, and the golden rule laid down for their guidance was that a minimum staff should be kept for maximum requirements.

Needless to say the telegraph service was utterly demoralized by these recommendations. Errors and delays became the rule instead of the exception. To-day it is nothing unusual for a press despatch of less than a hundred words to occupy three to four hours in transmission, say, from London to Dublin, private messages of twelve words very rarely obtain delivery within an hour of handing in, and in London it takes twice as long to send a message from one part of the city to another, a few miles, than it does to telegraph 500 miles to the north of Scotland. The publication of the confidential report of the secret commission roused the newspaper people to action. They waited in deputation upon the newly appointed Postmaster-General, the Marquis of Londonderry, and heard the soft words which proverbially butter no parsnips. To-day, however, it is announced officially that a new post has been created, that of "manager of telegraphic traffic," and that two experienced telegraphers, E. Trenam, of Manchester, and T. Mason, of London, have been appointed joint managers. Both men have risen from the rank of operators. Mr. Mason has long been manager of the "Special Arrangements Branch," and Mr. Trenam has been chief superintendent of the telegraph department at Manchester. If these two men could have free hands in the much needed reorganization of the telegraph service they would be able to revolutionize the system.

Practical men agree that what is imperatively required to extricate the Government telegraph service from the slough into which it has been

allowed to fall is the appointment of a trained telegrapher as "Telegraph Master General" with full powers of control and administration and subject only to the Postmaster-General or to Parliament. Failing that, the only hope of salvation would be a reversion to the system of private competing telegraph corporations which Parliament arbitrarily abolished thirty years ago. There are few thoughtful men in this country now who do not deplore the existence of the Government monopoly in telegraphic and electrical matters. That monopoly has not only given the country an inferior telegraph service and a disgraceful telephone service—it has strangled many promising enterprises and has driven British talent into seeking foreign outlets, with the result that if an electric outfit is required here for railroad or trainway or what not it has to be obtained almost invariably in the United States. Such are the fruits of government monopoly and incompetent administration.—N. Y. Sun.

The Telephone and Train Dispatching.

It was recently announced that the Northern Pacific Railroad Company would substitute the telephone for the telegraph along its line. It is now said, however, that the idea of substituting telephone for telegraph in all of the departments of the road is entirely out of the question, and in the train service department would only be the means of inviting every element of danger which all lines spend thousands of dollars every year to erect safeguards against.

Some few years ago there was a proposition brought up by one of the superintendents of the Northern Pacific to use the wire on the fences along the right-of-way for telephoning, and in this way relieve the telegraph system of a great deal of the business of the traffic department that at present not infrequently congests the wires. Along the right-of-way of the Northern Pacific the greater portion is fenced with wire, and it was the scheme to connect the breaches and make a continuous wire from St. Paul to the coast. However, the matter was dropped, and, it is said, it may be that this scheme has again been revived.

It is also said by officials of the road that the plan as announced to connect each station with the general headquarters by the long-distance telephone, so far as traffic matters are concerned, is practical and would be the means of relieving the wires of much business that at the present time goes over them and could just as well be telephoned. This has been done by a number of the large railroad companies and has been found to give general satisfaction. But in the train department that is another question.

There is no department of a railroad that is more carefully watched than that of the train dispatcher's office. It is a well-known fact that the telephone is by no means a reliable instrument, and particularly in the matter of transmitting numbers. Even what the outside public would probably think a trifling matter might be the means of a very serious wreck. So it is that the road, and, in fact, all lines of railway, pay more attention to the train dis-

patcher's office than to almost any other part of the system so far as accuracy is concerned. In this department it will never be possible to do away with the telegraph.

On a single track road the length of the Northern Pacific there may be at one time 100 trains moving in both directions. Every one of these is traveling on orders from the train dispatcher's office. He is the one man who knows just where every train is and he is the man who says where every train shall pass and at what time. All trains are run on orders from his office.

When a dispatcher sends out an order it is taken by the receiving operator on a blank furnished by the company. In the taking there must not be an erasure of any kind. When the receiving operator has got the order his first duty is to repeat it to the sender, who checks every letter and figure to see that there is no error, and then signs. When the conductor comes to the office to get the order he must first read it in the presence of the operator before signing it. This is that he may fully understand it, and if not, he will ask regarding it. Then, when he delivers a copy to the engineer, he waits while the engineer reads the order to make sure that he understands it, and then, if all is well, the train pulls out according to instructions.

It will be readily seen what the telephone would mean in matters of such importance as this. It simply is not practical.

S. F. B. Morse's Old Home Sold.

The old home of Prof. Samuel F. B. Morse, the inventor of the telegraph, situated on the old Post Road near Poughkeepsie, N. Y., has been sold by William Morse, one of Prof. Morse's sons, to F. J. Hulst. The furniture in the old house has been disposed of by Mr. Morse to friends in Poughkeepsie, who will treasure it on account of its associations.

Mr. Morse's wife is dead, and his daughter and brother are abroad, and as there was no one in the family who cared to take the old place, he decided to dispose of it. The property is one of the handsomest on the South Road.

SERIAL BUILDING AND LOAN ASSOCIATION.—The old board of the Serial Building, Loan and Saving Institution, of New York, has been renominated without opposition, as follows: D. B. Mitchell, President; E. F. Cummings, Vice-President; Thomas M. Brennan, Treasurer, Edwin F. Howell, Secretary, and J. B. Sabine, A. A. Rich, Attorneys.

Directors: Jno. Brant, T. F. Laing, E. W. H. Cogley, W. J. Quinn, Max Wustrow, F. W. Gregory, W. C. Burton, T. A. Brooks, M. J. O'Leary, Eugene F. Vacheron, T. E. Fleming, M. W. Rayens, H. G. King, G. H. Schnitgen, William Holmes.

Auditors: R. M. Nesbitt, Jas. R. Beard, George Murphy.

Bankers: Mercantile Trust Company, New York.

Alternating Magnetic Fields as a Therapeutic Agent.

An exceedingly interesting series of experiments has been carried on lately by Mr. John Burry, of 69 Broadway, Brooklyn, upon the effect of alternating fields of magnetic force upon various inflammations and diseases of that class in which pain is caused by failure of the natural circulating and draining functions of the part affected. The apparatus in use is exceedingly simple, consisting of solenoids of a size convenient for the admission of various parts of the body or of the whole body of the patient, and directly actuated by alternating current at a requery of 60 cycles per second. It is claimed that the pain of rheumatism is eliminated in from 10 to 15 minutes and does not return for some time after the use of this apparatus. It is said also to have proved remarkably efficacious in the treatment of writer's and telegrapher's cramp, and very successful in the treatment of toothache when this is caused by diseased conditions of the jaw-bone. Mr. Burry has maintained for some time past, at the address above, what is practically a free hospital in which he has treated a large number of patients for the purpose of acquiring experience and making observations upon the effect of this singular application. While hesitating to express any theory of the action of the apparatus he is firmly convinced that it produces extraordinary activity in the various osmotic and other functions of the cells of the afflicted tissues, and he has had the gratification of producing what are, at least apparently, cures in a number of more or less difficult cases. So far this application does not seem to have been investigated fully by electro-therapeutists or under hospital conditions, but from the various accounts that are received it is at least an interesting, if not a highly useful, application of electricity in the relief of suffering and the cure of disease—From *Electrical Review*, December 5, 1900.

It will be remembered by our readers that in the TELEGRAPH AGE of December 1, page 507, we stated that Mr. John Burry, who is a telegraph expert, invited operators to try his method of treating writer's cramp at his office 69 Broadway, Brooklyn. We hope that members of the telegraph profession suffering from this cause will avail themselves of Mr. Burry's offer of free treatment.

During the past two months experiments have been conducted at his Brooklyn office on 173 patients suffering from various diseases, all of whom have been benefited or cured.

The friends of Mr. J. B. Taltavall, the publisher of this paper, will be glad to hear that Mr. Burry has undertaken to restore his eyesight. Atrophy of the optic nerve had entirely destroyed the sight of Mr. Taltavall's left eye eighteen months ago, and since that time an heroic fight has been maintained to save his right eye, the sight of which has been gradually failing during the past twelve months.

Although he has only undergone the Burry treatment three weeks, some improvement in his sight is apparent, and he is encouraged to believe

that further treatment will permanently restore his vision.

Publications.

"PHILLIPS' CODE," by Walter P. Phillips, 9th edition, 69 pages. This unique and efficient guide for the transmission of press reports still maintains its great popularity; bound in flexible leather; price, \$1.

"THE QUADRUPLEX," by Wm. Maver, Jr., and Minor M. Davis, 128 pages, 63 diagrams and other illustrations; treats of the technical side of telegraphy in a manner at once simple, comprehensive and easily understood; bound in cloth; price, \$1.50.

"LIGHTNING FLASHES AND ELECTRIC DASHES," 160 pages, illustrated. An original and sparkling collection of telegraph stories, quaintly descriptive of scenes and incidents that a telegrapher will appreciate and heartily enjoy; bound in cloth; price, \$1, reduced from \$1.50.

"AMERICAN TELEGRAPHY," by William Maver, Jr., enlarged and improved; 600 pages; 475 illustrations; clear, lucid and comprehensive in its treatment of the subject, the ranking work of its kind, and of high practical value to every telegrapher; bound in cloth; price, \$3.50.

"TELEGRAPHERS OF TO-DAY," by John B. Taltavall, 354 pages. This volume, of which but a few copies of the first edition now remain, presents a compendium of illustrated life sketches of over 800 well-known telegraphers who have been prominently identified with the telegraph during the past fifty years; bound in cloth; price, \$5.

"POCKET EDITION OF DIAGRAMS AND HANDBOOK FOR TELEGRAPH ENGINEERS," by Willis H. Jones, 115 pages. 54 full-page diagrams. This book places before the telegrapher a pocket edition of diagrams designed to take the place of the incomplete drawings which nearly every chief operator, lineman and student carries; bound in flexible imitation leather; price, \$1.

"THE TELEGRAPH IN AMERICA," by James D. Reid, 894 pages, illustrated. This book is of marked interest and worth, inasmuch as it contains telegraphic records of great historical value, not to be found elsewhere. There are only a limited number of volumes of this great work now available; bound in full morocco; price, \$7.

Any of the above publications will be sent on receipt of price to any point in the United States or Canada, express charges prepaid. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

TELEGRAPH COMPANY ORGANIZED.—Articles of incorporation of the Postal Telegraph and Cable Company of Tennessee have been filed at Nashville. The incorporators are Samuel A. Duncan, Elwood H. Bryan, Charles P. Bruch, Andrew P. Martin and Paul O'Connor. The capital stock is fixed at 50,000, and the company proposes to construct under this charter several lines through Tennessee.

Appointed Assistant Superintendent.

Mr. Charles E. Bagley who was appointed assistant superintendent of the Postal Telegraph-Cable Co., at Boston, Mass., on December 1, was born in that city January 7, 1866. His entry into the telegraph service was in 1881 in his native city, where he has always resided, and where in various capacities he has acquired the telegraph experience that has resulted, at the age of thirty-four,



MR. CHAS. E. BAGLEY,
Asst. Supt. Postal Telegraph-Cable Co., Boston, Mass.

in his promotion from the office of manager of all the Boston Postal offices, which he has held during the last six years, to the position he now occupies.

The Associated Press Not a Trust.

Judge Sherwood, of the Supreme Court of Missouri, on December 17, handed down his decision in the case of the St. Louis Star against The Associated Press, in which he ruled that the latter organization is not a monopoly, and the Star cannot compel it to sell news to the Star.

An alternative writ was issued setting up that The Associated Press was affected with a public interest such as would compel it in law to serve any applicant, and alleging that agreement with its members in St. Louis that it would not serve rival papers without their consent was in violation of what is known as the Sherman anti-trust law, the anti-trust law of Illinois, and the anti-trust law of Missouri.

The Associated Press made return to the alternative writ of mandamus, claiming that it was a mutual organization having for its purpose the collection and exchange of news at cost, and that its organization as a share-holding company was purely for the convenience of administration; that it never attempted to sell news at a profit; that it never represented itself as a general purveyor of news; had never sought to sell news to the public; had never paid dividends; nor had it ever had in contemplation the conduct of a dividend-paying business.

The Postal main office at Denver, Col., is to be enlarged to better accommodate the rapidly increasing business at that point.

"Get Your Money's Worth."

"Did you ever stop to think of the length to which the average American man and woman will go in order to feel that they are getting value received?" asked the talkative telegraph operator of the Bangor newspaper man who had just dropped into the office to wire James Gordon Bennett declining the managing editorship of the New York Herald.

"It's a fact, though," he continued, "and here in a telegraph office we're up against that sort of thing almost every minute of the day. Get Your Money's Worth is an American motto all right, all right, even if we do have the reputation of being the most liberal nation on the face of the globe, and according to my way of thinking it's no disgrace if it is.

"Nine people out of ten when they come in here to send a telegram can easily get all they want to say into a ten-word message, costing twenty-six cents, and by far the greater majority of them make an awful time in filling the blank up to their satisfaction. For instance, some man will come in here with the intention of letting his wife know of the time he expects to arrive home. He will twirl a pencil about in his finger for a few seconds and then he will write, 'Arrive home Thursday morning,' or whatever other time it happens to be. This is all that he really wants to say, but on counting his message he finds that it contains only four words, something that will never do in the world. He is paying for ten and the instinct to get the other six in somehow is strong. He never seems to think of letting well enough alone and letting the message go as it is.

"The man screws up his eyes and gazes fixedly at the clock for a few minutes and then he takes a fresh blank. For a moment he pauses undecidedly, and then he writes the same four words that he inscribed before, 'Arrive home Thursday morning.' Here he stops helplessly and counts the words over three or four times. At last he seizes the pencil firmly and adds, 'Hope you and John are well.' Then the man counts his message over, finds he has exactly ten words, puts the exact change on the counter and walks out of the door with the consciousness of 26 cents well spent. It's a funny thing, but I tell you it happens almost every time.

"When you think of the time that the average business man, who usually is so chary of his seconds, wastes on sending messages of this sort you are actually astonished. It amounts up to considerable at the end of the year. Very often you will strike a man who needs a few more than ten words in which to express all that he wants to say, and then the boot is on the other leg with a vengeance.

"Why, I have frequently seen men scheme for fifteen or twenty minutes to keep their message down under the ten-word limit so that they wouldn't have to pay the telegraph company a few cents extra. The great proportion of these men wouldn't think of economizing on such a scale in anything else, but so long as it's a telegram it's different."

TELEGRAPH AGE is convenient for reference.

The Men Who Handle a Large Telegraph Office at Night.

Mr. Edward F. Cummings, night manager of the Western Union Telegraph office, 195 Broadway, New York, owing to sickness, which has kept him



MR. JAMES C. ROBINSON,
Night Manager, Western Union Telegraph Co., New York.

from the office for the past sixteen months, has resigned, and Mr. James C. Robinson, for many years assistant night manager, has been appointed to fill the vacancy. Mr. Frank D. Giles, has been



MR. FRANK D. GILES,
Asst. Night Manager, Western Union Telegraph Co., New York.

appointed assistant night manager, and Mr. E. T. Burrill has been advanced to the position of general night traffic chief.

Night Manager Robinson is a native of New Hampshire, having been born at Portsmouth, Jan-

uary 14, 1849. He entered the telegraph service in 1864, and he has had, therefore, thirty-six years' telegraph experience in all branches of the operating department. He came to New York in 1882, and held various positions on the night force, working his way up from an operator to his present appointment. He is an extremely popular official.

Assistant Night Manager Giles was born near Ovid, New York, July 28, 1849. He also entered the telegraph service in 1864, in the West. He has held important positions in various sections of the country, including Pacific Coast cities, and coming East, he entered the Western Union Telegraph Company's service in the New York office in 1885, since which time he has held various official positions in the general operating room.



MR. E. T. BURRILL,
General Traffic Chief, Western Union Telegraph Co., New York.

General Traffic Chief Burrill is also of New England birth, he having been born at Newburyport, Mass., in 1860. His telegraph career began in 1874, since which time he has filled places in various Eastern cities until about ten years ago, when he accepted a position on the night force at 195 Broadway, New York.

All of these gentlemen owe their promotion to their keen telegraphic insight, cool and accurate judgment, and executive capacity for successfully handling large numbers of telegraph operators. The day manager, Mr. A. E. Sink, who has entire charge of the operating department, is to be congratulated in thus bringing about him so able a trio.

Recent Telegraph Patents.

A patent has been issued to E. B. Ellicott, of Chicago, for a telegraph signaling apparatus.

Mr. C. D. Olsen, of Denver, Col., has been granted a patent for a telegraph repeater.

LETTERS FROM OUR AGENTS.

To Our Agents.

While we are desirous to receive from our agents letters for publication respecting their various offices and their personnel, for all efforts of this character are appreciated, we would earnestly request that such communications be confined strictly within the limits of the subject, and not so much space be devoted to hunting and fishing items and other extraneous matter, as is frequently the case. We wish to make the department of "Letters from our Agents" an attractive one, but if we were to publish all that comes to us in the shape of irrelevant matter, of no possible interest to the general reader, it would frequently require us to surrender a number of additional pages to contain it all. The current information of any office will, if carefully chronicled, furnish a welcome digest of news that will be read with pleasure and satisfaction by thousands, and this limit should be the legitimate contents of all letters.

ST. LOUIS, MO., WESTERN UNION.

Among the arrivals during the last few months, who have remained with us up to date, we note: Messrs. V. D. Shackelford, M. J. Cassidy, Leon T. McKnight, W. C. McCain, Raymond Alger, Geo. Baron, E. P. McGrath, J. W. Coyle, J. W. Haygood, P. J. McGriff, Asa Davis, Roy Baker, Harrie Coe, A. J. Carlin, Geo. Miller, Theo. E. Hill, Frank J. O'Connell, Lloyd H. Lankford, Robt. Fitzpatrick, W. H. Snyder, M. J. Conerty, and M. T. Murphy.

Miss Ollie Murray, of the Wheatstone, left Dec. 15 for a vacation of several weeks. She will spend her time in Alabama.

Mrs. Bettie Turner, of Chicago, was a visitor Dec. 6.

Learning the Wheatstone—copying tape—the Misses Ida Ernesthauser, Lottie Link, M. Booth, L. Rahm, K. Walsh, Susie Schwarty, Ida Schraga, and Mrs. C. N. Philbrook; Messrs. Geo. J. Goehring, Leon T. McKnight, and Stephen Mulroy;—to punch—Messrs. Wm. Score, Raymond Alger, "Dip" McCrudden, M. J. Cassidy, and Geo. Bagot.

CHICAGO, ILL., WESTERN UNION.

Mr. Geo. E. Dunning, the newly appointed assistant chief operator, is pleased to announce his acceptance of the agency of The Telegraphers' Mutual Benefit Association, formerly held by Mr. L. K. Whitcomb. Mr. Dunning will gladly demonstrate the value of this association to the telegraph people, and will furnish all circulars and books required upon application.

Mrs. V. T. Kissinger died at St. Luke's Hospital, this city, December 10, of appendicitis. The remains were taken to Sunbury, Pa., for burial. We feel it a great loss, and her memory will live forever in the hearts of her relatives and friends, and much sympathy is extended to Mr. Kissinger.

James Carroll, of New York, was a visitor here recently on his way north.

Mr. Fred. Webber, chief operator at Springfield, Ill., was a visitor here December 18.

Sympathies are extended to Nick Hotter, who recently lost a sister.

James J. Conniff, of the City Line Department, buried his father a few days ago.

The wife of Albert E. Johnson has been at the Chicago Hospital several weeks, but is now reported as convalescent.

MONTREAL, QUE., CANADIAN PACIFIC.

Mr. James A. Collie is confined to his home with typhoid fever. It is to be hoped, however, that he will soon be at his post again. During his absence Mr. W. G. Medley has been assigned to his wire, and is apparently giving satisfaction.

Mr. S. S. Dickenson, superintendent of the Commercial Cable Co., Canso, N. S., was a recent visitor, as was also Mr. Charles Huband, chief delivery clerk, of the Canadian Pacific Railroad office, Ottawa, Ont. Mr. Arthur King, is now manipulating the typewriter exclusively, and turns out excellent copy.

Mr. John Cole, the all night check and sorter, will in all probability be among the graduates from this office next spring, judging from the advance he has made recently. He does a good deal of helping out during the wee hours, which gives him excellent practice.

Mr. D. McCrae, has resigned and returned to his first love—the grocery business. He will join his uncle, who is already in the business at Kingston, Ont.

Mr. R. H. Stephens has been transferred from the St. James street ticket office to the main office.

Christmas boxes were quite numerous this year, especially among the ladies. The usual half-holiday was generally observed, and everybody apparently enjoyed his turkey.

We wish all a prosperous and a Happy New Year.

BALTIMORE, MD., WESTERN UNION.

