

TELEGRAPH AGE

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

ESTABLISHED
1883

Office of Publication: 253 BROADWAY, NEW YORK

Single Copies 10 Cents { \$1.50 per Year
2.00 to Foreign Countries

VOL. XXIV., No. 7.

NEW YORK, APRIL 1, 1906.

Whole No. 549

ELECTRICAL SUPPLIES AND SPECIALTIES
FOR
TELEGRAPH AND SIGNAL WORK
General Sales Agents for OKONITE WIRE.



Central Electric Company,

264-266-268-270
FIFTH AVENUE,
CHICAGO.

1889

PARIS EXPOSITION MEDAL FOR
RUBBER INSULATION.



1893

WORLD'S FAIR MEDAL FOR
RUBBER INSULATION

THE STANDARD FOR RUBBER INSULATION.

SOLE
MANUFACTURERS OF

Okonite Wires, Okonite Tape, Manson Tape, Candee Weatherproof Wires

THE OKONITE CO., LTD., 253 BROADWAY, NEW YORK.

WILLARD L. CANDEE,
M. DURANT CHEEVER, } Managers

WRITE FOR PRICES.

GEO. T. MANSON, Gen'l Supt.
W. H. HODGINS, Secy.

The Remington Typewriter

is *the* telegrapher's machine—so recognized by telegraph operators everywhere. The majority of all machine operators the country over use the Remington.



The reason is as plain as the fact itself. The Remington is the swiftest, the Remington is the most durable and reliable of all writing machines—and these are the qualities in a typewriter which the telegraph operator demands.

Remington Typewriter Company

325-327 Broadway, New York

BRANCHES EVERYWHERE

IN CORRESPONDING WITH ADVERTISERS PLEASE MENTION THIS PUBLICATION.

BOOKS ON THE TELEGRAPH.

ABERNETHY, J. P.—The Modern Service of Commercial and Railway Telegraphy, in Theory and Practice, including the Railway Station and Express Service; arranged in Questions and Answers; \$2.00.

CREHORE, ALBERT CUSHING, PH. D.—Synchronous and Other Multiple Telegraphs. Some methods of obtaining independent telegraph circuits on a single wire, both with and without synchronism. 124 pages; 42 illustrations; working diagrams; \$2.00.

CROCKER, F. B. AND WHEELER, S. S.—The Practical Management of Dynamos and Motors. Has a special chapter by H. A. Foster. Contents: Descriptions and Directions; Examination, Measurement and Testing; Localization and Remedy of Trouble in Dynamos and Motors; Arc Dynamos and Motors requiring special Directions. Illustrated; \$1.00.

HASKINS, C. H.—The Galvanometer and its Uses. \$1.50.

HOBBS, W. R. P., AND WORMELL, R.—The Arithmetic of Electric Measurements. \$0.50.

HOUSTON, E. J.—A Dictionary of Electrical Words, Terms and Phrases; 980 pages; 582 illustrations; \$7.00.

HOUSTON, E. J.—A Pocket Dictionary of Electrical Words; leather; \$3.00.

JONES, WILLIS H.—Pocket Edition of Diagrams and Complete Information for Telegraph Engineers and Students. This standard work has been carefully revised and 74 pages and 30 diagrams added, including full descriptions of the newest apparatus lately adopted by the Western Union and Postal Telegraph companies. It presents the finest study of the complex subject of the telegraph ever published; it explains clearly the equipment of a modern telegraph office, and is a text book that no student, operator, engineer or official, no matter what his grade, can afford to be without; 334 pages, 52 chapters, 160 illustrations; \$1.50.

LOCKWOOD, T. D.—Electrical Measurement and the Galvanometer and its Uses; 144 pages, fully illustrated with diagrams of connections, engravings of apparatus, etc. \$1.50.

LOCKWOOD, T. D.—Electricity, Magnetism and Electric Telegraphy; A Practical Guide and Handbook of General Information for Electrical Students, Operators and Inspectors; 376 pages; 152 illustrations; \$2.50.

LYNDON, LAMAR.—Storage Battery Engineering; 360 pages; 178 illustrations and diagrams; 4 large folding plates; \$3.00.

MARSHALL, PERCIVAL.—A. I. Mech. E. Small Accumulators; How Made and Used; an Elementary Hand-Book for the Use of Amateurs and Students; \$0.50.

MAVER, WM., JR.—American Telegraphy and Encyclopedia of the Telegraph. This fine work, revised and enlarged, treats of the systems, apparatus and operation of telegraphy; 656 pages; 490 illustrations; \$5.00.

MAVER, WM., JR., AND DAVIS, M. M.—The Quadruplex. This standard book treats its subject in a most thorough manner. Its chapters are: Development of the Quadruplex; Introduction and Explanatory; The Transmitter, Rheostat and the Condenser; Stearns's Duplex; Instruments of the Polar Duplex; The Polar Duplex; The Quadruplex; The Dynamo Electric Machine in Relation to the Quadruplex; The Practical Working of the Quadruplex; Telegraph Repeaters; The Wheatstone Automatic Telegraph; 128 pages; illustrated; \$1.50.