Oliver S. Walmsley, for the past five years receiving clerk at the Chamber of Commerce office, died on December 10, of consumption. Deceased had been in the employ of the company nearly fifteen years. He was a member of the 4th Regiment M. N. G. and of the Jr. O. U. A. M., both of which organizations were represented at the funeral. A beautiful floral tribute was sent by his fellow employees.

John I. Kuhn and C. H. Hoff are now day and night operators, respectively, at Union Station.

Carley Edwards, check boy, has been appointed operator at the Carrollton Hotel. Jacob Lepper has been appointed receiving clerk at the Chamber of Commerce.

After an absence of eighteen months, Geo. B. Kreh has returned in improved health. He is on the extra list.

A student in a country office made a number of strenuous attempts to send a message to a city office. Finally the operator in the city told him: "I will wait until the operator comes in." "All right," says Mr. Countryman. "When will he be there?"

SAN FRANCISCO, CAL., WESTERN UNION.

J. V. O'Brien has been appointed operator at Tanforan Race Track, vice Andy Martin, who has engaged in private business.

Leslie Harkness has resigned to accept a position in a commission house as operator of the Chicago leased wire.

Chas. Weiler has gone to Reno, Nev., as operator for a broker in that city.

Thos. Crow rejoices in the addition of boy number two to his family.

V. V. Stevenson has gone to Los Angeles to engage in private business.

Geo. Lowell, of the Wheatstone, and Ed. Dorgan are on the sick list.

Frank Cuyler, of the Call, is visiting friends in the country.

Electrician Lewis McKissick recently went on a business trip to Seattle.

San Francisco has some very long circuits, among them one being to New York, one to Vancouver, B. C., and three to Chicago, in the day, and several others at night.

Miss Bacon went to Chico as acting manager during the holidays.

T. E. Gallagher, of Moselle, Nev., Southern Pacific office, and formerly of this office, is visiting friends and relatives here.

The most complete tie-up of business from a wind storm that this vicinity has experienced in the history of this office occurred December 14, about 10 o'clock A. M. A southeaster struck here, and while the coast line was all carried away by a tree falling across the track, the wind carried poles and all into the bay for a distance of a mile along Oakland Mole. Sacramento became the terminus for a while of the overland routes, Portland, and other wires that usually work through to San Francisco, and a call for operators to go to Sacramento to help out was responded to by Messrs. Whipple, Bell, Ryan and Horsman. For a number of hours not a wire was working except the city lines and they were in a very bad way.

The many friends of Mr. J. V. O'Brien will be pleased to learn of his appointment as assistant to Manager Reynolds. Mr. O'Brien has been in the employ of the Western Union for a great many years and his promotion is a stimulus to others who have hopes of having faithful services rewarded. Mr. O'Brien's selection in a business way is a good one, as his extensive local acquaintance promises to come in good play in securing additional business for the company.

Mr. Dixon, division chief of Chicago office, spent a few days in this city recently on his wedding trip.

Chief Operator Converse is confined to his home with a carbuncle and quite a number of others are also on the sick list.

NEW ORLEANS, LA., WESTERN UNION.

Congratulations are extended to Mr. and Mrs. Dearman, of Hattiesburg, Miss., on the arrival of a little stranger, and the same to Mr. and Mrs. Ed. Friedman, of New Orleans, for a like occurrence.

Foreman Henry C. Turner says he is a little late

in subscribing for TELEGRAPH AGE, but better late than never.

Joseph Holthouse is with the Western Union again.

Oscar M. Donovan is with the Western Union at Hattiesburg, Miss.

W. H. Bauder has gone to Havana, Cuba.

Messrs. Bell and Johnson have joined the Signal Corps.

Wheatstone copyists and punchers: J. T. Elliott in charge; Messrs. Richards, Wark, Gowland, Smith, Bechtel, Schraut, Davis, Tognori.

New Arrivals: Messrs. Dearman, McMahon and Richardson.

DENVER, COLO., WESTERN UNION.

The personnel of this office is as follows: J. P. Altberger, manager; T. A. McCammen, chief operator; J. A. Jenkins, assistant chief; W. N. Fashbaugh, wire and traffic chief; A. C. Parsons, timekeeper and assistant traffic chief; G. E. Lawton, night chief; S. R. Beatty, night wire chief. Operators: Mrs. S. E. Hilkes, E. F. Street, J. A. Hogan, C. G. Neimeyer, Miss C. E. Smith, Joseph White, W. H. Simpson, O. E. Hogan, J. H. Ryan, J. W. Gargan, Miss Ada Guernsey, H. B. McChesney, W. E. Atchison, G. O. Henning, L. A. Crisler, C. P. Melton, Mrs. M. F. Early, M. R. Dwyer, F. S. Rochford, H. E. Madison, S. E. Smith, H. E. Thomas, W. S. Pitts, F. Wessel, Wm. C. Lampe, W. J. Pokorney (Republican office), E. T. Goodell, J. H. Masden, D. Clamage, F. E. Gargan, F. J. Martin (with Proudfoot & Co., mining brokers), W. H. Skidmore, C. M. Pedley, M. E. Harris, Miss A. L. Davy, C. H. Bowles, Henry Mandles, A. G. McKay, Miss N. McChesney, B. F. Bush, F. J. Lippert, Victor Bergstrand, W. D. McDonald, F. M. Murphy, Miss A. M. Frazier.

W. S. Pitts and M. E. Harris have exchanged positions temporarily, Pitts going to main office, Harris to News office.

J. H. Ryan spent Christmas with his mother at Kansas City.

Edward F. Street, of the Kansas City local, reported ten minutes late a few weeks ago and being questioned by Assistant Chief Jenkins as to the

\$100 Reward, \$100.

The readers of this paper will be pleased to learn that there is at least one dreaded disease that science has been able to cure in all its stages and that is Catarrh. Hall's Catarrh Cure is the only positive cure now known to the medical fraternity. Catarrh being a constitutional disease, requires a constitutional treatment. Hall's Catarrh Cure is taken internally, acting directly upon the blood and mucous surfaces of the system, thereby destroying the foundation of the disease, and giving the patient strength by building up the constitution and assisting nature in doing its work. The proprietors have so much faith in its curative powers, that they offer One Hundred Dollars for any case that it fails to cure. Send for list of testimonials.

Address, F. J. CHENEY & CO., Toledo, O.

Sold by druggists, 75c.

Hall's Family Pills are the best.

cause, smiled and said: "It is only a twelve-pound boy."

The marriage of Miss Maud May Bernheisel to Arthur C. Parsons occurred on December 26. Mr. Parsons is one of the brightest young men in the profession and every one wishes him a long and prosperous married life.

H. G. Robinson, formerly of Union station, Kansas City, Mo., has been appointed manager Equitable Building office.

E. W. Simmons is now located with a broker.

Robt. Hayes and Chas. Smith, who are with Morgan Brokerage Company, call around occasionally and renew old acquaintances.

Herbert Dodge has left us and is now located in President Trumbull's office of the Colorado and Southern Railway.

Orville B. Price is with H. S. Shaw, mining broker.

Miss Titus is our new manager at Brown's Hotel.

R. K. Pierson, agent Colorado and Southern Railway, Longmont, Colo., who worked in St. Louis, Mo., twenty years ago, looks as young as he did then and takes great pleasure in discussing old times and old timers.

Associated Press staff: H. C. Class is chief operator; Geo. Allen, night chief; Wm. Wootton, J. C. Corum and Messrs. Trickle and Horn, operators. Wm. Hunter, who has been with The Associated Press at Denver for several years, is now located at Pueblo for same association.

POTTSVILLE, PA., POSTAL.

Joseph and Wm. Bennie, formerly operators at North Mahanoy and Tunnel Ridge collieries, have resigned their respective positions and are now traveling as magicians.

Earl Boner and G. Ivory, of New Berry Junction, are enjoying a month's vacation during the holiday season.

Daniel Eagan and James Haughton, of St. Nicholas, were here lately and called to see us.

Pierce Littlehales, of Mt. Carmel, called on friends at this place on December 23.

John Brobst, night operator at Philadelphia and Reading station is the happy father of a daughter.

Thomas Merrick, of The Associated Press at Easton, Pa., and Miss Hannah Brosnahan, of the Postal, at Philadelphia, came home to spend the holidays.

H. C. Hiney, of Frackville, Pa., resigned his position at that place and has left for Philadelphia, where he has accepted a position in the terminal office.

CLEVELAND, O., WESTERN UNION.

One of the surprises of the past month was the marriage of Mr. Albert Herbert to Miss Helen Vance Fitch, of Kinsman, O. Mr. Herbert has been with the Western Union for the past four years. Miss Fitch is one of Kinsman's society belles.

The bride and groom have the best wishes of a large circle of friends.

A number of the fraternity are nursing sore arms due to the health department insisting on vaccinat-

ing those who were exposed to smallpox, which broke out here recently.

A number are away on holiday vacation. Among them are Messrs. Hay, Zink, Newman, Mrs. Kelly and Miss Martin.

David Baker has been transferred to the switchboard, where he is, like the others, "looking for trouble."

PHILADELPHIA, PA., POSTAL.

The Philadelphia Postal staff takes pleasure in extending the season's greetings, through the columns of TELEGRAPH AGE, to all other Postal employees in particular and the fraternity in general.

Our check boys and girls, of the day and night forces, presented their annual "sheet," to which the operators, from the chiefs down, responded liberally and helped to gladden the hearts of these embryo telegraphers and possible presidents.

Half-holiday hours were posted, affording every one the privilege of spending the day according to his own pleasure.

Mr. "Bob" Stoddard, who works the first Harrisburg local, took a few days off to visit and enjoy a personal chat with those with whom he works daily.

A second bonus wire was established between here and New York with the Messrs. William Wisegarver and W. F. Gardner manning it. This wire virtually replaces the common side of the first quad, which will hereafter be used for the overflows.

Proud smiles illumine the face of Mr. William Madden these days. Investigation proved the cause to be the arrival of his first son and heir. Congratulations are in order.

The transparent window clocks, giving the London, San Francisco and standard time, have been installed in their places and attract considerable attention from the passing throngs.

Resigned: Mr. J. T. Sullivan. Jake Lemisch, who resigned some time ago to enter into commercial pursuits, has again resumed a place among us. Another arrival is Mr. F. G. Spiker.

Mr. Joseph Bowers, a former employee of this company, and more recently with brokers in this city, died December 16. He leaves a wife and several children.

KANSAS CITY, MO., WESTERN UNION.

John J. Shelley, who has supervision over the check forces and is also assistant to the quad chief, is confined at his home with pneumonia.

Eugene T. Potter has journeyed to the sunny South and taken a position as night operator at a small railroad station in Louisiana.

NEW YORK, WESTERN UNION.

Mr. Harry Sauer, of the Eastern Division, has been absent several days on account of sickness.

The Eastern Division has a satisfactory acquisition in Miss Tessie M. Meyer, daughter of Mr. Conrad Meyer, Eastern chief operator, who has been assigned to the New Haven wire.

Mr. Michael C. Carr, who for the past twelve years has been employed as porter on the seventh floor, died at his residence in Brooklyn, December 12.

Miss Emma Roehm, an operator of this office, died December 24. She was the sister of Mr. George Roehm, of General Superintendent Tinker's office. Many telegraphers were present at the funeral services, and the numerous friends of Mr. Roehm extend sympathy to him and to the family.

Messrs. J. J. Phelan, T. Nolan, P. Collins and Martin Durivan have gone to Florida for the season.

Mr. P. O. Purcell spent the holidays at his old home in Scranton, Pa.

The many friends of Mr. Patrick J. Tierney, manager of the Cable office, 16 Broad street, this city, sympathize with him in the death of his wife, December 4.

Christmas was observed as usual by that spirit of peace, joy and good will which always prevails in a big fraternal family such as is found at "195." Many handsome and valuable presents were sent and received by us from near and from far to remind us of the love and esteem of our relatives and friends. Miss Eva J. Hall now wears a large-sized diamond ring; Mr. Michael F. O'Neill a scarf-pin with the colors of a rainbow; Mr. John Doyle a handsome blackthorn cane; Mr. Jerry Dunn, Geo. W. Irwin and John A. Dreams were the recipients of substantial "checks."

Typewriters expressed or sent to our shop, repaired or rebuilt at lowest prices for operators. Cylinders, ribbons, at reduced prices; machines bought, sold and rented. Wall & Butler, 57 Dey street, New York. (Adv.)

Any fifty-cent piece of music mailed eighteen cents. Rusticana, Anchored, Calvary, Palms, Flower Song, ten cents each. Anything at less than half publisher's price. I will sell you a good piano for one dollar per week, from \$35 up. B. L. Brannan, 195 Broadway, New York. (Adv.)

ANNUAL GATHERING.—Mr. E. G. Cochrane, general superintendent of the Eastern Division of the Postal Telegraph-Cable Company, New York, entertained his superintendents at dinner in this city December 19. Mr. Cochrane has his superintendents meet him in conference once a year in New York to talk over matters pertaining to the welfare of the service. Much resultant good comes from such gatherings. Those present besides the host were: Superintendents Adams, of Philadelphia; Lemon, of Pittsburg; Reynolds, of Buffalo; Kauffman, of Albany; Usher and Blanchard (superintendent of marine department), of New York; Superintendent Pillsbury, of Boston; Assistant Superintendent Bagley, of Boston, and Superintendent of Construction McCollum, of New York. These gentlemen also attended the theater as the guests of Mr. Cochrane on the evening of Dec. 20.

WESTERN UNION WINS.—Judge Lochren rendered a decision December 22 in the suit of the Great Northern Railway against the Western Union Telegraph Company, involving title to the telegraph lines along that road valued at \$5,000,000. His decision is in favor of the telegraph company. The railroad company claimed to have acquired this telegraph property when the road was bought.

Miscellaneous Items.

Mr. S. E. Elliott and Miss Manie Covington, of College Grove, Tenn., were married November 14, last.

Mr. J. H. Emerick, the well-known old-timer of New York, is still seriously ill in one of the Brooklyn, N. Y., hospitals.

Mr. M. M. Davis, traffic manager of the Postal Telegraph-Cable Company, New York, has returned from a Western business trip.

Mr. Robert H. Brooks, chief operator of the Postal, at Memphis, Tenn., was married to Miss C. Sally Mooser, of that city, on December 15.

Mr. Norman C. Sears, of the Cable office, 16 Broad street, is about to make a change to Vancouver, B. C. Mr. Sears is a very reliable man and a first-class operator, and he will be a valuable acquisition to Canadian talent.

Mr. Beil Brooks, the assistant superintendent of the Western Union Telegraph Company, Denver, Colo., was in Galveston a few days since visiting old friends. Mr. Brooks was manager at the stricken city about ten years ago, before his removal to Colorado.

Mr. Frank N. Dowler, general Eastern freight agent of the Toledo and Kansas City Railroad Company, New York, is now general agent of the Equitable Life Assurance Society, with headquarters New York city. Mr. Dowler is an old-time telegrapher, having worked in many Western cities.

Resignations and Appointments.

Mr. E. Waldron, of the Western Union Telegraph Company, Atlanta, Ga., has been promoted to be night chief operator at that point.

Mr. H. D. Lockwood, of Franklin, O., has been appointed manager of the Western Union at Greensburg, Ind., vice J. M. Shannon, resigned.

Mr. T. W. Carroll, chief operator of the Postal Company, Denver, Colo., has been transferred to a position in the office of the electrical engineer of the same company in New York. Mr. H. C. Shaw, manager at Colorado Springs, Colo., has been appointed night chief operator, vice J. B. Coggins, promoted to be chief operator to fill the place left vacant by Mr. Carroll's transfer.

CALENDARS RECEIVED.—We have received from Mr. F. B. Williams, of Patterson, La., a neat calendar for 1901, the first of the kind that has reached our table.

The Direct United States Cable Company has issued its calendar for the New Year. The design includes a daily date pad with blank space thereon for memorandums.

The Commercial Cable Company, of New York, is distributing a very neat calendar, showing on a tinted card its cable system, while at the bottom appears a weekly date pad of unique design.

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Obituary.

William H. Weller, an old-time telegrapher, died at Laporte, Ind., aged 66 years.

Edmund M. Kuhlke, a Western Union operator, of Augusta, Ga., died at that place December 19.

John Anderson, former president of the Commercial Telegram Company, died in New York December 18.

Bernard J. Burke, an operator in the Western Union office at Galveston, Tex., died in that city December 18.

J. Platt Roberts, manager of the Postal office at Mobile, Ala., a position he had held since the first establishment of the office, died of appendicitis in that city December 10. He leaves a widow and five children.

Mr. Lester S. Hills, an old-time telegraph operator, died in Chicago, November 22, aged sixty-five years. He learned telegraphy in 1850 at Hartford, Conn., and afterwards became manager of the Hartford office. Of late years he has been identified with the Edison Electric Light Company, of Chicago.

Louis N. Kirschbaum, one of the best known New York city telegraphers, died of Bright's disease at his home in Brooklyn, on December 21, after a lingering illness. Mr. Kirschbaum had filled many positions in the service of the Western Union Telegraph Company, and of late years had been connected with the Race Bureau. He was 49 years of age and leaves a wife and two children. Mr. Walter C. Burton, chief operator of the Race Bureau, conducted the funeral ceremony.

Frederick R. Place, assistant superintendent of telegraph of the Texas and Pacific Railway, died December 7, at Dallas, Tex. Mr. Place had been connected with the Texas and Pacific about thirteen years. He went to Dallas from Hot Springs, Ark., where he was for some time manager of the Western Union office. He also worked with the Cotton Belt for a time as superintendent of telegraph before he joined the Texas and Pacific. Mr. Place was 47 years old and leaves a wife and two young sons. Deceased was a native of Louisiana, born and reared near New Orleans. He worked as an operator in that city many years ago.

U. S. MILITARY TELEGRAPHERS.—The minutes of the proceedings of the twentieth reunion of the United States Military Telegraph Corps, held at St. Paul, Minn., September 19 and 20, 1900, have been published in pamphlet form and presents in convenient shape a full report of that interesting occasion. The address delivered by the late Senator Davis is included and printed in full.

Personal Mention.

Mr. A. S. Brown, electrical engineer of the Western Union Telegraph Company, New York, is still absent from his office owing to sickness.

Mr. Charles P. Bruch, assistant general manager of the Postal Telegraph-Cable Company, of New York, has returned to the city after a business trip of three weeks in the West and South.

Colonel Charles S. Diehl, assistant general manager of The Associated Press, formerly of New York, but now located in Chicago, was a welcome visitor to the metropolis a few days since.

Mr. Charles A. Tinker, general superintendent of the Western Union Telegraph Company, New York, has so far recovered from his sickness, caused by typhoid fever, as to enable him to return to the office early in January.

Mr. T. E. Hughes, of Pittsburg, manager of the Standard Underground Cable Company, addressed the Manufacturers' Club, at Philadelphia, Monday evening, December 17, on "The Pacific Cable." Brigadier General A. W. Greely, chief of the Signal Service, and Congressman J. B. Corliss, of Michigan, also came on from Washington to participate in the discussion as guests of the club.

Mr. Morris W. Mead, superintendent of the Bureau of Electricity, Pittsburg, Pa., while in the discharge of his duty recently, fell from a ladder which he had climbed in order to find out a possible defect in wiring and broke his right leg near the ankle, fracturing several of the bones. The citizens of the Iron City ought to feel proud of their city electrician, who did not hesitate to act promptly in an emergency and personally satisfy himself as to conditions regarding which serious results might have ensued.

Recent New York Visitors.

Mr. W. S. Logue, of the Edison Phonoplex Company, of Orange, N. J.

Mr. Frank Kitton, chief operator, Western Union Telegraph Company, Buffalo, N. Y.

Mr. Geo. L. Lang, of Lexington, Ky., superintendent of telegraph of the Cincinnati, New Orleans and Texas Pacific Railroad. Mr. Lang spent the holidays in New York and Boston.

The Electric Building-Loan and Savings Association will hold the annual meeting of its shareholders at its office, Postal Telegraph Building, 253 Broadway, on January 11. A meeting to elect auditors and nominate officers will be held at the same place just before the annual meeting.

The Modern Service of Commercial and Railway Telegraphy (8th Edition, revised and enlarged), by J. P. Abernethy. The theory and practice, including railway station and express service. Arranged in questions and answers. 425 pages, 40 illustrations. Price \$2.00, expressage prepaid. Address John B. Taltavall, The Telegraph Age, 263 Broadway New York.

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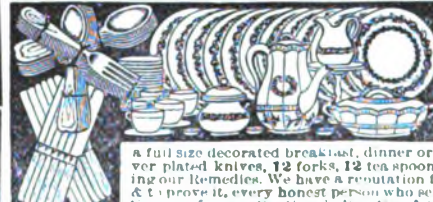
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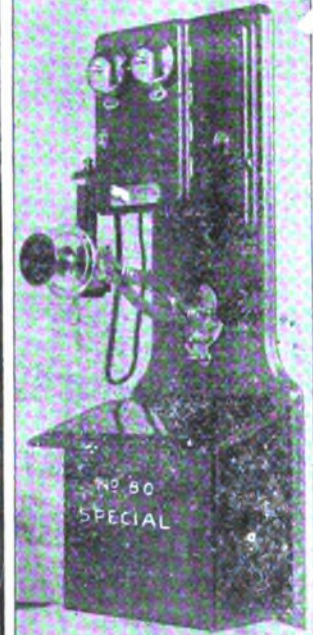


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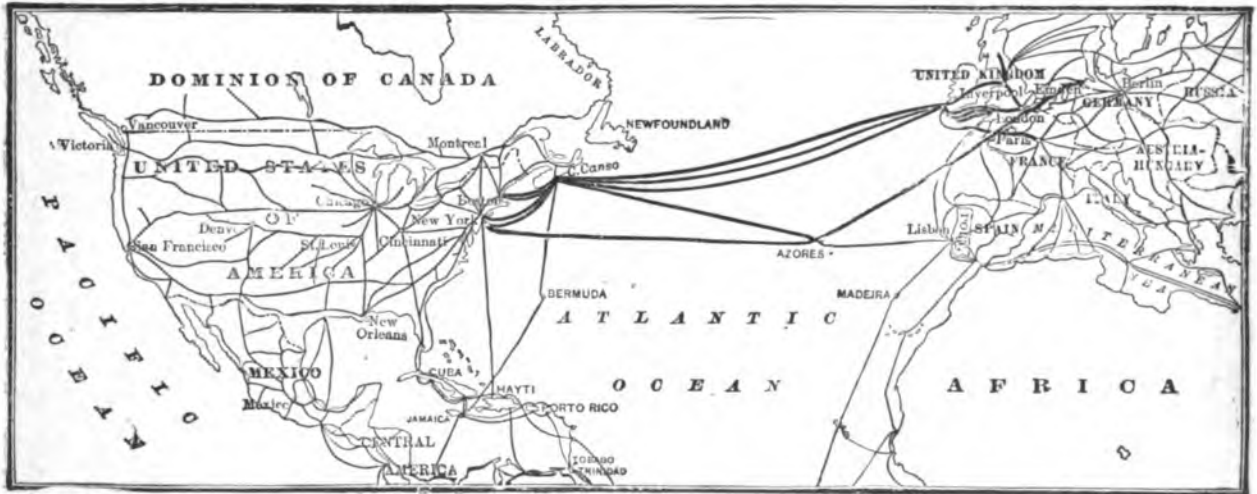


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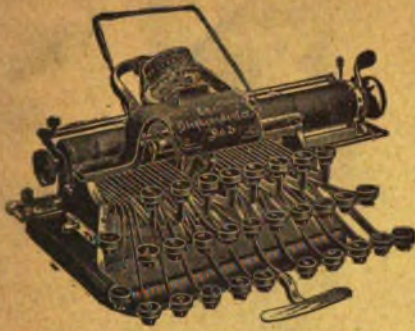
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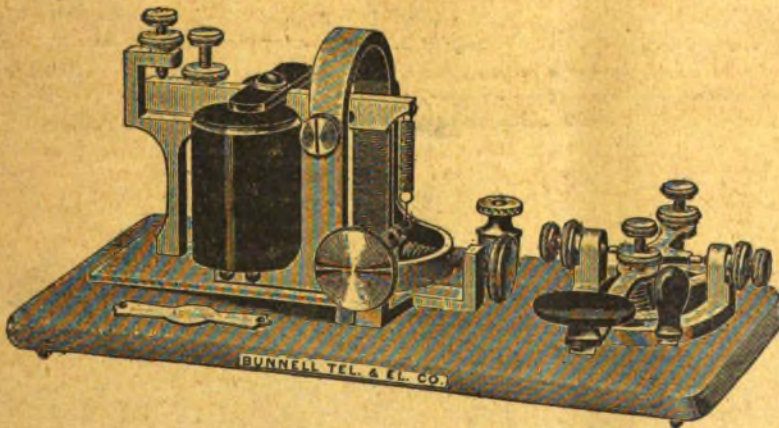


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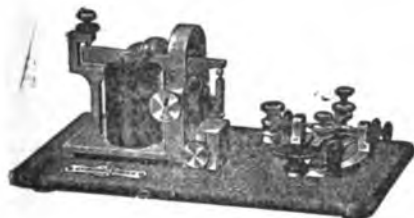
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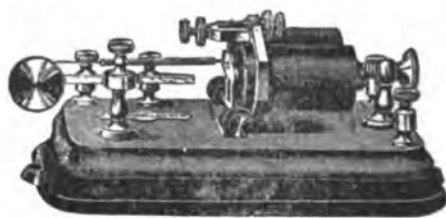
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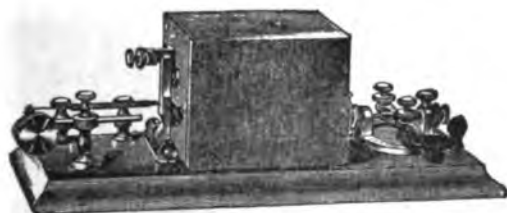
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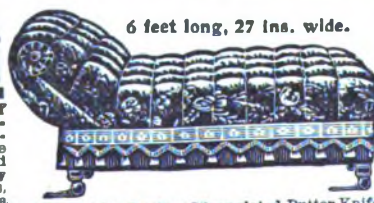
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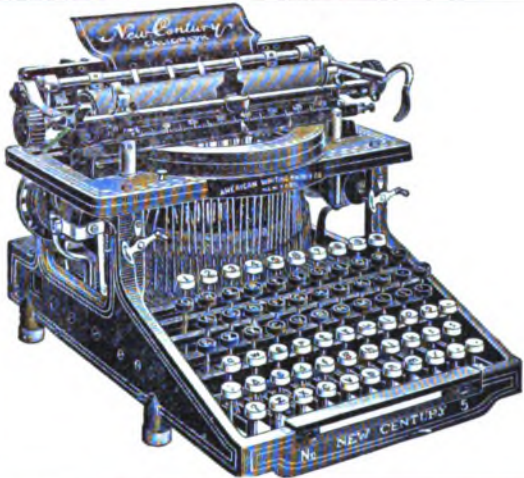
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THE TELEGRAPH AGE.

No. 2.

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

The Galvanometer—Continued.

Having devoted the preceding instalments of this article to a description of the construction and principal features of a galvanometer, it yet remains to show the manner in which the instrument is employed and mention some of the accessories which form a part of an electrician's outfit designed for the purpose of making electrical tests.

The mere deflection of the needle of a galvanometer will not, in itself, always convey practical information to the experimenter, other than to indicate the presence of an electric current. In fact, the majority of tests mean nothing definite until the deflections are killed; that is to say, until every trace of an electric current has been eliminated from the coils of the galvanometer, and the needle stands at zero.

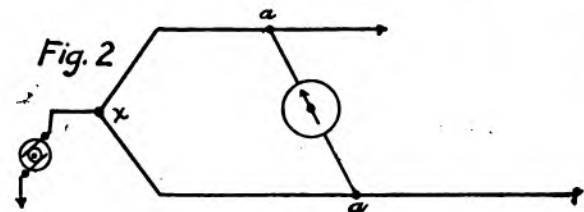
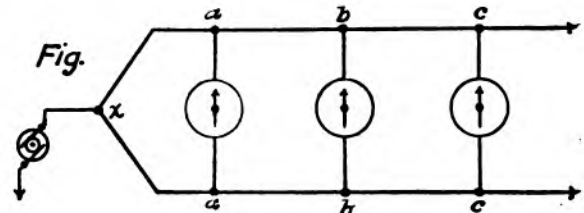
In order to contro! these deflections an additional circuit to the one to be measured must be provided, in which either the electrical pressure, or the magnetic strength of the current, due to a common battery, will exert its influence against like forces in a companion circuit. The idea, of course, being that if two conductors possess identical properties, the phenomena developed in each circuit must also be identical in kind and value. Hence, if a given force (directed towards the coils of a galvanometer) in one circuit be opposed by an equal force in a companion wire, the effect on the needle of the instrument will be nil.

In practice the galvanometer is usually placed between two such separate forces, in a circuit of its own—as the rung of a ladder joining two parallel supports.

It is quite evident, therefore, that the extra circuit must be adjustable; that is to say, capable of being shortened or lengthened as desired, and portable. An artificial line consisting of many separate coils of wire joined together, any of which may be cut in or out as desired, meets the requirement exactly; hence a rheostat is a necessary accessory of the outfit, while the peculiar construction of the one belonging to the testing outfit, or rather the manner in which the coils of the same are divided, so that the galvanometer circuit may "bridge" the two wires at an equal distance from the battery, gives rise to the term "wheatstone bridge" as the name of the device, after the inventor, Sir Charles Wheatstone of England.

Before describing this device let us study the idea which suggested the arrangement of its coils.

If a battery be connected to two wires possessing identical length and uniform diameter, a galva-



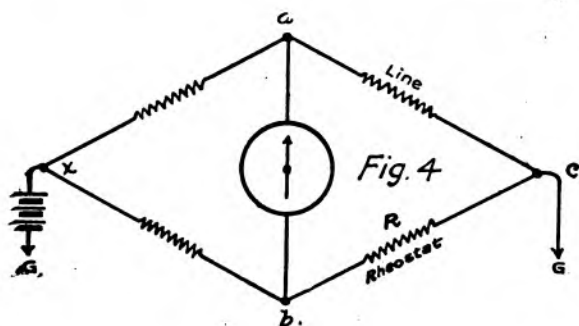
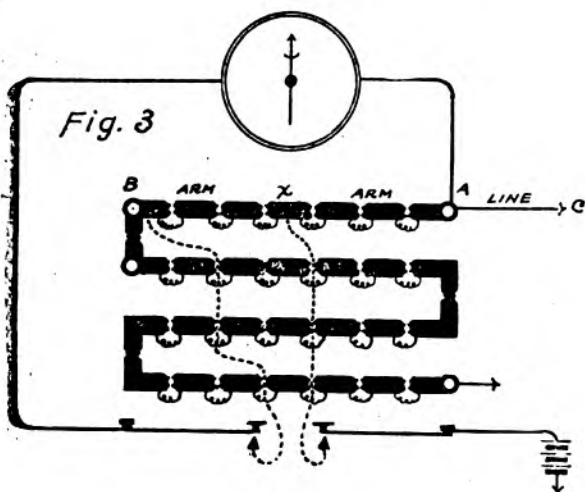
nometer "bridged" across the two circuits at any two points equidistant from the electromotive force, will show no trace of electricity nor deflection of the needle, because the electrical pressure in each circuit at such points is identical. This is due to the fact that the pressure of a battery diminishes along a line in direct proportion to the percentage of the total resistance of the circuit overcome.

In Fig. 1 the pressure drops gradually and uniformly inch by inch, because the two conductors are identical in all respects; hence the location of the bridge or galvanometer connections for "no current" are always directly opposite each other, regardless of the point chosen along the length of the conductors themselves. (See connections *a*, *b* and *c*.)

If, however, two circuits identical as to size and composition, but differing in length, be substituted for those in the first illustration (as shown in Fig. 2), the location of the equipotential points will not

be found at equal linear distances from the battery, but at such points where the percentage of resistance overcome are identical.

For example, suppose that in Fig. 2 wire No. 2 be twice the length of wire No. 1, and, consequently, possesses twice as much resistance as the latter; and that we wished to connect a galvanometer across the pair at points where the electrical pressures are of equal value. If the middle of wire No. 1 be selected for the connection of one terminal of the galvanometer circuit, it is evident that the other connection cannot be made directly across (as we view the cut), but at midway in the length of wire No. 2, because at those points the electromotive force of the battery will have overcome fifty per cent. of the total resistance in each route, and, con-



sequently, have dropped exactly half of its initial pressure.

The point we wish to bring out by the two illustrations is, that a short length of wire, say a few feet, will suffice to connect the galvanometer between such points in any parallel conductors of uniform size, whereas several miles of wire might be insufficient when the conditions are such as shown in Fig. 2.

Bearing these facts in mind, Sir Charles Wheatstone conceived the idea that if he constructed two artificial circuits of equal length, or resistance, to which the wire to be measured and the adjustable rheostat proper, respectively, might be connected as extensions thereto, he could maintain the conditions existing in the first illustration, and connect the gal-

vanometer permanently across the "bridge" or "arms" of the two circuits—all within a compact space.

The actual construction of the Wheatstone bridge, or combination rheostat, as it might be termed, is shown in Fig. 3, while Fig. 4 is the conventional way of placing the coils and rheostat before one's eyes in order to trace the windings clearly and at the same time give a theoretical view of the "bridge" with the galvanometer permanently connected in its proper place between the wire to be measured and the adjustable artificial line proper.

In Fig. 4, X—A and X—B are the two arms or sets of coils referred to as the artificial circuits to which the said wire to be measured and the adjustable rheostat proper are respectively attached. One glance at the illustration should be sufficient to show the part that these arms play in bringing about the conditions existing in Fig. 1, and at the same time show how simple a matter it is to ascertain the conductivity or ohmic resistance of a wire when connected to one arm of the bridge like that of line A—C. The diagram is self-explanatory, and in its simplicity almost gives the secret away.

The two arms, X—A and X—B, are made equal in length or ohmic resistance, hence no matter whether their value be 500 ohms or 5,000 ohms, A and B must always be exactly the same "distance" from the battery attached at X when the resistance of line A—C and that of the rheostat R are identical.

The resistance of line A—C being unknown, its value is found by altering the resistance in the rheostat by means of metallic plugs until the needle of the galvanometer ceases to be affected by the current, which divides at X and traverses both circuits. When the needle points to zero count the number of ohms unplugged in the rheostat, and the figure or figures thus obtained will represent the true value of the line A—C.

(To be continued.)

Obituary.

Martin A. Fleming, a Boston, Mass., telegraph operator, died January 3 in a hospital in Long Island, N. Y., aged 37 years. He was well and favorably known in telegraph circles, both in Boston and New York, where he had been employed by telegraph companies and brokerage concerns.

Mrs. B. O. Strong, who was formerly Miss Lizzie H. Snow, died at Plymouth, Mass., January 4, aged 58 years.

Mrs. Strong was one of the best known women telegraphers; for many years she had charge of the Western Union city lines, New York, and the Cooper Union Telegraph School was also for a long period conducted under her direction. She was one of the original members of the Telegraphers' Mutual Benefit Association, her certificate, No. 113, bearing the date of November 15, 1867.

You can't afford to be without TELEGRAPH AGE.

Miscellaneous Items.

Miss E. D. Wilkinson, manager of the Postal Telegraph-Cable Company, Cedar Falls, Ia., is spending a four weeks' vacation at her home in Ripon, Wis.

A. W. Hawker, of Manchester, N. H., has been appointed manager of the Postal Telegraph-Cable Company at Bridgeport, Conn., vice Frank Murphy, resigned.

Mr. J. H. Emerick, the well-known, old-time telegrapher, who has been seriously ill at the Seney Hospital, Brooklyn, is now convalescing, and has been removed from that institution.

Count William de la Motte, the veteran telegraph manager, stationed at Sandy Hook, N. J., who signals all incoming vessels, in renewing his subscription for another year, says TELEGRAPH AGE "grows younger with every edition."

Mr. Frank C. Mason, general superintendent of police telegraph, Brooklyn, N. Y., read a paper in Charleston, S. C., before the fire department convention in that city, on December 13. The paper was entitled "The Fire Departments of Our Cities," and was enthusiastically received.

Mr. A. V. Mann, of the Postal night force at Boston, Mass., who was admitted to the bar last year, has opened a law office in the Rodgers Building, 209 Washington street, that city. Mr. Mann has represented TELEGRAPH AGE at Boston for the past eight years; his pushing abilities have always made a favorable impression with us.

W. B. Murnan, manager of the Western Union office at Winchester, Va., in renewing a substituted subscription of his predecessor, writes: "I cannot see my way clear to be deprived of this valuable paper; no operator should be without it. Do not fail to start sending it January 1, and do not miss sending a single copy, as we look for it as we do our checks."

Veteran John Wintrup, superintendent of telegraph of the International Navigation Company, Philadelphia, Pa., was the recipient on Christmas morning of a beautiful calendar from Mrs. W. J. Bodell, of Fortress Monroe, Va., wife of the well-known old-timer and military telegrapher of that place. Dangling from the top were two infants in effigy, and Mr. Wintrup was instructed to preserve these youngsters and teach them to love their parents. As Mr. Wintrup is childless, the joke will be appreciated.

Mr. James H. Drakeford, manager of the Western Union office at Asheville, N. C., was married in Chicago on January 1, to Miss Clara Bristol, of that city. The bride is the daughter of Mr. and Mrs. Charles H. Bristol, the bride's father being general superintendent of construction of the Western Union Telegraph Company, Chicago.

Mr. Drakeford is a well-known member of the telegraphic profession, and for the past fifteen years has been identified with the service at Asheville, N. C., where he began his telegraphic career as an operator. He is one of the best known managers in Superintendent Tree's district.

The first telegram received in the Postal office at Chicago, Ill., on January 1 was from Mr. Thomas E. Fleming, special agent of the company in New York, and was addressed to Mr. E. J. Nally, of Chicago, congratulating him on his appointment as general superintendent at that place. Mr. Nally's reply to Mr. Fleming's congratulation happened to be the first message transmitted out of the Chicago office on the same date. These messages have been duly certified to by the chiefs in charge, and are now part of the history of the new century.

Personal.

Mr. George von Chauvin, of London, England, the European representative of the Western Union Telegraph Company, and general manager of Siemens Brothers, cable manufacturers, of London, has returned home, after a brief visit in the city, made in the interests of the latter concern.

Mr. Robert Atkinson, of London, England, general manager in that country of the International Cable Directory, universal edition, and the Western Union Telegraphic Code, who was recently in the United States on a combined business and pleasure trip, took occasion when here to renew many old friendships.

Resignations and Appointments.

L. B. Thompson, of the Atlanta, Ga., Western Union office, has been promoted from night chief operator to day chief operator.

Mr. C. A. Garland, manager of the Postal Telegraph-Cable Company, at Pensacola, Fla., has been appointed manager of the same interests at Mobile, Ala., vice J. P. Roberts, deceased. Mr. H. H. McLellan has been appointed manager at Pensacola, to succeed Mr. Garland.

New York Visitors.

Mr. A. C. Terry, electrician Western Union Telegraph Company, Syracuse, N. Y.

Mr. E. B. Baker, general manager of the Southern New England Telephone Company, New Haven, Conn.

OLD TIME TELEGRAPHERS' ASSOCIATION.—A full account of the twentieth annual reunion of the Old Time Telegraphers' Association, held at St. Paul and Minneapolis, Minn., on September 18-20, 1900, has been issued. It is in pamphlet form, has 112 pages, and presents such an excellent and well arranged description of the proceedings, the constitution and by-laws, a roster of the old timers and of the United States Military Telegraph Corps, together with numerous engravings of both persons and places identified with the reunion, that the members of the association will be glad to obtain copies. The compilation of the volume is due to Mr. John Brant, the secretary of the association.

The twenty-third annual meeting of the Gold and Stock Life Insurance Association will be held in Room 60, Western Union Building, New York, on Monday, January 21, at 4:30 P. M.

Magnetic Club's Annual Business Meeting.

The annual business meeting of the Magnetic Club was held at the Western Union Building, 195 Broadway, New York, on January 10, President F. W. Jones in the chair. On account of the unavoidable absence of Secretary R. E. Fagan Mr. George F. Fagan was elected secretary, pro tem. The reading of the report of the secretary-treasurer showed a total membership of 232, and a deficit of \$5 in the treasury. President Jones, in accepting the report, spoke feelingly of the benefits derived from the club, and earnestly requested all members to co-operate with him in making the ensuing year a memorable one in the club's history.

The Nominating Committee, composed of Mr. C. P. Bruch, chairman, together with other former presidents, presented, through the chairman, the following nominations for officers for the ensuing year: F. W. Jones, president; W. C. Burton, first vice-president; M. J. O'Leary, second vice-president; John Brant, third vice-president; F. D. Murphy, fourth vice-president, and R. J. Murphy, secretary and treasurer; and the following as members of the Governing Committee, to serve for two years: C. A. Benton, G. F. Fagan, R. E. Fagan and M. H. Kerner. On motion, it was voted to accept the nominations thus made.

At this point the president called M. H. Kerner to the chair, and the question was put as to the election of president. The secretary was authorized to cast a full ballot for Mr. F. W. Jones. On resuming the chair, Mr. Jones called for the remaining nominations, and, upon motion of Mr. D. W. McAneeny, the secretary was instructed to cast a ballot for those named.

Mr. C. P. Bruch suggested the propriety of establishing an honorary members' list, a proposition which called forth some discussion, but which was favorably received.

Mr. W. C. Burton moved that the chairmen of the different committees be invited to attend the meetings of the Board of Governors. This was carried unanimously. Mr. R. E. Fagan, on account of other duties, was obliged to decline a re-election as secretary-treasurer, a position he had held most acceptably during the past year.

Among those present were: F. W. Jones, C. P. Bruch, W. L. Ives, D. W. McAneeny, John Brant, R. J. Murphy, Geo. Roehm, Geo. F. Fagan, W. C. Burton, F. D. Murphy, J. F. Cleverdon, W. D. Schram, E. A. Coney, M. H. Kerner.

ANNUAL REPORT.—The Telegraphers' Mutual Benefit Association has issued in pamphlet form the proceedings of the thirty-fourth annual meeting held in New York on November 21, 1900. It is a comprehensive report of the business of the association during the past year and also since its organization in 1866. Copies of this pamphlet are forwarded to each of the members of the association, but any one contemplating joining this insurance society may obtain a copy of this work by addressing Mr. M. J. O'Leary, secretary, 195 Broadway, New York.

Business Notices.

A large pasteboard box, containing a handsome blotter pad, with corner bindings in bright red leather, together with a daily memorandum for 1901 in book form, also bound in red leather, placed at the left of and an integral part of the pad, the whole constituting at once a brilliant and useful outfit for the office desk, is being sent out by the John A. Roebing's Sons Co., of New York, to their friends, with the card of Henry L. Shippey, the treasurer of the company, enclosed.

The pocket memorandum book for 1901, issued by Foote, Pierson & Company, 82-84 Fulton street, New York, manufacturers and dealers in electrical goods, of which telegraphic apparatus forms a conspicuous part, will not only be accepted for its useful character, but admired for its artistic qualities. The cover design, executed on celluloid, and partly in color, is a fine example of high class workmanship. A few of the opening and closing pages contain printed matter of varied and useful general information. This handsome memorandum book, which is a credit to the firm issuing it, will be prized and will doubtless find its way into the inside pocket of many a business man.

As will be observed from the announcement made on advertising page eight, of this issue, the Ericsson Telephone Company, of 296 Broadway, New York, is desirous to interest telegraphers as a class in their instruments, with a view of securing among the fraternity throughout the country reliable agents, who will undertake, as a side line, the handling of these goods. By reason of their position, telegraphers frequently have excellent opportunities afforded them to sell telephonic material; many, indeed, have been instrumental at different points in organizing local operating companies, and in otherwise building up a remunerative "hello" business, several already successfully handling the Ericsson goods. To all who may be inclined to engage in business of this nature, which need not necessarily interfere with their regular duties, the Ericsson Company invites correspondence.

Recent Telegraph Patents.

Mr. F. W. Jones, electrical engineer of the Postal Telegraph-Cable Co., New York, has obtained a patent for a telegraph switchboard.

Mr. W. E. Athearn, of the electrical engineer's office of the Western Union Telegraph Co., New York, has secured a telegraphic patent on which static discharges from condensers, instead of induction impulses from induction coils, are employed to produce a more perfect method of dual transmission than has heretofore been attained.

Mr. John Burry, of New York, has been awarded a patent for a receiver for printing telegraphs. This invention consists of a type wheel having a series of circumferential rows of types, and mounted to rotate in either direction and be shifted in the direction of its length, front or back, and means for moving the same by an electric current and magnets.

OUR HALL OF FAME.

ORRIN S. WOOD.

Of the few remaining names that link the past with the present in matters pertaining to the telegraph, that of Orrin S. Wood, now residing in New York city, is deserving of conspicuous mention. He is said to be the oldest living telegrapher. The fact of his early association with Professor Morse, like that of Mr. Reid, is again a reminder that the number formerly holding such personal relations with the inventor of the telegraph is indeed a narrowing one, destined soon, in the nature of things, to pass away altogether. It is a pleasure, however, while such individuals are yet alive, to bring to the notice of telegraphers of the generations who are succeeding them, and to whom the recollection of the past, with all of the great deeds accomplished in the field



MR. ORRIN S. WOOD.

of telegraphic endeavor, is sinking into partial oblivion, to bring up in review the lives of those whose early achievements made possible the advance and conditions of the telegraph of to-day.

Orrin S. Wood, now in his eighty-fourth year, was born Dec. 14, 1817, at Sherburne, Chenango County, New York. He came of a well-known family, several members of which achieved distinction in the world of science, the late M. L. Wood, also a well-known telegrapher, and of whom extended reference was made in the January 1 issue of TELEGRAPH AGE, being a brother.

The first twenty years of Mr. Wood's life were passed quietly on his father's farm. Here he laid the foundation for that sturdy physical strength which, at eighty-three years of age, he declares to be one of his best inheritances; and where, also, under the refining influences of a delightful home, he acquired the no less sturdy rudiments of a grand char-

acter, that has ever grown in force and beauty with his advancing and ripening years.

Becoming weary, however, with the work of the farm, which held out no inducements to remain to one of young Wood's forceful character, he engaged for a period of two years in engineering operations on the Genesee Valley Canal. The invention of the telegraph, soon after, and the successful opening of its first short line in 1844, revealing therein the vast inherent possibilities of the future of this wonderful method of transmitting intelligence, awakened an intense yearning in the mind of Mr. Wood to cast his fortunes with the telegraph; to study into and identify himself with the upbuilding and extension of the new system. He accordingly went to Washington, and, in July, 1844, there became a student of telegraphy under Professor Morse himself, on the only line then in existence, extending from that city to Baltimore. For the following nine months he applied himself closely in the effort to master the subject which he had resolutely determined to accomplish. How well he succeeded in this ambition, at the same time gaining the confidence of those about him in his integrity and ability, may be judged by the fact that on March 5, 1845, entrusted with an important mission, he accompanied Mr. Ezra Cornell to New York for the purpose of exhibiting the telegraph to the business men of the metropolis, and enlisting their financial aid in its support.

In this undertaking he was eminently successful, for, in the summer of that year (1845), he was actively engaged in the construction of a telegraph line between New York and Philadelphia. This completed, he built a line connecting Utica, N. Y., with the State Fair Grounds, immediately after which he opened a line between Buffalo and Lockport. All this work, accomplished during 1845, made that year an exceedingly busy one for the young telegrapher, and established for him an enviable and well-deserved reputation for executive ability in his chosen field of life work.

During the winter of 1845-46, spent at Utica, he operated the line between that city and Albany, besides instructing a class in telegraphy. In the spring and summer of 1846 Mr. Wood established the first telegraph offices at Syracuse, Auburn, Rochester and Buffalo, which, with Albany and Utica, opened the previous year, constituted the first six offices worked in one circuit. The New York section of the New York, Albany and Buffalo Telegraph Company was not completed until the fall of 1846, when Mr. Wood came to New York, and opened the first telegraph office in this city. This office was located in the old Post Building on Exchange Place. Here he remained until March, 1847.

The varied experience that Mr. Wood had gained by this time in the carrying out of numerous enterprises entrusted to his care, undertaken frequently under the most adverse and trying circumstances incident to the time, placed him quite in the front rank as an all-round practical telegraph expert, and gained for him a wide measure of faith in and respect for his judgment. It is not to be wondered at that the services of such a competent man should be sought for outside of the boundary of his own country.

The Montreal Telegraph Company was organized in Montreal, Que., in 1847, with a capital of \$60,000. In March of that year Mr. Wood was invited to become its superintendent, a position he accepted, later assuming the general management of the company. This appointment was in every way fortunate for the new company, inasmuch as it placed a man at its head well qualified to undertake the laborious task imposed upon him. For nearly twenty years Mr. Wood remained with this company, superintending the construction and otherwise extending its lines, directing its operation and bringing it up to a high state of power and efficiency. In conducting all of this work he was closely associated with Sir Hugh Allen, a born leader of men, who became the president of the company in 1851.

The first Atlantic cable enterprise, as might have been expected, found an enthusiastic supporter in Mr. Wood, and he, together with Sir Hugh Allen and the late Peter Cooper, became an active trio in aiding Cyrus W. Field in his efforts to establish the line. Although this undertaking resulted in failure, the actual transmission of a few messages demonstrated the possibility of deep sea telegraphy over long distances, and with undaunted courage, Mr. Wood, accompanied by Sir Hugh, visited Europe in 1861, to aid in the promotion of another cable.

The concluding years of Mr. Wood's connection with the Montreal Telegraph Company were passed amid the excitement and disturbing influences due to the Civil War in the United States. The Canadian Government, at that time conducted by the Tory party, had little sympathy with the North, and Mr. Wood, who was a Northern man, and filled with intense patriotism for his native country, was frequently brought into controversy with some of those about him. After the close of the war the ten-year reciprocity treaty that had existed between the United States and Canada, and the term of which had expired, came up for renewal. Its provisions had strongly favored Canada, and the United States chafed under the one-sided conditions. Mr. Wood was requested by the United States Consul General in Canada to give, in writing, his views in regard to the renewal of the treaty. This he consented to do, with the understanding that the letter should be used for private purposes only. The fact of such a letter being in existence, although intimated, was not credited by the opponents of the Consul General, and when it was boldly declared that he held no such expression of opinion, he retaliated by producing the letter. It was so strong in its expressions against the renewal of the treaty and in condemnation of the course of the Canadian Government during the war, which had shown itself bitterly hostile to this country, that its publication provoked a great outcry. Public feeling ran so high against Mr. Wood that he promptly met the emergency by resigning his position with the Montreal Telegraph Company, although strongly importuned to remain by his immediate business associates, who highly valued his services. This was in 1866. From Montreal Mr. Wood went to Milwaukee, where he became actively interested in the building up of the Northwestern Telegraph Company. Here, as well as elsewhere, his peculiar genius for organizing and developing

telegraph property asserted itself, and at the end of two years, redeemed and put in fine shape, the property was advantageously leased to the Western Union Telegraph Company for a period of 99 years. This venture proved to be one of the most important, financially, that Mr. Wood had ever engaged in.

For a number of years, dating from 1886, Mr. Wood resided on Staten Island, where, at his home, he dispensed a quiet and charming hospitality, devoting much of his time to charitable work, and where he was, and is still, president of the S. R. Smith Infirmary, the large and beautiful hospital of Staten Island.

This sketch would not be complete without the addition of the following letter addressed to Mr. Otis E. Wood, his brother, of Ithaca, N. Y., and written by Professor Morse when residing at Poughkeepsie:

"Your brother, Orrin S. Wood, was my first telegraph pupil after the first (the experimental) line was established between Washington and Baltimore. He will undoubtedly recollect my predictions at that time for him that, having accepted the enterprise at its very commencement, and made himself thus early master of all that pertained to it, he would have an experience possessed by no other, which would enable him to command any position he might choose, not only one of usefulness, but I believed also of fortune. I am gratified in believing that he has attained a position, at least of well earned competence, if not of fortune, which he richly deserves, for his high and personal character as well as his eminent skill and perseverance."

The Syndicate Newspaper Idea of the Future.

Mr. Alfred C. Harmsworth, the well-known English newspaper publisher, now in this country, and who entertains revolutionary ideas of an extended syndicate newspaper ownership as one of the not only possible, but probable, features of journalism of the twentieth century, has received much criticism for his utterances. In answer to such criticisms a correspondent has this to say:

The press has ridiculed Mr. Harmsworth's idea of the syndicate newspaper for the twentieth century. Are the newspapers averse to the ideas of absorption and consolidation? The reorganization of The Associated Press gives some assurance that no new paper can be successfully established in the large cities. The organization of local news organizations increases the difficulties and expenses of the coalescing of the following interests into a two hundred million corporation:

The International Paper Company, controlling 80 per cent. of newspaper production.

The American News Company, controlling 90 per cent. of newspaper distribution.

The Mergenthaler Linotype Company, controlling 95 per cent. of newspaper composition.

Robert Hoe & Co., controlling 90 per cent. of newspaper printing.

Western Union and Postal Telegraph-Cable companies, controlling 100 per cent. of newspaper telegraph news.

Please remember that one New York daily has a considerable ownership in an Atlantic cable; that

another New York property controls one publication in San Francisco and another in Chicago, to which it sends colored covers and magazine features and news; that a St. Louis newspaper is vitalized by colored covers and features and news from its New York connection; that a fourth New York paper attempted eight years ago to establish a chain of papers throughout the country on the news exchange basis, and that no New York newspaper is now under nominal individual ownership. The tendency toward concentration will ultimately induce newspapers in various cities to pool their earnings on an agreed percentage, thereby enabling them to curtail expenses upon a theory that thereby they may increase profits without impairing editorial individuality or independence.

One hundred and fifty-seven newspapers of the country have combined in the American Newspaper Publishers' Association for mutual protection. The Scripps-McRae League, owning five evening papers in various cities, has ramifications and indirect interests in twenty other newspaper properties. Many newspapers have combined to stop returns of unsold copies; others have combined to employ special agents for the solicitation of advertising; even advertisers have combined to control prices for advertising.

Four iron combinations are to-day handling a business that one hundred and fifty mills formerly produced. One oil company controls a trade that three hundred individuals formerly conducted. Thirty paper mills are now run by one man. Why, then, should there be any improbability in a consolidation of, say, twenty large newspapers under a common ownership, or under a pooling arrangement which insures to such of them a given percentage of the advertising revenues of a given territory? Mr. Harmsworth has seen these things and has made natural deductions. The public that was expected to boycott department stores may be relied upon to buy and to use newspapers that give the best returns for their money regardless of any hostility to combinations.

Wants a National Telegraph.

Sir Sanford Fleming has addressed a long letter to William Mulock, Postmaster-General of Canada, in favor of a telegraph service to girdle the globe and owned by the State. The letter is said to be the beginning of a movement in Canada to nationalize the cable and telegraph service of the empire. The matter, the writer says, affects Canada as well as Australia.

The arrangement for the establishment of the Pacific cable has been completed. The arrangement implies joint ownership, and in the opinion of Sir Sanford it is the harbinger of a complete system of State-owned telegraphs by land and sea. With the telegraph system nationalized as suggested, Sir Sanford says that messages will be transmitted to and from the most distant British possessions at one-eighth or one-tenth the rates now levied by the companies. In concluding his letter the writer says:

"British subjects in Canada, in Australia, in New

Zealand, in India, in Africa, as well as in the mother country, must unite in securing complete emancipation from the grasp of the great 'cable combine.' At the threshold of the twentieth century high imperial interests demand the cheapest possible telegraph transmission and the greatest possible freedom of intercourse between all the subjects of her Majesty domiciled around the globe. I respectfully submit, therefore, that action cannot be taken a day too soon to nationalize our telegraph system by land and sea throughout the whole empire."

Publications.

"PHILLIPS' CODE," by Walter P. Phillips, 9th edition, 69 pages. This unique and efficient guide for the transmission of press reports still maintains its great popularity; bound in flexible leather; price, \$1.

"THE QUADRUPLEX," by Wm. Maver, Jr., and Minor M. Davis, 128 pages, 63 diagrams and other illustrations; treats of the technical side of telegraphy in a manner at once simple, comprehensive and easily understood; bound in cloth; price, \$1.50.

"LIGHTNING FLASHES AND ELECTRIC DASHES," 160 pages, illustrated. An original and sparkling collection of telegraph stories, quaintly descriptive of scenes and incidents that a telegrapher will appreciate and heartily enjoy; bound in cloth; price, \$1, reduced from \$1.50.

"AMERICAN TELEGRAPHY," by William Maver, Jr., enlarged and improved; 600 pages; 475 illustrations; clear, lucid and comprehensive in its treatment of the subject, the ranking work of of its kind, and of high practical value to every telegrapher; bound in cloth; price, \$3.50.

"TELEGRAPHERS OF TO-DAY," by John B. Taltavall, 354 pages. This volume, of which but a few copies of the first edition now remain, presents a compendium of illustrated life sketches of over 800 well-known telegraphers who have been prominently identified with the telegraph during the past fifty years; bound in cloth; price, \$5.

"POCKET EDITION OF DIAGRAMS AND HANDBOOK FOR TELEGRAPH ENGINEERS," by Willis H. Jones, 115 pages. 54 full-page diagrams. This book places before the telegrapher a pocket edition of diagrams designed to take the place of the incomplete drawings which nearly every chief operator, lineman and student carries; bound in flexible imitation leather; price, \$1.

"THE TELEGRAPH IN AMERICA," by James D. Reid, 894 pages, illustrated. This book is of marked interest and worth, inasmuch as it contains telegraphic records of great historical value, not to be found elsewhere. There are only a limited number of volumes of this great work now available; bound in full morocco; price, \$7.

Any of the above publications will be sent on receipt of price to any point in the United States or Canada, express charges prepaid. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

An Interesting Reminiscence of a Military Telegraph Operator.

Not the least interesting or thrilling experience of all those who are active participants in warfare is that of the military telegrapher. While he does not carry a musket or sword, he is nevertheless oftentimes thrown in perilous positions where his sense of duty compels him to meet the fire of the enemy rather than flee for safety. His fidelity to his superiors has frequently been demonstrated, and when the record of wars is finally made up much greater credit will be given the boys who remained at their instruments when bullets and cannon balls were flying all around them than was conceded during the period of hostilities.

Mr. Charles W. Hammond, of St. Louis, Mo., and superintendent of telegraph of the Missouri Pacific Railway, in speaking of his telegraphic experiences during the Civil War, said:

"My service in the United States Military Telegraph Corps commenced in the early part of June, 1861, shortly after the Camp Jackson affair. I was located at the arsenal, St. Louis. Times were very exciting then. Southern sympathizers were much enraged over the Camp Jackson episode, and any person wearing the blue uniform was a marked man. I met and messed with officers at the arsenal, some of whom are now famous in history, notably Generals Lyon, Blair, Harding, Granger and Schofield. I was particularly impressed with Gen. Francis P. Blair. He was vigilant and zealous quick of perception, quick to act—in fact, one of those men whom God creates for great emergencies and crises. He was patriotic and thoroughly unselfish. I happen to know that he was offered the command of the department, but he generously and emphatically declined in favor of General Lyon.

"For two months I was military telegraph operator at Gen. John C. Fremont's headquarters at the Brant mansion, on Chouteau avenue, St. Louis. When General Fremont was superceded I went to Cairo, and up the Tennessee River to Fort Donelson. Upon my arrival there I saw General Logan for the first time. He was then suffering greatly from his wounds received in the famous battle, which had just taken place. An Iowa colonel loaned me his horse for the purpose of inspecting the telegraph wires in the vicinity of Fort Donelson. The horse was a magnificent animal, and a great jumper. It seemed to me that he could almost scale anything. One morning I was riding him at a pretty swift gait, when in jumping a fence the saddle girth broke. Of course, I fell. I must have been unconscious an hour. When I came to the horse was standing over me, with his nose against my face. He seemed to know I had been hurt, for as soon as I opened my eyes he neighed his appreciation of that fact. While before the accident he had been spirited and prancing, after I remounted him he was as quiet and sedate as an old stager. It was the most striking exhibition of animal intelligence I ever witnessed.

"The morning after the memorable naval engagement between the Merrimac and the Monitor I was sitting at my instrument when the joyful news of the result commenced coming in. General Lo-

gan, General Oglesby, Col. Philip Fouke and others looked over my shoulder, reading the message as I wrote it down. We tried to keep it quiet at first, but somehow it got out, as all good news will, and it wasn't long before all the officers and soldiers were gathered around. General Logan stood up on a box and announced the glad tidings. I shall never forget the scene. Cheers rent the air. Officers and men hugged and kissed each other. Logan and Oglesby were almost beside themselves with joy, and were as boisterous as any of the men.

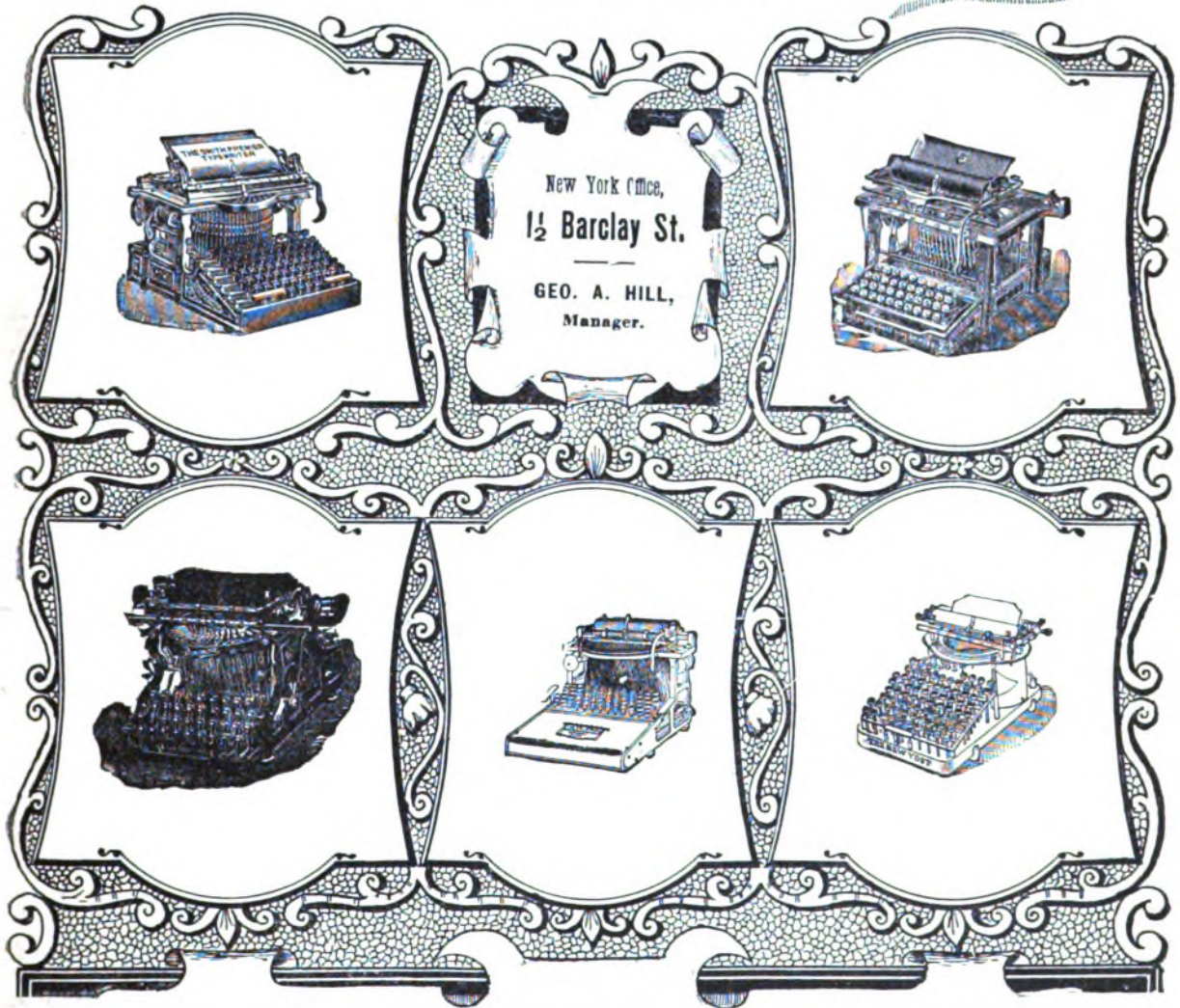
"From Fort Donelson I was sent to Pittsburg Landing (Shiloh). There I served in erecting and operating field lines to Corinth, until we occupied it. From Corinth I was sent to rebuild the line along the Memphis and Charleston Railroad to Tusculumbia, Ala., during which time I made the acquaintance of Gens. Thomas J. Wood, William Nelson and D. C. Buell. I was never more scared in my life than when I called on General Nelson for an order on his commissary for something to eat. The General flew into a rage and denounced me as 'a hanger on' and 'camp follower,' and one of the 'dogs of the war.' He abused me so that I felt my hair turning gray and made my retreat as speedily as possible. Then I determined to starve rather than accept any of his bounty. In rebuilding this line to Tusculumbia we had some thrilling experiences. We had a party of ten men on hand cars. The rebels had burned the bridges and torn away the rails in many places, and it seemed an age for us in getting through. Once we were chased by a band of guerrillas, about forty in number, for several miles, but fortunately no rails were torn up there and we succeeded in getting away from them. When I finally reached Tusculumbia and connected my instrument I ascertained that our friends had given us up for dead. They were rejoiced to hear that we got through alive.

"At Burnsville, Miss., we stopped in a vain endeavor to get something to eat, but our ability as foragers was not equal to that of the soldiers, and our success in that expedition was very inadequate indeed. There I saw a widow, who asked me for a piece of ice for her only son, who had been wounded. Luckily I had a little, and gave it to her. Such a look of inexpressible gratitude as that woman gave me! Her face was radiant with gratitude. I saw the boy, a lad of about fifteen summers. The pallor of death was already upon his face. He soon died! I was glad it was my privilege to do something in that sad case. I could not but realize the desperation of our opponents, who, in recruiting their armies, 'robbed the cradle and the grave.'

"We arrived at Iuka, Miss., tired, lame and hungry. General Wood treated us royally, providing for us bountifully out of his own stores. He gave us fine, light biscuits, like our mothers used to make—the first biscuits we had eaten for months. When General Wood appeared, wearing a large Panama straw hat, one of my men, a big Irishman, yelled: 'There goes ould General Wood wid a cow's breakfast on his head.' The remark nearly convulsed the General."

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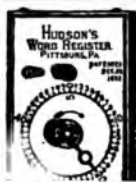
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CHANGES OF ADDRESS.—The address of a subscriber will be changed as often as desired. In ordering a change of address the old as well as the new address must be given.

NEW YORK, January 16, 1901.

To Subscribers.

Editor TELEGRAPH AGE:

Your editorial, "As to 1901," published in the issue of January 1, has stimulated your correspondent to special activity, and with what result the enclosed test of subscription renewals, together with a money order therefor, shows.

Now, Mr. Publisher, I have on my long list of subscribers the names of a good many who are slow pay; good enough, perhaps, yet giving me no end of trouble to collect from, the money frequently forthcoming only after months of weary dunning. They just make me tired. You look to me for a prompt collection of these accounts, and the exasperating delay keeps me worried and on the anxious seat. I will do the best I can, however, to effect an early collection of these subscriptions, as you desire; but I wanted you to understand the situation exactly.

* * * *

* * *, January 10, 1901.

We publish the above as a type of letter that unfortunately reaches us with too great frequency. The subscription price of TELEGRAPH AGE is not excessive, and it is not too much to expect that subscribers should meet the modest sum required with considerate promptness. It is not the single individual who may be in arrears that causes trouble; it is when the number is multiplied many times all over the country, and the aggregate amount thus becoming due assumes large and serious proportions. A little reflection on the part of our readers who have grown careless in this respect, should suffice to show them to what an extent TELEGRAPH AGE is made to suffer by their thoughtlessness.

The expenses of this journal, always heavy and constant, would be met much more easily if each individual subscriber would promptly meet his or her subscription as it becomes due. Subscribers surely

are receiving regularly the full value of their money, thus showing faithful performance toward them on the part of TELEGRAPH AGE. The obligation is a mutual one, and we trust this reference to the matter will be all that is necessary, not only to check, but to overcome an evil that has been allowed to assume too great a magnitude.

The New York Post Office Scandal.

The serious nature of the delay in the mail service in the New York post office has become of such magnitude as to cause widespread complaint and to awaken just indignation on every side. The trouble appears to affect all departments, even the registered mail!—where one naturally looks, if not for added speed in delivery, at least for extra care in its transmission—being no exception. Instances multiply in which registered packages have been held in the office for several days, in some cases a full week, before being sent out, even. This delay worked especial hardship during the holiday season just passed, and is causing no end of trouble to many business men who constantly employ the registered mail for the forwarding of certain classes of goods. Complaints are constantly reaching this office from buyers of books, etc., of the non-delivery of their purchases by registered mail, although sent by us in good faith on the date of the receipt of the order, often a week or ten days before, and for which we hold receipts. Inquiry at the post office regarding these cases revealed the astounding fact that not only had the packages not been forwarded, but that many bags of accumulated registered matter were lying unsent in heaped up piles on the basement floor of the post office!

The explanation of this unfaithful and disgraceful state of affairs, permitted in one of the most important of the great departments of the Government of the United States, is that the facilities for handling the mails are inadequate both in required floor space and clerical force. While this is doubtless true, such an explanation is in effect a terrific arraignment of the Post Office Department and of the Government itself. It reveals a scandal of the first magnitude, and all the more glaring because vitally affecting the efficiency of the chief postal center of America, the point of earning capacity that practically makes the postal service of the country possible.

The New York post office is located on Broadway, less than three hundred feet distant from the office of TELEGRAPH AGE, yet it requires nearly a week's time for the transit from that office to this of a copy of our own paper from the date of its mailing.

Arguments for Private Pacific Cable.

Apropos of what has already been repeatedly stated in our own columns regarding the Pacific cable, its construction, ownership and governmental interest therein, is well summed up by the Washington correspondent of the Brooklyn Eagle, who, after careful investigation of the entire subject, writes to his paper as follows:

"Notwithstanding the apparent intention of Con-

gress to let Pacific cable legislation rest for the time being, potent influences are at work to secure the passage of some bill before the adjournment of this session which will authorize the construction and laying of a cable to connect the United States with the Hawaiian and Philippine Islands. As stated recently, there has been nothing to indicate that such a measure would get through at this session and that the complicated status of the various cable bills made it quite probable that adjournment would occur before action was had. Additional facts to show the advantage of a cable built by private contract have recently been placed in the hands of those who favor the plan of having the government build and lay the proposed cable. The published statement that the House committee on interstate and foreign commerce favorably reported the Corliss bill, providing that the government should have control of this project, was incorrect. In reality, the committee report embraced the views of four elements in the committee. The majority report favored the Sherman bill, proposing that the contract for the cable should be let to an American company and that the government should pay to this company \$30,000 per year for twenty years for the free transmission of its messages during that period. Three members of the committee indorsed what is known as the Corliss bill, which authorized the government to build and lay the cable under the direction of a commission to be appointed by the President. Four other members of the committee merely refused to concur in the recommendations of the majority of the committee and failed to express preference for any special bill. Still another report was submitted, signed by Mr. Mann, proposing a compromise on the plan outlined in the Corliss bill. The advocates of an American cable built by private enterprise still insist that the government will fail if it attempts to establish the cable for the amount of money which Admiral Bradford says will build it. The latter is on record as saying that \$10,000,000 will build such a cable, while the other side contends that a duplicate cable would involve the expenditure of at least \$20,000,000. It is contended that the survey of the Pacific for a cable route made by the *Nero* did not afford data sufficiently reliable to warrant the laying of a line, and that further investigation would have to be made in regard to depths, bottom, etc. Opposition to the government plan is further developing from those who are concerned in the \$200,000,000 of American capital now invested in telegraph property, all of which would be affected by a government line doing commercial business."

The Pacific Cable at Last—But British.

It is officially announced by the Colonial Office, in London, that the Pacific Cable committee have accepted, on behalf of the English government and of the governments of Canada, New South Wales, Victoria, Queensland and New Zealand, the tender of the Telegraph Construction and Maintenance Company, of London, for the manufacture and laying of the projected Pacific cable. The amount of the tender is \$8,975,000, and the work is to be com-

pleted by the end of 1902. The cable will run from Vancouver, B. C., to Queensland and New Zealand, *via* Fanning Island, Fiji and Norfolk Island. The total length of cable will be considerably over 7,000 miles, and the stretch from Vancouver to Fanning Island—approximately 3,500 miles—will be the longest cable in the world. The section from Fanning Island to Norfolk Island will be about 1,700 miles, from Norfolk Island to Brisbane 800 miles, and from Norfolk Island to the coast of New Zealand 500 miles. In all the earlier British Pacific cable schemes Honolulu was selected as the landing place of the first section, but on the annexation of the Sandwich Islands by the United States this was, of course, impossible, seeing that the cable was "all-British." The contingency of American ownership of the Sandwich Islands was, however, foreseen as far back as 1888, and in order to provide against it Fanning Island was in that year annexed to the British Empire. The new Pacific cable, which will form the longest link in the all-British telegraph route to the greatest of the British colonies, is the most important undertaking of the kind ever carried out under a single scheme. The other long-distance cables were mostly carried out in sections from time to time, as the necessities of commerce demanded. The exceptions are the trans-Atlantic lines and the recently laid cable from the Cape *via* St. Helena. In length the Pacific cable will be the longest direct wire in the world, as it will cover a distance of nearly 9,000 miles in all. The manufacture of such a vast line is in itself a big task, and will occupy the greater portion of the time allowed for the establishment of communication. The actual work of laying these long cables is by no means so difficult as it was in the days when the *Great Eastern* steamed across the Atlantic with the first American cable. Improved methods and machinery have reduced what was formerly a most serious undertaking, accompanied by much risk of failure, to practically mathematical certainty.

Value of Telegraphy.

Telegraphic communication and its value was recently illustrated by the receipt by mail at Washington of a copy of a telegram from Fort Egbert, in the Yukon Valley, Alaska, below Dawson City. The telegram itself came by wire to Skagway, thence by steamer to Seattle, and to Washington by wire, reaching the Signal Corps office in that city four days from its writing. On one other occasion, by making better sailing connections, a record of three days was established. The mailed copy required forty-three days for transit. A few years ago the United States spent over \$200,000 on an expedition to carry relief to alleged sufferers in that country. The Signal Corps officers point out that all of this sum, besides much hardship to those on the expedition, could have been saved had such telegraphic means been in existence at the time.

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

Progress of the Century.

In 1800 communication between remote points was only by mail, and the mail was slowly carried by post horses and sailing vessels. To hear from friends in Europe required many months of delay. To-day we communicate with Europe by cable in a fraction of a minute and talk over the telephone with friends a thousand miles away. In 1844 the first line of telegraph was built, under the direction of Prof. Morse, between Baltimore and Washington, by special appropriation of Congress, and the first message over it—"What hath God wrought"—was prophetic of a mighty revolution in the world's life. To-day one great company—the Western Union—has 933,153 miles of wire, 22,900 offices, and in the current year sent 63,167,783 messages. Add to this the equipment and business of the Postal Telegraph-Cable Co., and the total would be 1,108,153 miles of wire, 25,900 offices and 80,667,783 messages. Even these figures must be increased somewhat by small companies, the fire-alarm and the district messenger service, while submarine cables to the number of 1,500 add 170,000 miles of line and 6,000,000 messages annually in extension of the business of the United States. It is appalling to think how helpless we would have been in our campaigns in the East, and how little hope there would have been for the lives of our compatriots in Pekin, had there been no cable. The telephone, invented by Prof. Bell in 1876 and immediately introduced, utilized in 1899 in the hands of one parent company a million and a half instruments and over a million miles of wire, and in that year more than five million connections were made daily. The telegraph and telephone are the great distance annihilators and time-savers of the nineteenth century, and enter into the life of almost every other industry. They are both American inventions.

In the electrical world progress has been made chiefly along familiar and well established lines during the past year. Considerable advance has been made in telephony and telegraphy, and more particularly that branch of the latter which is associated with the name of Marconi and his fellow workers. Marconi's efforts have been directed more to synchronizing his messages and constructing a transmitter, the messages from which can be recorded only by the apparatus which has been tuned to receive them, and he appears to have successfully solved the problem. The Pollak-Virag rapid electric and photographic telephonic system is reported to have given phenomenal results, notably in a test between Berlin and Ofen-Pest, when a message of 220 words was transmitted in nine seconds, but the development of the sensitive paper requiring between four and five minutes. Another most important development is to be recorded in Dr. Pupin's system of long distance telephony, in which, by the introduction of inductance coils, it is possible to make an extraordinary increase in the distance over which telephonic messages may be sent. Dr. Pupin established the correctness of his theories by means of 250 miles of artificial lines arranged with inductance coils. Another notable

contribution to telegraphy is that of Donald Murray, an Australian inventor, whose high-speed page-printing telegraph, an invention that has been purchased by the Postal Telegraph-Cable Co., has shown a capacity, with the Morse telegraphic key, of fifty words, and using the Phillips code, of sixty-five to seventy words per minute. The Paris Exposition served to introduce to the public the Poulsen telephone, in which magnetic pulsations are caused to act upon a steel wire, and the magnetization as thus effected is conversely caused to act upon the telephone receiver and to reproduce the original sounds.—Scientific American.

Two Miles of Wires for One Dollar.

Two miles of wires, said to belong to the Postal Telegraph-Cable Company in the town of Union, Hudson county, N. J., were sold at auction December 28, for taxes amounting to \$151.70, which it is claimed the company owes. The wire, which is strung on poles of the Hudson Telephone Company, was knocked down for \$1 to Charles Singer, town clerk of Union, who bid personally and not as an official.

When asked if he was going to start a new telegraph company, Mr. Singer said he guessed not, but was in a peculiar position. He said: "The wires are mine. I have paid for them. The township in accepting my money placed itself in a position where it is bound to deliver those two miles of wires where I can take possession of them. If it does not, it seems to me I can sue the town for breach of contract. Just how the town is going to deliver the goods to me I cannot say. The Postal wires are somewhere amid a big maze of telephone company's wires. It seems to me it will be necessary for the town to find out which wire belongs to the Postal Company. To do that it will require the use of experts, not only as linemen, but who can tap the wires to see whether dots and dashes or spoken words are passing over them. To ascend the poles of the telephone company would be trespass. To cut a wire which is not yours is a criminal offense; hence, if in searching for my wire the men cut a telephone wire their fate would be state prison or the penitentiary at least. I don't see how the town is going to deliver that which I have paid for, but I am considering the advisability of offering the telegraph company the use of the wires at a nominal rate and let them stay where they are."

THE TELEGRAPHIC HISTORICAL SOCIETY OF NORTH AMERICA. A pamphlet of 32 pages, containing a report of the proceedings of The Telegraphic Historical Society of North America at the annual meetings of 1898, 1899 and 1900, the first two held at Washington, D. C., and the latter in New York, has been published. Mr. J. B. Taltavall, the secretary of the society, has had charge of this compilation and it presents in carefully arranged form much matter of a nature that will be of interest to a wide circle.

Why don't you subscribe for TELEGRAPH AGE?

PARCEL POST AND GOVERNMENT TELEGRAPH.

BY JOHN DOUGLAS KING,
Chief Inspector New York Post Office, in the New York
Herald.

Just one hundred years ago this year the first post office directory was compiled in England. At that time, both here and abroad, letter writing was an expensive pastime. The postal rate depended on the mileage, whether by coach, pony and boy or pigeon. It cost six times as much to send a letter to Albany from New York as it now costs to Alaska.

And yet I foresee great improvements in the service, for not only is the end not yet, but all that has been accomplished I believe to be a fair beginning. Other countries are leading us in many ways. For instance, take the parcel post, which has proven such a success in England and on the Continent. The service has been very cheap and efficient under wise administration; and early in the twentieth century I predict that America will have added this important branch of parcel post.

Another great opportunity for improvement is the postal savings bank, which is such a grand measure for the protection of the poor of all Europe.

And this naturally leads to the adoption of the sister enterprise of the postal service, the telegraph. Government ownership of the telegraph has proven in European countries a very wise measure, and I predict its adoption here. More than that, I doubt not that before the century closes there will be United States government cables to all parts of the world, in conjunction with the government mail and telegraph system, so that all means of communication will be in government hands.

I even think that the vast volume of business will admit of a reduction in the postage to one cent per half ounce instead of two and all rates corresponding.

We transmit mail at a furious rate under ground and above ground. Why not also through the air? After such a marvelous century as the last has been, who dares say what shall not be accomplished in the coming one?

I believe further that during the coming year the pneumatic tube system will be utilized in carrying the mails from post offices directly to business houses, banks, hotels and professional men. Thus upon the arrival of letters for such firms at the post office the same will be dispatched immediately to the addressees.

From Operator to Strike Leader.

M. M. Dolphin, president of the Order of Railway Telegraphers of North America and leader in the strike of the telegraph operators on the Santa Fé, is an interesting character, says the Kansas City Times.

He has worked his way to the top, and the fact that he is a self-made man is probably the reason everybody likes him. Ask any one who knows Dolphin for an opinion of the man and he will say: "Dolphin is a good fellow, a great fellow. If he's your friend he'll die for you."

Ten years ago Mr. Dolphin was a night operator in the telegraph office in the Union Depot in this city. There was not much to do after the midnight hour, and Dolphin secured a few law books, which he began to study. He was admitted to the bar about eight years ago, and soon after was sent as a delegate to the annual convention of the telegraphers, which was held in Denver.

Dolphin was the only lawyer in the convention, and, charges having been preferred against the president of the order, he was asked to represent the order in the prosecution of the charges. He made such a good impression that he was elected first assistant grand chief at that convention. Four years later he was made general counsel for the order, and was also elected first vice-president of the organization at its recent convention in St. Louis.

Dolphin came into prominence about four years ago when he prosecuted a suit against the Union Pacific Railway Company. For years this corporation had been making a regular monthly assessment on all its employes, which was devoted to a hospital fund. The railway company never gave an accounting for this money, and Dolphin, on behalf of the employes of the road, brought an action in the United States Circuit Court of Omaha to compel the railway officials to account for all the money that had been collected and to make a statement as to the amount of money that was then placed to the credit of the hospital. It developed that there was a surplus of \$175,000, and the United States Court rendered a decision compelling the railway company to return this money to the men who had been forced to donate it. An appeal was taken to the United States Circuit Court of Appeals, and the decision of the lower court was affirmed.

There is a story told of Dolphin in connection with this case. After he had won it he presented a claim of \$1,500 for attorney's fees. He was allowed \$700, and went before Judge Caldwell and asked for more.

"I think \$700 is a reasonable fee for a young man like you," said the judge.

"I don't think so," replied Dolphin. "This is one of the greatest courts of justice in the world, and the judge of this court should be one of the most dignified judges in the world. He must be a recognized authority on all legal points. A lawyer who practices in this court has to be an able man in his profession. Therefore, I think an attorney who would accept a fee of \$700 for prosecuting a suit in this tribunal would be subject to contempt of court, and ought to be fined."

The blarney won the point, and Dolphin got his fee raised.

The annual report of the Board of Regents of the Smithsonian Institution, Washington, D. C., for the year ending June 30, 1898, has made its appearance. It is a large volume, illustrated, of over 700 pages, and, in addition to the secretary's full report, contains a large amount of miscellaneous matter, much of it of a highly interesting, scientific and geographical nature.

Subscribe for TELEGRAPH AGE, \$1.50 per year.

THE TELEGRAPH.

BY PATRICK B. DELANY.

Although the electric telegraph had been hinted at a century or more before, it may be said that Morse, of America, and Steinheil, of Bavaria, began Morse in 1837 made his first demonstration at the almost simultaneously to make a practical method, University of New York over a third of a mile of wire strung around a room, and a year later, with the help of the superior science of Joseph Henry and the mechanical skill of Alfred Vail, ten words per minute were transmitted over ten miles of wire at the same place. Henry, it must be remembered, rang an electric bell through a mile of insulated copper wire, similarly strung, seven years before. Morse began with what might be termed a short line recorder, using combinations of dots requiring a code book for preparing and transcribing messages. Henry had invented the long line instrument, Vail conceived the embossing register and, with or without Morse's help, supplied what is known to-day as the Morse code of dots and dashes.

Upon this foundation the system grew, until six years later, when the first practical telegraph in this country was put in operation between Baltimore and Washington.

The apparatus was crude and clumsy, but all the elements essential to success were there. In fact, about all that has been done to the Morse apparatus since has been by way of refinement and cheapening. The sounder has taken the place of the recording instrument and the trained ear and nimble fingers of the operator have raised the possible speed from ten to fifty words per minute, the average being below twenty, however.

After the Morse came the House printing instrument, which, considering the time, was by far the most ingenious combination of electro-magnetic-mechanical effects ever produced, and compared with which the work of others appears very simple.

After this instrument had been perfected and put into successful operation the inventor went back to his farm in Vermont, and after twenty years or more emerged from his seclusion with a wonderful conception which he had thought out in the furrow as he followed his plow, and worked into shape when the candle was low. He brought this machine to Brooklyn seventeen or eighteen years ago and showed it in experimental operation. The patents covering it have been "bunkers" in the game of telegraph invention ever since, affording at the same time a convenient "reference" for the Examiner at Washington for suppression of over enthusiastic inventors in this field. It is easier for the inventor to contrive a new departure than to argue House's "references" with the Examiner, neither of them having any clear understanding of its operation.

House's new machine was designed to operate on a selective plan and drop off printed messages at any station desired at a speed of about sixty words per minute, and to lock stations in and out of the line obediently to the operator's will. He invited

his old contemporary, D. H. Craig, to witness the operation of his machine.

Craig saw it, and then took House over to the American Rapid Company's office, in New York, and showed him how messages were being sent between New York and Boston at several hundred words per minute. The old inventor soon after packed up his symposium of intricacies and went back to his farm. He died at Bridgeport five or six years ago, having worked half a life time with marvelous genius, apparently oblivious to the strides of improvement abroad in the land.

Hughes printer has been extensively used for about out of use Hughes brought out his printing telegraph, in a measure a modification of House's machine, and this was followed later on by Phelps' combination of the two, but the more simple and comparatively inexpensive Morse system usurped the field in this country.

In Europe, on the Continent especially, the Hughes printer has been extensively used for about thirty years and brought fame, fortune and honors to its inventor, whose most noteworthy achievement besides was the discovery of the microphone.

In England Cook and Wheatstone were pioneers in practical telegraphs. The A B C dial instrument, the single and double needle, and the fittest survival of the lot, the Wheatstone automatic system, which to-day is carrying all the press matter and a good portion of the regular traffic for the British post office, are good testimony of the genius and industry of these co-workers.

About 1868 J. B. Stearns, of Massachusetts, duplicated the Morse system, making one wire about equal to two in carrying capacity. A year or two later Edison invented the quadruplex, and had this been the only achievement of his fertile brain it should entitle him to everlasting distinction. This quadruplex system is used most extensively in this country and England. According to a statement made several years ago by the late Norvin Green, at the time President of the Western Union Telegraph Company, the artificial or "phantom" circuits, created by the quadruplex, represented in value over ten million dollars to that company alone.

In 1884 the Delany synchronous multiplex system was perfected. It has not been used in this country, but was adopted by the British post office in 1885 and has been extensively used on all the leading routes in that country up to the present time. By it six Morse circuits are obtained over a single wire and all may be worked in one direction, if required, the circuits, unlike the quadruplex, which permits but two transmissions in one direction, being as independent of each other as though six wires were used.

The Morse, Wheatstone and Hughes may be said to do the world's telegraphy at present. Each has been improved from time to time, both as to speed and distance of working, and the improvement in lines has contributed largely to their increased efficiency as well.

All these systems are based upon electro-magnetic effects. Without the electro-magnet not a single dot could be sent over land or sea nor a

single word spoken by telephone. Even the wireless system of Marconi is dependent on Oersted's discovery. It disclosed the foundation for all electrical development, of which the telegraph was the forerunner.

Until Steinheil discovered that the earth would answer for the return half of the circuit he and Morse used two wires—one for sending, the other for receiving messages. Steinheil, in trying to utilize the two rails of a railway, found his transmitter short-circuited, and when one of Morse's wires, between Washington and Baltimore, broke down, he found that work went on just the same.

Up to 1876, when Bell exhibited his telephone at the Centennial Exhibition, no one dreamed that the telegraph would ever have a competitor in the field of electrical communication. Indeed, for several years after the telephone became a far speaker it was snubbed and scorned by the telegraph magnates. It was offered to them, lock-stock-and-barrel, for less than the price of a good race horse, but overconfidence begotten of monopoly, and prejudice allied to short vision, forced it to set up for itself. Its growth is known to everybody.

This invention by Bell and the wireless system of Marconi stand as the two great departures in electrical communication since Miss Ellsworth's message, "What God hath wrought." Like Morse, Bell and Marconi have had their forecasters—purveyors to the architects, as it were.

The state of the art of electrical communication to-day may be summed up as follows:

Telephony	60 words per minute
Single Morse Circuits.....	15 words per minute
Duplex Morse Circuits.....	30 words per minute
Quadruplex Morse Circuits..	50 words per minute
Multiplex (six circuit)	80 words per minute
Wheatstone Automatic	125 words per minute
Wheatstone Automatic Duplex	200 words per minute
Wireless	10 words per minute

These facilities, keeping in mind the restrictive charges, are ample for the amount of traffic offered. Increase of business can only be handled by increase in the number of wires, but this condition and its continuance falls far short of the legitimate demands of the present, and offer no relief for the future.

The present systems will not admit of any material reduction of rates. The average 30-cent 10-word telegram, and the dollar per hundred miles five-minutes' talk by telephone, under most careful management and present capitalization, will not yield over 5 or 6 per cent. dividends. Thus far the telephone has derived its great profits from local exchanges and rental of long circuits for private use. The private line business of the telegraph companies is to them the most profitable also. Combined, the telegraph and long-distance telephones do only about 5 per cent. of the correspondence numerically, and probably not more than 2 per cent. in volume, and their total yearly earnings (exclusive of local exchange business) is less than one-half the amount realized by the post office from the sale of stamps for first-class matter.

Letters average about 30 for each inhabitant. Postal cards 7. Telegrams 1½.

Undoubtedly before the new century is ten years old, at least one-half of the correspondence, now carried by train, will be telegraphed, at an average rate for the whole country of 15 cents for 50 words, or five times as many words for one-half the present telegraph toll.

It is practicable to begin this change at once, but not by present methods of operation. It is only possible by the chemical automatic system.—Electrical World and Engineer.

(To be continued.)

CABLE MANUFACTURE IN THE UNITED STATES.*

BY WM. MAVER, JR.

The metal used for the conductors of underground electric cables is copper. Practically the only rival of copper for electrical purposes, outside of iron for overhead telegraph lines, is aluminium. This rivalry, however, extends only to overhead wires where the matter of diameter of the wire is not very material, the diameter of an aluminium wire being 1.27 times greater than that of a copper wire of equal conductivity. The weight of an aluminium wire, on the other hand, is one-half that of a copper wire of equal conductivity. At the present price of aluminium, which is slightly less than one-half that of copper, it would, therefore, be economical to use aluminium wire for overhead purposes, and this has been done recently in several instances. For underground purposes, however, it would seem that the greater diameter of the aluminium wire for a given conductivity must place it at a disadvantage, as compared with copper, on account of the greater amount of insulating material and lead required to cover the aluminium wire. The increased space that the latter wire would occupy in the underground ducts, where space is often quite a serious consideration, is also a disadvantage.

The process of manufacture of the cable may be taken up at the wire factory, where the copper is received in billets, or ingots, weighing about two hundred pounds, which are first rolled into rods by rolling machines or mills. The ingots while red hot are passed through roll after roll, the rolls gradually reducing the wire to a desired size. In the first stages the rods are passed back and forth by men on each side of the mills, but as the rod increases in length and diminishes in diameter, it is passed from one set of rolls to another by curved guides. These rolls will break down fifty tons of copper per day of ten hours from the ingot to a rod or wire equal to No. 5 B. & S. gauge (No. 7 B. W. G.). This process, however, does not leave the wire as uniformly round as desired; hence the rods are usually subjected to a "drawing" process, which consists in drawing the wire, while cold, by means of suitable machinery, through dies of hardened steel. It is usually necessary to repeat this drawing process several times with dies of gradually

*Abstract of an article on "Electric Cables for High-tension service, How They are Made and Tested in the United States," in Cassier's Magazine.

diminishing diameter, until the desired gauge of wire is finally reached. The drawing process hardens the wire and also materially increases its strength; at the same time it renders the wire less pliable. The strength of the copper wire thus hardened appears to rest very largely in a thin shell formed by the drawing process, for when the shell is nicked, even if only very slightly, the wire breaks readily at that point. Before each drawing the wire is covered with flour paste, baked on the wire in an oven. This acts as a lubricant while the wire is passing through the die. When the wire has been drawn to the desired size, it is annealed to the required degree of softness and pliability by heating, the extent of the annealing depending upon the use for which the wire is designed. For the conductors used for overhead telegraph and telephone purposes, it is not annealed after the final drawing, or but very slightly, and this wire is termed "hard-drawn." But for larger wires, such as No. 00 or No. 0000 B. & S. gauge (0.364 inch and 0.460 inch diameter, respectively), the wire is always "soft-drawn." The wire used in cables is always soft-drawn, regardless of the size, to insure flexibility.

The wire being thus reduced to the desired diameter, the treatment which it will next undergo will depend on the nature of the insulating material with which it is to be covered. If a rubber compound is to be used, the wire will be tinned, it being supposed that this is a protection against any possible deleterious effects of the sulphur used in vulcanizing the rubber. The tinning is effected by passing the wire through a vat of molten tin. When the insulating material is fiber or paper, the wire is not tinned.

The wire is now practically ready for use in the cable. There is, however, another matter to be considered first; that is, whether the conductor of the cable is to be "solid" or stranded. When the diameter of the conductor does not exceed 0.257 inch diameter (No. 2 B. & S. gauge), the conductor is usually solid; that is, it consists of one wire. Above this size the conductor is stranded, chiefly to obtain greater flexibility of the cable.

The work of stranding the wire is usually done in one process. The wires of the strand are wound on reels, which are placed on suitable spindles, on frames around the stranding machine, the reels for each layer of wires being in the same circle. The circle of reels for each layer is, of course, placed a suitable distance behind or before its neighboring circle, the reels for the larger layers being, naturally, behind those of the smaller. The center wire of the strand passes from its reel, which is stationary in one place, and is held taut by a take-up drum or reel. The wires of the first layer are wound around this wire, and the wires of the second layer are wound snugly around the first layer, and so on, the reels of contiguous layers of wire being caused to revolve with their respective frames in opposite directions, which gives the respective layers of the strand a right and left-hand lay. Machines for such work may be designed to carry one hundred and thirty reels of wire, weighing 1,000 pounds each.

As previously remarked, the insulating material

of high-tension cables is now either a rubber compound or paper saturated with a resinous oil. Gutta-percha, which has been used so extensively—in fact, it may be said, exclusively up to this time—as the insulating material for long submarine cables, is not used at all for high or low tension cables in cities, its low melting point, about 120° F., being fatal to its employment for such purposes, inasmuch as this temperature is frequently encountered in city streets. Indeed, a temporary overload of a conductor might raise the temperature to this point, in which event the conductor would settle to the lead armor or sheathing of the cable, thereby, of course, ending its usefulness.

The pure rubber used in the rubber compounds employed as an insulating material is brought to the factory in balls, which weigh from five pounds to sixty pounds. While this is termed "pure rubber," it is quite impure in a strict sense, and during the purifying process it undergoes a shrinkage of about 20 per cent. The first step in its preparation consists in soaking for about twelve hours in water at a temperature of about 200° F. or 212° F. After undergoing this boiling process the ball is passed through corrugated rolls or mills, by which the rubber is pressed into a thin rough sheet about the size of a sheep's hide. As the rubber is thus passed and repassed through this mill streams of water are caused to fall upon it, washing away the impurities which the roller exposes. After the sheets have been thoroughly washed they are taken to a drying room, where they are usually kept for two, three, or more weeks. The sheets are then taken to the "break-down" mills, where they are passed repeatedly through rollers which are kept at a temperature of about 200° F. This reduces the sheet to a homogeneous, plastic mass of pure rubber. The rubber is then folded into thick sheets and passed into the mixing room. Here, as the pure rubber is passed time after time between the rolls, the attendants add the ingredients, which make the completed compound, in such proportions as may be deemed advisable for any particular case, the proportion of such added ingredients, or adulterants, and pure rubber varying with every manufacturer.

The ingredients composing a well-known rubber compound are as follows: Fifteen pounds Para rubber, four and a half pounds litharge, six pounds whiting, four and a half pounds blue lead, seven ounces sulphur. The amount of pure rubber used in the better classes of cable varies from 35 per cent. to 50 per cent. The various ingredients are added gradually to the rubber during the process of mixing, which requires for its proper operation a high grade of shop skill. The mills are kept at a temperature of about 200° F. during the process. In the mixing room of one large manufacturing company 6,000 pounds of the insulating compound are prepared in a day of ten hours.

(To be continued.)

A subscription to TELEGRAPH AGE is one of the best investments a progressive telegrapher can make; it keeps him thoroughly posted.

Tesla Confident of Telegraphing to Mars.

Nikola Tesla in his recent experiments in atmospheric electricity obtained results which he believes will make possible communication with the people of Mars. Scientific investigators abroad were sceptical as to his new theory. Professor Fleming, F. R. S., of University College, London, laughed outright at the idea. Mr. Marconi, who is experimenting in wireless telegraphy near Pool, attributed the alleged signals from Mars to local disturbances in the atmosphere.

Following is Mr. Tesla's reply to his critics and his explanation of his theory:

"Having no exact knowledge of the means of investigation used by other experimenters, I cannot judge of the value of their observations. I assume that the same circuit arrangements and devices have been employed which are described in patents and articles on Hertzian telegraphy. In these cases an aerial conductor, not directly connected with the ground, but separated from it by imperfect contacts or coils which prevent the passage of the current, receives the effects transmitted from a distance.

"The atmospheric disturbances in these arrangements, if I am to judge from my own experience, are so great that I have always doubted their practical value. In my investigations these disturbing atmospheric influences were almost wholly excluded. It would have been impossible for other experimenters to note the effects which I have discovered, for with the Hertzian devices only a very narrow region can be explored, whereas I was able to observe the electrical condition of a large portion of the globe, a stretch of land 2,200 miles in width and breadth. That these actions are due to causes heretofore unknown I am convinced.

"I feel that I have not been led away by my imagination, but that my sight was true as ever before, and I am confident that future investigation will confirm my statement.

"Nor have I the slightest doubt, judging from my experiments and measurements, that with a properly constructed electrical oscillator an amount of energy can be transmitted to a planet, as Venus or Mars, even at their greatest distance, sufficient to bring into action a sensitive instrument, such as I have been using in my own observations.

"Furthermore, it is an error to believe that a great expenditure of power is necessary for interplanetary communication. What is needed is an effect specifically great—an enormous rate of energy delivery, but lasting each time only a fraction of a second, so that the total power used up is small. Now, with my oscillator I can make this rate equal to five million horse power and more, if necessary, and my calculations show that a small fraction of this rate is amply sufficient for conveying a message to Mars.

"Heretofore light was the only known agent for communicating with a planet. It is easy to show that by its means such a result is virtually impossible, owing to the rapid diminution of energy with the distance and the impossibility of concentrating in an instrument the energy falling upon a large area. By the method and machinery I have de-

vised we are enabled to convey an immeasurably greater amount of energy to the planet, and the observer there, instead of utilizing in his instrument only an infinitesimal amount of the entire energy conveyed, can avail himself of a large portion of the same.

"A practical solution has thus been found both for transmitting and receiving messages, and we can only hope that there are beings as far advanced, and possibly further than we are ourselves. I see no harm in holding fast to this possibility. This thought cannot but make us better and give us a fresh interest in life."

The New York Chamber of Commerce Favors a Private Pacific Cable.

The New York Chamber of Commerce at its regular monthly meeting, held January 3, unanimously adopted the report of the Committee on Foreign Commerce in regard to a transpacific cable. The report recommends that the cable be laid and maintained by private enterprise because of the first cost of laying the cable and the cost of annual maintenance. The committee thinks that the Government could not profitably undertake this work, as the cable in order to be commercially profitable and useful would have to go to China and Japan. A United States Government cable would probably not be permitted to land in those countries, the members say. The report makes lack of experience another obstacle for the Government.

In advocating private ownership the report calls attention to the bill introduced in the House of Representatives by Congressman Sherman. This bill authorizes the Government to contract with an American cable company for the annual payment of \$300,000 for a term of twenty years for the transmission of official messages, and gives the Government authority to take possession of the cable in time of war, rebellion or other emergency.

Pioneer Telegrapher.

Col. Lemuel F. Shelden, who retired as assistant superintendent of telegraph of the Missouri Pacific on January 1, on account of the abolition of his office, as recorded elsewhere in these columns, is a pioneer in the field of railroad telegraphy. He was the first operator to work a key west of the Mississippi and he established an office in Kansas City when that city boasted but three stores. During the civil war he had charge of the government telegraph lines on the Atlantic coast, and for his services was brevetted lieutenant-colonel. Later he was associated with many famous Union generals.

Colonel Shelden is now 68 years of age. For the past eighteen years he has been with the Gould system, and for many years had headquarters in Sedalia, Mo., in charge of the telegraph work on the western lines of the Missouri Pacific. During the time between the end of his government service and his entrance in the employ of the Gould line Colonel Shelden was identified with a number of railroad and commercial enterprises.

Send for a sample copy of the next issue of TELEGRAPH AGE.

LETTERS FROM OUR AGENTS.**To Our Agents.**

While we are desirous to receive from our agents letters for publication respecting their various offices and their personnel, for all efforts of this character are appreciated, we would earnestly request that such communications be confined strictly within the limits of the subject, and not so much space be devoted to hunting and fishing items and other extraneous matter, as is frequently the case. We wish to make the department of "Letters from our Agents" an attractive one, but if we were to publish all that comes to us in the shape of irrelevant matter, of no possible interest to the general reader, it would frequently require us to surrender a number of additional pages to contain it all. The current information of any office will, if carefully chronicled, furnish a welcome digest of news that will be read with pleasure and satisfaction by thousands, and this limit should be the legitimate contents of all letters.

Southern Pacific Telegraph System—Coast Division.

Although not as extensive a division in regards to miles of road, it is safe to say that there is not a division of the Southern Pacific which reaches so many points of interest as this one.

Starting at San Francisco and running almost due south, Stanford University, the beautiful Santa Clara Valley, San Jose, whence stage is taken to Mount Hamilton and the famous Lick Observatory, the noted summer resorts of Santa Cruz and Pacific Grove, the famous hotel and grounds of Del Monte, the great Salinas Valley, the extensive tunnels through the Santa Inez mountains, all combine to make it one of the most important branches of this system.

The Coast Division, with J. L. Frazier as superintendent, at San Francisco, consists of the extensive suburban system of Alameda and Oakland in connection with the ferry, the narrow gauge line to Santa Cruz Mountains and the famous Big Trees, the main line, San Francisco to Surf, which probably before this article is in print will be connected and trains running through to Los Angeles via Santa Barbara and the New Almaden, Pacific Grove and Boulder Creek branches. About one hundred and forty suburban trains and seventy main line trains daily are controlled from the chief dispatcher's office at Third and Townsend streets, San Francisco.

The head of the telegraph department of this division is E. A. Steininger, train master and chief dispatcher. Mr. Steininger, with his small but well selected corps of dispatchers, are men whose years of experience on such roads as the Pennsylvania, Missouri Pacific, Union Pacific and Southern Pacific has made the art of handling trains second nature to them. Most of them have seen service with the different commercial companies and are thoroughly qualified in every way to fill the important positions held by them.

Mr. Steininger was born in Jefferson City, Mo., in 1858, and commenced his telegraphic career as night operator for the Missouri Pacific at that point at the age of eighteen. After six months'

service, he was promoted to the dispatcher's office at Sedalia, Mo., where he served three years. In 1880 he came westward and found employment in the dispatcher's office of the Union Pacific at Laramie, Wyo. Later he worked for the Santa Fe at Argentine, Kas., and for the Western Union Telegraph Company in St. Louis, Kansas City and other places. In 1855 he commenced work for the Southern Pacific Railroad as operator at Tulare, and by close attention to business, rose rapidly to the positions of train dispatcher, chief dispatcher and train master, respectively. When the division headquarters were removed from Fresno, where he was chief dispatcher, Mr. Steininger's superior ability was recognized in his appointment as train master and chief dispatcher of the Coast Division, which had recently been consolidated with the Santa Cruz narrow gauge line.

The dispatchers on the Coast Division are assigned as follows: Main Line—First trick, G. I. Ewers; second trick, G. J. Walters; third trick, Geo. Merritt. Narrow gauge—G. B. Fairbanks; extra dispatchers, C. S. Jeffery and G. H. Luke.

G. I. Ewers was born in Angola, Ind., in 1862 and commenced railroading for the Flint and Pere Marquette Railroad in 1880. He worked for several different roads until 1886, when he came West and entered the employ of the Southern Pacific. Mr. Ewers holds one of the most important positions on the whole system. The many trains on this section of the road, which is all single track, taxes the capacity of the road to its utmost and makes the work of the dispatcher one of constant watchfulness.

G. J. Walters is a native of Wisconsin and is forty-two years of age. He began his telegraphic career with the Chicago and Northwestern Railroad at the age of sixteen. In 1877 he was engaged, with four others, by Chief Signal Officer Gen. A. W. Greely, to make an exploration trip to the north pole. Mr. Walters, fortunately, as it afterwards proved, changed his mind and only accompanied them part of the distance, the remainder of the party, proceeding, were lost in the wilds of the Arctic regions. He served as chief dispatcher of the Montana Division of the Great Northern Railway, Great Falls, Mont., and in 1880 came to San Francisco on a leave of absence, but was captivated by the California climate and found employment in the dispatcher's office of the Coast Division, where he has since been.

Geo. Merritt was born in Pennsylvania in 1860 and went to work for the Pennsylvania Railroad in 1875. In 1880 he engaged with the Southern Pacific Railway.

G. B. Fairbanks was born in Boston, Mass., in 1850 and commenced railroading with the New York and New England Railway in 1876. In 1886 Mr. Fairbanks came West and went to work for the Southern Pacific, serving on all the divisions. He has filled the positions of chief dispatcher and train master and is a very competent railroad man. For the past three years he has been located in San Francisco.

C. S. Jeffery, who is a native of Canada and forty-two years old, began his railroad career on the

Philadelphia and Erie Division of the Pennsylvania Railroad at the age of seventeen. He worked for the Philadelphia, Wilmington and Baltimore Railway, now a part of the Pennsylvania system, and the Denver and Rio Grande. He was on the Shasta Division of the Southern Pacific for several years and was transferred to the Coast Division two years ago.

G. H. Luke, a native of Michigan, began his telegraphic career on the Michigan Central Railroad in 1880, at the age of nineteen. After several years' service with that company he found employment with the Northern Pacific. In 1887 he came West and has been with the Southern Pacific since that time.

The next issue of TELEGRAPH AGE will contain a sketch of the different branches of the Coast Division, with names of operators at the many important junction points, etc.

EVANSVILLE, IND., WESTERN UNION.

On January 1, 1872, Geo. I. Johnson picked up his manifold clip and left the old Evansville & Wabash telegraph office, at the corner of Main and Water streets, and went to the then new Western Union office, on the alley next to the old National Bank, on Main street.

The force in the office was as follows: N. M. Booth, manager; Eugene Nolan, chief operator; Geo. I. Johnson, Associated Press operator; E. J. Marshall, John H. Hedden and W. V. Duke, operators, and Ernest Huer, lineman. Of this number Nolan, Johnson and Huer are dead, Hedden is living in Los Angeles, Cal.; E. J. Marshall is now manager of the Western Union office at Bowling Green, Ky., and Col. W. V. Duke has become manager of this office, which is now located at the corner of Main and First streets.

The force on January 1 embraced the following: C. H. Wise, chief operator; W. E. Keller, Indianapolis local; J. T. MaLden, Nashville and St. Louis; W. E. Deusner, Cincinnati and way wires; Ollie Morris, The Associated Press; R. Green, night chief; G. W. Newman, night report; E. L. DeLaney, check clerk; N. B. Booth, bookkeeper; F. Myer, delivery clerk; Chas. Conn, day clerk; C. J. Raley, night clerk; Geo. Augustine, lineman, and Mr. Van Crabtree, janitor. We also have a fine district service, employing seven messengers.

ST. LOUIS, MO., WESTERN UNION.

Among the latest arrivals we note the following: Miss Nellie Mansfield, of the Wheatstone, and Miss Annie Steinbach, of the Morse; Henry Horstman, from Hot Springs, Ark., where he sought and found relief for his rheumatism, and Mr. J. J. Murphy, also from Hot Springs, where he was subbing in Walbaum's pool room for M. J. Fitzpatrick, of New York, who relieved him December 19.

Col. M. D. Crain, our genial night chief operator, recently returned to work after a three weeks' siege of the grip.

Grip was quite prevalent among our force recently. Chas. Lampard, Edward McGrath and F. A. Davis, of the operating department, and Andrew Gibney, night watchman, being among the afflicted.

Mr. Mike Tully has added the ninth heir to his list. Although he is of nine pounds avoirdupois

and arrived some weeks ago, the news has been but just revealed. Mr. Tully's many friends wish him continued success.

Miss Lulu Koch has the profound sympathy of the entire force in the death of her stepfather. A handsome floral offering was sent.

Mrs. Phillip Bouckaert, nee Koch, is the happy possessor of a son born on December 19. Congratulations.

Kris Kringle visited Alexander Frazier and left a fine nine-pound representative of the masculine gender December 25, 1900.

Among those who came home to spend the holidays were Miss Anna Bauer, from Springfield, Mo.; Frank McBride, from West Baden Springs, Ind., and Harry Horn, from Vincennes, Ind.

Mr. Geo. J. Goehringer left for Jefferson City, Mo., December 31, to help out during the session of the Missouri Legislature.

Mr. Fred H. Moake, manager of the New Orleans Board of Trade, Western Union office, visited us December 29.

ROCHESTER, N. Y., NOTES.

Mr. Harry Schauble, formerly of the Western Union, but more recently of Wortham & Co., bankers, has opened a broker's office in Batavia, N. Y. All the operators of the city and his many friends wish to congratulate him on his success and hope he will soon have a seat in the New York Stock Exchange. Mr. Louis Sitz, of "195" Broadway, spent the holidays here with his parents. Mr. P. J. Connors was at his home in Geneva, N. Y., for the holidays. Mr. Geo. Newton, of "195" Broadway, has been spending the last few weeks in this city on a vacation. Mr. Clute Noxon, formerly chief operator of the Postal, in this city, has been promoted to the editorship of the "Circulo Espanol," the only Spanish paper published between New York and Chicago. Mr. Noxon's many friends wish him success in his new undertaking. He made a speech before the Spanish Club, of this city, January 3 at their annual banquet.

CHICAGO, ILL., WESTERN UNION.

Miss Thompson, the desk lady, and the friend of all, was the recipient of a doubly beautiful Christmas present from the boys and girls of this office, consisting of a very handsome purse of sea-lion skin with gunmetal mountings. Enclosed was a check for seventy dollars. The occurrence was a complete surprise, and Miss Thompson wishes to thank all the donors through the medium of TELEGRAPH AGE, so that all may be reached.

E. F. Wilson has been acting as temporary manager at Clinton, Ia.

Messrs. O. R. Dogee, J. A. Rissell, C. H. Shively, Nels. M. Hanson and D. C. DeLany have accepted positions at San Francisco on call for five expert operators. Our good wishes accompany them.

We were honored on New Year's Day by the return of Colonel Soule, who had been ill for several days.

Geo. Porter spent the holidays at Galena with his little daughter.

Mrs. Hanson shows her appreciation of TELEGRAPH AGE by subscribing for it.

Chas. Morse, of the Metropolitan Division, has been appointed to succeed Andy Bouhan on the gold and stock circuit.

Division Chief, James Cummins, was the receiver of a beautiful chocolate set of four pieces from the grateful boys and girls of his division. Mr. Cummins was highly pleased and gave many thanks.

Evan Jones is helping out at Springfield, Ill., for a short time.

Visitors: Messrs. Feist and Parson, chief operator and assistant chief clerk, of the Illinois Central Railroad, of this city, December 22; Mr. Sherman Holbrook, of Minneapolis, Minn.; the Misses Eva Walsh, of Eau Claire, Wis., and Stevens, of Grand Haven, Mich., and Mr. David Thomas, the latter being a resident of Australia, and who is on a visit to his brother, Frederic Thomas, and sister, Mrs. Hopkins.

Division Chief Gallagher took a nap on his homeward bound train on Saturday evening, December 15, which came near resulting in fatal consequences.

The train had passed his station when he awoke, and making his way to the rear of the train, he essayed one of his old railroad train drops, but the train was moving too rapidly and he was thrown into the ditch alongside the track, where in an unconscious condition he was found several hours later by some laborers. By them he was taken to the nearest pharmacy, where after considerable work he was restored to consciousness. His many bruises were treated and at daylight Sunday morning he finally reached his home.

The recent death of Delavan S. Foote, of this city, brings to mind another of the old-time telegraphers whose service for the company is only a memory to those who have been in the office many years.

DAYTON, OHIO, NOTES.

Dayton, although not so large as some other towns, has a widespread reputation as a manufacturing town, and her products go to all quarters of the globe. Business has been exceptionally good this season.

We also have among us a few old-timers who are still manipulating the keys.

Mr. Geo. H. Gangnagel is the genial manager of the Western Union office, with E. J. Lane, chief operator, and Wm. Flynn, Geo. Schaeffer and Harry Froehle, day operators; Harry Githins and Wm. Thompson, nights; Walter DeWeese, all night man.

At the Union Station Ed. Shank is day, and Ed. Bowman night, operator for the Western Union.

Mr. E. J. Lane was born in Dayton, December 3, 1835, and obtained his first position as an operator in 1852 here in this city with the Joint Wade National House Printing Company, of Ohio, Indiana and Illinois. He worked in Sandusky and Cincinnati, and was chief operator at Columbus for nine years, and manager at Dayton for nearly twenty-five years, where he is still employed as chief operator. He is an expert sender and receiver, a first class electrician and very popular with the boys. He looks like one still in his forties.

The Postal office is managed by Mr. W. C. Weinman, a very popular official, with W. H. Hunsaker as chief operator, Frank Froehle and Maurice Flynn days, and W. H. Menges, nights.

At the Stock Yards we find J. C. Grubb in charge. Mr. Wm. H. Hunsaker was born at Hamilton, O., December 30, 1846. He began his telegraphic career as an operator in October, 1863, with the Cincinnati, Hamilton & Dayton Railroad, at Hamilton, O. He worked for the road at various places and was promoted to be a train dispatcher at Cincinnati in 1869. He has also worked for the Western Union at Cincinnati, Columbus, Richmond, Ind., and at other points, and has been with the Postal, at Dayton, since July, 1888. He is a first class operator, and copied Associated Press matter for a number of years in his early days.

At the Journal we find A. J. Coates, who hails from Bradford, Pa., for The Associated Press, nights.

At the News, Mr. Steahl, who hails from Minneapolis, Minn., represents The Associated Press, days.

At the Herald, Charles Melrose, of Cincinnati, for the Scripps, days.

At the Press there is a late arrival in the person of E. F. Loar, from Columbus, O., for the Scripps, days.

At the broker offices we find for Logan leased wire system, Hugo Reisser, a Dayton boy; Camps-leased wire, J. H. McIntosh, a Detroit, and O'Dells leased wire, Geo. Pomeroy, from Jamestown, N. Y.

KANSAS CITY, MO., WESTERN UNION.

The event of the season in Kansas City circles was the Century ball, which was participated in by quite a number of the craft.

E. R. McLaughlin left on the 24th ult. for Hot Springs, Ark., where he hopes for relief from rheumatism, with which he has been more or less afflicted for the past two years.

Messrs. Fred, Wessel and John Ryan, who left nearly a year ago, on account of ill health, and have since been working in Denver, Col., Western Union,

Deafness Cannot be Cured

by local applications, as they cannot reach the diseased portion of the ear. There is only one way to cure deafness, and that is by constitutional remedies. Deafness is caused by an inflamed condition of the mucous lining of the Eustachian Tube. When this tube is inflamed you have a rumbling sound or imperfect hearing, and when it is entirely closed deafness is the result, and unless the inflammation can be taken out and this tube restored to its normal condition, hearing will be destroyed forever; nine cases out of ten are caused by catarrh, which is nothing but an inflamed condition of the mucous surfaces.

We will give One Hundred Dollars for any case of Deafness (caused by catarrh) that cannot be cured by Hall's Catarrh Cure. Send for circulars, free.

F. J. CHENEY & CO., Toledo, O.

Sold by Druggists, 75c.

Hall's Family Pills are the best.

called upon old associates in this office during the holidays, seemingly having been much benefited by their Western sojourn.

Other recent callers were: Joseph Masker, loop chief, of Chicago Western Union; Charles Matfeldt, Chicago Postal, and Samuel McConnell, of St. Louis, Mo., Western Union.

Returned from vacations: John H. Vogan, from a visit to Shreveport, La., and T. M. A. Haston, from Abilene, Kan., where he spent the holidays at home.

Mr. and Mrs. Frank D. Howe are the proud parents of a daughter, born December 30, just in time for the Century "bawl."

Wilson O. Appleby left us December 21, to work in the telegraph department of the Santa Fe general offices at Topeka, Kan.

The following changes have occurred in branch offices: Walter Martin, appointed manager at Coates' Hotel, vice Miss Eleanor Pearson, resigned; James B. Hughes, transferred to Cudahy's, being relieved at 12th and Main streets by Miss Myrtle Kile, from Emery Bird Thayer & Co.'s; Miss Maggie Crooks, of the Wheatstone department, has been appointed to fill the latter position.

CINCINNATI, O., POSTAL.

John N. Garner has been very sick for six weeks with muscular rheumatism.

F. D. Wheeler has been appointed manager of the Third and Walnut street branch, vice A. H. Brockman, resigned.

A. T. Duckett has been assigned to Mill Creek branch, vice Miss Lamar, transferred to the manager's office.

Manager C. E. Sawtelle and family spent the holidays in Chicago.

The Postal has opened an office in Gerdes' Hotel on West Fifth street.

MONTREAL, QUE., CANADIAN PACIFIC.

Harry Schraeder has been assigned to the St. James street ticket office, vice Romeo Stephens, transferred to the main office.

Mr. J. A. Collie is reported to be convalescing from his recent illness.

Business continues good.

The Ottawa Parliament will meet in the early part of February. It is not expected the session will be a long one.

Among the recent visitors during the Christmas holidays were: W. J. Morrisette, manager at Halifax, N. S.; H. J. McCann, of the Dominion Steel and Iron Works, Sydney, N. S., and W. Fraser, of the Postal Telegraph-Cable Co., New York. The above named gentlemen formerly worked in the old office at No. 4 Hospital street. They all enjoyed themselves visiting their numerous friends in the city.

NEW YORK, POSTAL.

Mr. Frederick Zeiss, assistant wire chief on East and North, has returned after an absence of a few days, caused by the death of his mother.

Mr. J. B. Roloson, late clerk to Manager Shirlev, upon his return from a holiday vacation spent with relatives at Port Jervis, N. Y., was assigned to duty as operator in the East and Northern division. He is the son of John W. Roloson, former night manager

of the Postal, well and favorably known to the fraternity, and who met his death through a bicycle accident several years ago. Mr. A. A. Hageman has been assigned to Mr. Roloson's place at the manager's desk.

Messrs. F. M. Wilcox and J. P. Lyons, of the city department, returned last week from their holiday vacation.

Mr. Thomas H. Tierney, of newspaper locals, has returned from a vacation down in Maine.

Mr. F. J. O'Meara, of the Cable wire, who has been absent on a vacation, is back again at his old post.

A. B. Banker lately returned from Lake Placid, in the Adirondacks, where he spent the summer, and has resumed work.

Joseph McNulty, the Eastern wire chief, and W. E. Todd, the quad chief, were both detained at home for a week recently, and at the same time, owing to illness.

W. W. Shannon is relieving the Eastern traffic chief and broker wire chief during the day.

Mr. J. D. Mann, ably assisted by T. J. Casey, is handling the clerical force in the gallery admirably. K. Cole, of their staff, spent the holidays in Boston.

Mr. Alfred Tully, who has been absent for a long time on account of illness, is again at his post.

Mr. M. McDermitt, the chief night clerk, has earned a title, being a practical man of many years' service.

Mr. Joseph Ahearn, of the "Journal," is very proud of the new switchboard recently put in in that office.

Mr. E. X. Donaldson, of the City lines, has resigned, to accept a position in the Race Department of the Western Union at 195 Broadway.

Mr. J. P. Love resigned some days ago, to accept a position in Washington, D. C.

Mr. T. G. Williams has resigned his place as night traffic chief on the East, and departed for Pittsburg, to enter the Postal service at that point.

Mr. Thomas Kehoe, of the Postal "Evening World" wires, was at White Plains, N. Y., for several days recently, looking after the golf specials for that paper at that point, which were handled by him in fine shape.

The force in the Eastern and Northern divisions have been suffering from colds, owing to the draughts from the two entrances to the operating department. The management has had a substantial curtain hung on handsome brass tubing, so placed as to effectually shut out all draughts. This action is much appreciated by the operators in those divisions. A similar curtain has been in position for some time in the service department, and gives great satisfaction.

Several of the ladies have been absent from two to four days on account of vaccination, which incapacitated them from duty.

Mr. Fred Flint is still on the sick list. His illness has been of long duration.

William Collins, of the City department, has returned, after a few days' illness.

BALTIMORE, MD., WESTERN UNION.

Among our Christmas eve visitors (native Baltimoreans, now located elsewhere) renewing old ac-

acquaintances, visiting relatives and bringing presents to their sweethearts, were the following: Marion Creamer, manager Western Union, Knoxville, Tenn.; Millard Griffin and Otto Scherf, New York broker offices; Harry Myers, Commercial News Department, New York, and George Walters, Western Union office, Washington.

The Check Boys sent the following greeting to their fellows throughout the country: "Wishing you Queen Victoria's health, Rockefeller's wealth, Bryan's pluck and McKinley's luck."

Mr. J. W. Shock has the sympathy of all in the loss by death of his four-year-old son.

Mr. C. B. Martin acted as manager at Waynesboro, Pa., during the Christmas vacation of Manager Anderson.

Mr. Harry F. Whetzle and Mr. J. R. Topp are on the sick list.

NEW YORK, WESTERN UNION.

There were far more than customary New Year and New Century greetings sent the morning of January 1. The force was hardly sufficient to handle the messages, yet some of the best records for a year were made. In the afternoon business fell off with a slump, only to revive with greater force in the evening, and a large force was required to take care of it. Now that the holidays are past, everyone will settle down and look forward to the coming of the Fourth of July, which will soon come—the days, weeks, months and years seeming to fly.

Mr. John J. Barry, a well-known, old-time operator, and who was formerly chief clerk of the superintendent's office, was appointed School Commissioner of the Borough of the Bronx by Mayor Van Wyck, of New York, January 1.

Mr. G. A. Kerr, an old time telegrapher, manager of the circular, addressing and distributing department during the past nineteen years, resigned recently to enter the same business for himself.

Mr. James J. O'Brien, formerly of this office, was recently appointed day agent at the Fifty-ninth street station on the Manhattan Elevated Railroad, New York.

Fifteen new ventilators have been placed in the operating room windows.

Mr. John Reichart, night manager of 666 Columbus avenue office, discovered a fire in a building on the opposite side of the street at 2 A. M., January 2. By his prompt turning in an alarm of fire and awaking the occupants of the large flat house in which it originated, he probably saved many lives and the destruction of the building itself.

Mr. William Wall, of the night force, was abruptly awakened early on the morning of January 5 by his wife, who was vigorously fighting fire in their servant's room. Quickly going to her assistance, the flames were soon extinguished. Mr. and Mrs. Wall had their hands slightly burned, and the damage otherwise sustained was trifling.

Mr. John Brant, secretary of the Old Time Telegraphers' Association, who was absent several days on account of sickness, returned to the office January 1.

Mr. F. O. Nourse has been absent several days, owing to sickness. Mr. W. E. Rath attended to the

duties of general traffic chief in Mr. Nourse's absence, while Mr. Arthur M. Lewis acted as Eastern division traffic chief.

Mr. A. C. Wark, formerly an operator at "195," is seriously ill with pneumonia at his home at Highwood, N. J.

Messrs. John J. Donnelly, A. W. Rittenhouse, Charles Brooks and several others suffered lately from severe attacks of the gripp.

Mr. J. F. Paddock has been assigned to the Commercial Advertiser office, vice Mr. Maurice Wescoe, who resigned to accept a position with a broker.

Miss Anna L. Sweeney died January 6, after a long illness, at her home in this city. Miss Sweeney was a fine operator, and highly esteemed by all her friends and telegraphic acquaintances.

Mr. Thomas S. Tintle, porter on the all night force, died at his residence in Brooklyn, January 8.

THE NEW YORK COTTON EXCHANGE OFFICE.—

One of the many branches of Supt. Redding's district has just passed through one of the busiest seasons of its existence. Owing to the activity of the cotton market, Manager Sullivan and his able assistants have been taxed to their utmost to handle the immense volume of business with the promptness that is an absolute necessity in this class of work. The personnel of the office is as follows: Manager, P. F. Sullivan, assisted by Joseph Cahill, E. F. Frazier and Miss Bessie Lee, operators; William Richter and Joe O'Donnell, receivers. Miss George is the bookkeeper. Among the extra men (who constitute the greater part of the force) are Messrs T. S. Van Kirk, F. B. Williams, G. F. Grimes, Anton Lang, K. Pittman, G. F. Detweiler, G. F. Mooney, J. H. McHugh and others. We regret to announce the illness of our bookkeeper, Miss George, as well as Receiver O'Donnell.

Typewriters expressed or sent to our shop, repaired or rebuilt at lowest prices for operators. Cylinders, ribbons, at reduced prices; machines bought, sold and rented. Wall & Butler, 57 Dey street, New York. (Adv.)

Any fifty-cent piece of music mailed eighteen cents. Rusticana, Anchored, Calvary, Palms, Flower Song, ten cents each. Anything at less than half publisher's price. I will sell you a good piano for one dollar per week, from \$35 up. B. L. Brannan, 195 Broadway, New York. (Adv.)

NEWARK, N. J., POSTAL.

The personnel of this office is made up as follows: John F. Coogan, manager; Misses R. Feldman and A. Lynch, and Mr. William Quass, operators; Mr. M. J. Coogan, bookkeeper; Mr. John Bush, delivery clerk; Mr. James Delaney, night operator, and Mr. John Tully, lineman. Mr. Arthur Nipperts is in charge of the office at the Continental Hotel.

PHILADELPHIA, PA., POSTAL.

The holiday week was full of pleasant memories for many of us. Visitors to the office were very numerous, none of whom, doubtless, were more welcome than Mr. and Mrs. Walter Houghtaling, who came over from New York to visit relatives and call on their host of friends here.

Among those who took advantage of the holidays to visit their homes were the Misses Hannah Bros-

nahan, who was relieved by her brother—a young law student; Lou Koch, and the Messrs. William Wisegarver and J. M. Connell.

Traffic Chief Geo. W. Dunn and Joseph Hockery spent a short time in New York.

Mr. E. A. Goshert, of Washington, D. C., renewed old acquaintances while here on a visit.

The beginning of the new year saw the complete installation of the third district—a district telegraph office in the allotted space at the Sansome street end of the building. It was a great task, but accomplished without a hitch. The two Morse operators, Messrs. Elmer Locke, who had been connected with that office for the past fourteen years, and William Bowers, have been assigned places on the main office staff.

Mr. R. D. Swinehart, temporarily transferred to Norristown, Pa., has returned.

Messrs. Harry E. Cilley, J. J. Hughes and J. M. Quigley, new arrivals; and Ernest Truitt and F. G. Spiker, departures.

Grip, colds and rheumatism have been depleting our force somewhat. Among the victims were: Samuel Higo, Horace Holtzinger, Frank Holloway, Robert Mecredy, of the Commercial Exchange; W. T. McCorkle and William Madden. Some of them, at this writing, are still absent.

Mr. Roscoe Smith, of the Baltimore local, has been temporarily assigned the 1st N. Y. bonus wire during Mr. Madden's absence.

Telegraphy by the sun's rays without the use of a heliograph was practically and amusingly demonstrated to Quad Chief C. C. Dreher and Traffic Chief Miles Dunn on a recent morning, when their attention was directed to an agitated spot of sunlight, which at once proceeded to spell out their full names in the Morse alphabet. Investigation disclosed the fact that the sun's rays, falling on the hand of Mr. Chas. McIntyre, were diverted and actuated whenever he made a movement in transmitting a message. The same characters were made by the diverted ray against an object in another part of the room.

Mr. Jay A. Thomas, of the 1st N. Y., is in happy suspense, awaiting the arrival of the day in the very near future when he is to be made a benedict.

Manager Daniel Carlin, of the Harrison Building office, refused a flattering offer to enter the employ of a banking house, preferring to remain with the company.

The coming annual election and banquet of the Electrical Aid Society is eagerly anticipated.

It befell the unhappy lot of a broker operator to discover a legal loop-hole, which was the cause of his being fined \$25 and compelled to serve on the grand jury. The operator believed the Telegraph Operators' Exemption Law was valid in his

case, but the judge declared that telegraph operators in the employ of private firms could not be excused under this act, and, accordingly, imposed the fine.

Manager Bobb, of the Baltimore Corn Exchange office, called in to see his old friend Robt. Mecredy, at the Commercial Exchange.

PHILADELPHIA, PA., WESTERN UNION.

Harry Ettenger, Western Union manager for the past eight years at Cape May, N. J., resigned Jan. 1, to go with a telephone company. R. A. Black, of this office, is manager, pro tem, at Cape May.

Miss M. A. Mullin and A. J. Murren are absent on account of sickness.

Miss Mcgonigle has resigned, to accept a position with a broker.

Miss F. E. Milligan, after a month's sojourn in Boston, has again returned to duty.

Miss Paxson, of the Hotel Walton office, spent several weeks' vacation in California.

Stan. V. Miller, manager of the Hotel Brighton Western Union office, Atlantic City, N. J., has resigned. L. S. Miller, of this office, succeeds his namesake.

A full report of the Aid Society's meeting, which was held January 14, will appear in the next issue of TELEGRAPH AGE. Look out for it, as the meeting was a spicy one.

B. A. Riley, a well-known operator, is doing a rushing business as agent for a well-known typewriter firm. His advertisement will soon appear in TELEGRAPH AGE.

Robt. Barker, formerly operator at Radnor, Pa., is now in Havana.

H. M. Schultz took a week's vacation, visiting friends at Pottsville.

G. C. Bushnell, a Philadelphia and Reading agent at Mt. Airy, Philadelphia, was a recent visitor. SAN FRANCISCO, CAL., WESTERN UNION.

A new office has been established at the General Hospital, Presidio, with Cecil D. Ross, of the Hospital Corps, from Holly Springs, Miss., as manager.

Arrival: Mr. Summerl, from The Associated Press, Minneapolis.

Departures: Mr. Harrington, who goes to Fresno, as manager, vice Mr. Vincent, appointed cashier at San Francisco; Mr. Wesley Davis, to Bolton DeRuyter leased wire service; Mr. Swanson succeeds Mr. Harkness at the Merchants' Exchange, and Mr. E. B. Peppin assigned to the Tanforan race track, vice J. V. O'Brien.

The late storms have made the extras and regulars jubilant, the shortage of wires making it necessary to work the Wheatstone nights, and all take a hand at copying tape.

Readers of the TELEGRAPH AGE are referred to the advertisement of the Montauk Cable Company on page two of the front cover. (Adv.)

The Modern Service of Commercial and Railway Telegraphy (8th Edition, revised and enlarged), by J. P. Abernethy. The theory and practice, including railway station and express service. Arranged in questions and answers. 426 pages, 40 illustrations. Price \$2.00, expressage prepaid. Address John B. Taltavall, The Telegraph Age, 263 Broadway New York.

IMPORTANT TO YOU

J. S. TOWNSEND—The Telegraphers' Jeweler, 1554 Wabash Ave., Chicago, offers any article in his elegant stock at net wholesale prices. A rare opportunity. Any watches or jewelry advertised can be bought at a lower price from this well known firm, J. S. TOWNSEND, 1554 Wabash Ave., Chicago. Our 400-page catalogue sent on application. Agents wanted. Established 1877.

TYPEWRITERS FOR SALE, TO RENT and REPAIRED, Remington, Smith, Densmore and all makes sold or rented on easy monthly terms to telegraphers. Send for samples, catalogues and full information to E. M. Bennett, Manager, THE TYPEWRITER EXCHANGE, 38 Bromfield Street, Boston, Mass.

SEAL

OF NORTH CAROLINA PLUG CUT

is a mild, cool, mellow and satisfying tobacco of the highest quality and is the most popular and largest selling brand of "plug cut" smoking tobacco in the world! The reason for this is that the leaf that "Seal" is made of is cured in its own native climate—in the sunshine and balmy atmosphere of the southern states, where pipe tobacco originated. A full size trial pouch will be sent by return mail on receipt of ten cents in postage stamps by
The American Tobacco Co.,
 111 Fifth Avenue, New York, N. Y.

THE EDISON PHONOPLEX SYSTEM OF TELEGRAPHY

INSURES CONSTANT COMMUNICATION.

It WORKS through all kinds of trouble and weather.
Are you using it? If not, write to its patrons and ascertain their opinion of it.

SOME USERS OF THE PHONOPLEX SYSTEM:

Western Union Telegraph Co. Illinois Central R. R. Co. Boston & Maine Railroad. New York, New Haven & Hartford R. R. Co. Lehigh Valley R. R. Co. Central Railroad of New Jersey. Baltimore & Ohio R. R. Co. Baltimore & Ohio & Southwestern R. R. Co. Pennsylvania R. R. Co. Union Pacific R. R. Co.	Kansas City, Fort Scott & Memphis R. R. Co. Kansas City, Council Bluffs & Omaha R. R. Co. Colorado Midland R. R. Co. Central of Georgia R. R. Co. Chicago & Grand Trunk Railway. Standard Oil Co. Tide Water Pipe Line. Atchison, Topeka & Santa Fe R. R. Co. Southern California Railway Division. Atlantic & Pacific Division.
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Catalogue and Further Information upon Application. **THOMAS A. EDISON, Grange, N. J.**

THE IDEAL SIGHT RESTORER



WE RESTORE SIGHT!

CLASSES RENDER DEFECTIVE VISION CHRONIC.

Write for our **ILLUSTRATED TREATISE, Mailed Free.**

THE IDEAL COMPANY,
 230 BROADWAY,
 NEW YORK.






I have used Piso's Cure for Consumption for colds, and found it a splendid medicine, as it gives instant and (when taken according to directions) lasting relief, and I would recommend it to all who are so troubled.—**R. J. COYNE, Directory Department of Chicago Post Office, Chicago, Illinois, April 7th, 1899.**

Maver's American Telegraphy. A thorough Encyclopedia of the Telegraph. Over 600 pages, 450 illustrations. Price, \$3.50, express charges prepaid. Address **J. B. Taltavall, 253 Broadway, New York.**

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144 DINNER SET PIECE AND 48 PIECES SILVERWARE FREE



A rare chance. No deception, we speak nothing but the truth. You can get a full size decorated breakfast, dinner or tea set (144 pieces) & 12 silver plated knives, 12 forks, 12 tea spoons & 12 table spoons for selling our Remedies. We have a reputation for square & honest dealing & to prove it, every honest person who sells 6 boxes of our Vegetable Pills at 25 cts. a box, a positive cure for constipation, indigestion & torpid liver, will receive our generous offer of a 144 piece decorated set & 48 pieces of silver plated table ware with a beautiful Butter knife, Sugar Spoon & Salt & Pepper set which we give absolutely free for selling the 6 boxes of Pills. Don't send a cent, order to-day & we send Pills by mail, when sold send us the \$1.50 & we guarantee if you comply with our offer we shall send you with the Butter knife, Sugar Spoon & Salt & Pepper set, the 12 Knives, 12 Forks, 12 Table Spoons, 12 Tea Spoons & 144 piece decorated set will be given absolutely free. We are an old reliable concern, & guarantee the dishes & silverware full size for family use. Address **L. OETNER, Supt., Dept. S, 30 W. 13TH ST., N. Y. CITY.**

TELEPHONES


**FOR LONG LINES
SHORT LINES
PRIVATE LINES
EXCHANGE LINES
TOLL LINES**

and All Lines of Business.

YOU KNOW THE
KIND:

The STANDARD.

A CRITERION OF
EXCELLENCE.



Standard Telephone and Electric Company

MADISON, WIS.

STYLUS! STYLUS! STYLUS!

Use the Rogers Stylus, if you want the best; for thirty years we have been making them, and they have a world-wide reputation.

AGATE STYLUS—40 Varieties.

With red, white, blue, green, moss, crystal, blood-stone, tricolorite and other fine points; mounted on ebony, mahogany, pearl, bone, gutta-percha, rubber, cedar and pen handles; with nickel-plated, gold-plated and engraved ferrules, some with sliding, others with reversible, points. Price, 20 cents to \$5.00 each. On exhibition, 10,000 agate points, agate pens, rulers, paper weights, paper cutters, all-agate stylus, agate point watch charms, etc. Many of them making handsome presents, souvenirs, etc. Send for price list, with full-size cuts.

**STEEL, BONE AND GLASS STYLUS
20 Varieties**

A large assortment, in all kinds of plain and fancy handles. Price, 10 cents to \$1.00. Also music and writing stylus for the Mimeograph and other duplicating devices.

RELIABLE GOODS. ESTABLISHED 1869.

**Rogers Manifold and Carbon Paper Co.,
75 Maiden Lane, New York.**

A REMARKABLE INVENTION

BY AN OHIOAN,

A prominent business man of Cincinnati has invented a new Vapor Bath Cabinet that has proven a blessing to every man, woman and child who has used it; and as many of our readers may not know of its real comfort and blessings, we illustrate it in this issue.

This Cabinet is an air-tight, rubber-walled room, in which one comfortably rests on a chair, and, with only the head outside, en-



Open—Ready For Use.

joys all the cleansing, curative, beautifying and invigorating effects of the famous Turkish Bath, Hot Vapor or Medicated Bath at home, for 3 cents each, with no possibility of taking cold or in any way weakening the system.

These baths have truly marvelous powers, far superior to soap and water; celebrated for producing glowing faces, fair skin, bright eyes, elastic figures and perfect health to all men and women who make them a weekly habit, and this invention brings them within the reach of the poorest person in the country.

Clouds of hot vapor or medicated vapor surround the entire body, opening the millions of sweat-pores, causing profuse perspiration, drawing out of the system all the impure salts, acids and poisonous matter of the blood, which, if retained, overwork the heart, kidneys, lungs and skin, causing colds, fevers, disease, debility and sluggishness.

Astonishing is the improvement in health, feeling and complexion by the use of this Cabinet, and it seems to us that the long-sought-for method of securing a clear skin, a good complexion, of retaining good health, curing and preventing disease without drugs, has certainly been found.

The makers inform the writer that more than 600,000 of these Cabinets have been sold, and show letters from thousands of users who speak of this Cabinet as giving perfect satisfaction.

A. B. Stockham, M.D., of Chicago, editor of "Tokology," recommends it highly, as also does Congressman John J. Lentz, Hon. Chauncey M. Depew, Rev. C. M. Keith, editor "Holiness Advocate"; Mrs. Senator Douglas, Rev. James Thoma, Ph.D., pastor First Baptist Church, Centerville, Mich.; Rev. J. C. Richardson, Roxbury, Mass.; Rev. H. C. Roernae, Everett, Kan.; John T. Brown, editor "Christian Guide," and thousands of others.

Ira L. Gleason, prominent citizen of Hutchinson, cured himself of rheumatism and his friends of colds, pneumonia, fevers, grippe, blood, skin and kidney diseases, and made \$2,500 selling this Cabinet in a little more than 12 months. Mrs. Anna Woodrum, of Thurman, Iowa, afflicted 10 years, was promptly cured of nervous prostration,

stomach and female troubles, after medicines and doctors failed. She recommends it to every woman as a God-sent blessing. O. C. Smith, of Mt. Healthy, Ohio, was cured of a bad case of catarrh and asthma, and says: "It was worth \$1,000 to me. Have sold several hundred cabinets; every one delighted." O. P. Freeman, an aged railroad man, afflicted 17 years, unable at times to walk, was cured of kidney troubles, piles and rheumatism. Thousands of others write praising this Cabinet, so there is absolutely no doubt of it being a device that every reader of our paper should have in their homes.

This invention is known as the new 1903 style, Quaker Folding Vapor Bath Cabinet, and after investigation we can say that it is well, durably and handsomely made of best material throughout, has all the latest improvements, will last a lifetime, and is so simple to operate that even a child could do it safely. It folds flat in one inch space when not in use; can be easily carried; weighs but 10 pounds.

IT IS IMPORTANT TO KNOW

that the makers guarantee results and assert positively (as do thousands of users) that this Cabinet will clear the skin, purify and enrich the blood, cure nervousness, weakness, that "tired feeling," and the worst forms of rheumatism. (They offer \$50.00 reward for a case not relieved.) Cure's Women's Troubles, Neuralgia, Malaria, Sleeplessness, Gout, Sciatica, Headaches, Kidney and Nervous Piles, Dropsy, Liver, Troubles and Blood Diseases.

It cures the worst Cold in one night and breaks up all symptoms of La Grippe, Fevers, Pneumonia, Bronchitis, Tonsillitis, and is really a household necessity, a blessing to every family. To please the ladies a Head and Face Steaming Attachment is furnished if desired, which clears the skin, beautifies the complexion, removes pimples, blackheads, eruptions, and is a sure cure for skin diseases, Catarrh and Asthma.

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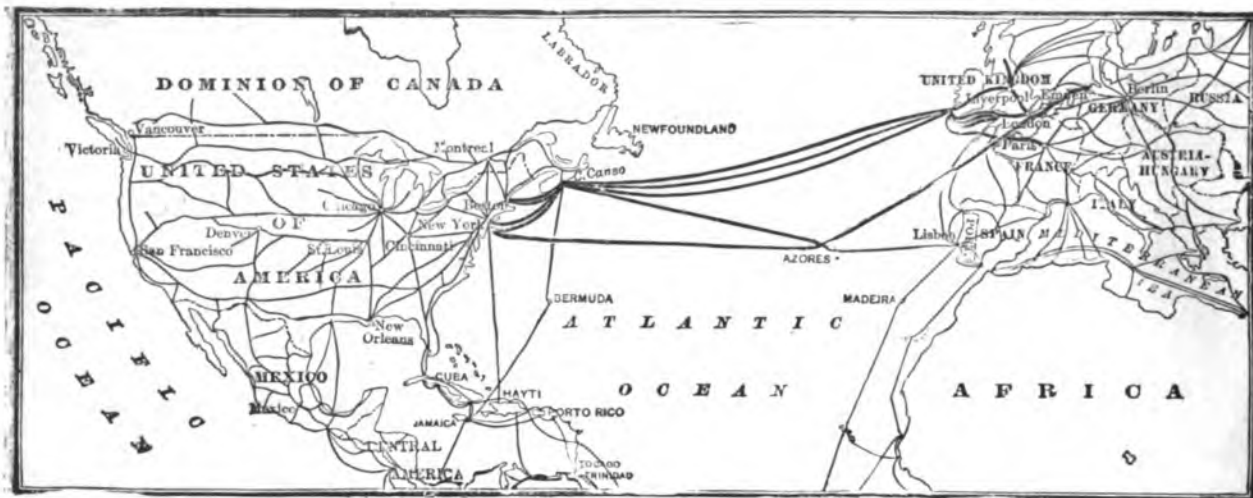


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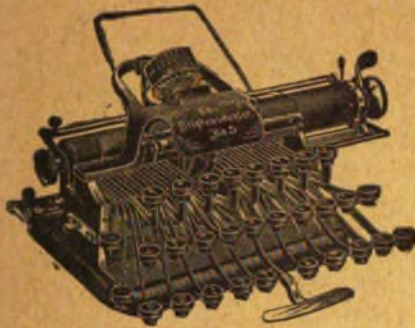
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