MEADOWCROFT, WM. H.—A B C of Electricity. This book begins at the very root of electrical science, and contains a vast amount of useful information; \$0.50.

MEYER, FRED L.—Twentieth Century Manual of Railway and Commercial Telegraphy. This work embraces all kinds of commercial messages, train orders, phrases, etc.; 249 pages; illustrated; \$1.00.

MONELL, DR. S. H.—The Cure of Writers' Cramp, and the Arm Troubles of Telegraphers. This valuable treatise should be in the possession of every telegrapher suffering from this common annoyance; \$0.50.

OFFICIAL DIAGRAMS OF THE POSTAL TELEGRAPH-CABLE COMPANY'S APPARATUS AND RULES GOVERNING THE CONSTRUCTION AND REPAIR OF LINES; 134 pages; 105 full-page illustrations; \$0.50.

PHILLIPS, WALTER P.—Phillips Code. A popular, generally used and thoroughly tested method of shorthand arranged for telegraphic purposes, and contemplating the rapid transmission of press reports; also for general newspaper and court reporting; flexible leather cover, pocket size; \$1.00.

PRIME, S. IRENAENS.—Life of S. F. B. Morse. The only work authorized by the family and executors of the great inventor, compiled from original data. This is the finest, most accurate and complete life of Prof. Morse, and includes the history of the invention of the telegraph and the many important business connections with those who were interested with Prof. Morse in the development of the telegraph, that has ever emanated in any shape or at any time from the press; sheepskin; 775 pages, illustrated. The regular price of \$6 has been reduced to \$3.

POPE, FRANKLIN LEONARD.—Modern Practice of the Electric Telegraph; a Technical Hand Book for Electricians, Managers and Operators; 234 pages; 185 illustrations; \$1.50.

PREECE, W. H., AND SIVEWRIGHT, J.—Telegraphy. A description of every telegraph system and apparatus used in the English telegraph department; \$2.

PRESCOTT, G. B.—Electricity and the Electric Telegraph; 8th edition; 2 volumes; \$7.

REID, JAMES D.—The Telegraph in America. A complete detailed history of the telegraph, including the organization of the various telegraph and cable companies; 894 pages; illustrated; full morocco binding. Reduced from \$7.00 to \$5.00.

SCHNEIDER, N. H.—Electrical Instruments and Testing; 210 pages; 100 illustrations. Cloth, \$1; full limp leather, \$2.

SCHNEIDER, N. H.—Model Library, comprising 4 books, viz.: Study of Electricity for Beginners; Dry Batteries; Electrical Circuits and Diagrams; Electrical Bells, Alarms, etc.; bound in 1 volume; cloth, \$1.

SMITH, E. W.—Electricians' Manual of Diagrams; 93 pages; \$0.50.

TALTAVAL, JOHN B.—Telegraphers of To-day. Biographical and historical sketches of more than 900 leading telegraphers, living and dead; 354 double-column pages, 7½ x 11 inches; gilt edges; imitation morocco binding; only work of the kind; of much practical value to those who would keep in touch with the personnel of the profession; reduced from \$5 to \$1, express charges collect.

THOM, CHARLES, AND JONES, WILLIS H.—Telegraphic Connections; Embracing Methods in Quadruplex Telegraphy and other Apparatus; 20 plates with circuits distinguished by three different colors; \$1.50.

WEBER, W. L.—Handy Electrical Dictionary; 224 pages; 32 illustrations; cloth, \$0.25; leather \$0.50.

WILKINSON, H. D.—Submarine Cable Laying and Repairing; \$5.

YOUNG, J. ELTON.—Electrical Testing for Telegraph Engineers; \$4.

TELEGRAPH SKETCH BOOKS.

LIGHTNING FLASHES AND ELECTRICAL DASHES.—A book made up of bright, ably written stories and sketches, telegraphic and electrical, that should find a place in the home of every telegrapher; 160 large double-column pages; profusely illustrated; reduced from \$1.50 to \$1.

PHILLIPS, WALTER P.—Sketches, Old and New, by the author of Phillips Code, containing a number of telegraph stories, told with all the charm of that delightful story writer; 200 pages; illustrated; \$1.

BOOKS ON WIRELESS TELEGRAPHY.

BOTTONE, S. R.—Wireless Telegraphy and Hertzian Waves; diagrams and illustrations; \$1.

COLLINS, A. FREDERICK.—A Short History of Wireless Telegraphy, its Theory, Experiments and Results Obtained; 300 pages; 332 illustrations; \$3.

FAHIE, J. J.—A History of Wireless Telegraphy; third edition, revised; illustrated; \$2.

KERR, RICHARD.—Wireless Telegraphy; popularly expressed; 120 pages; \$0.75.

LODGE, PROF. OLIVER J.—Signaling Across Space Without Wires. A description of the work of Hertz and his successors. Contains numerous diagrams and half-tone illustrations; \$2.

MAVER, WM., JR.—Maver's Wireless Telegraphy; Theory and Practice; 216 pages; 123 illustrations; \$2.

MAZZOTTO, DOMENICO, PROF.—Translated from the original Italian by S. R. Bottone; 416 pages; 252 illustrations; \$2.50.

SEWELL, CHARLES H.—Wireless Telegraphy, its Origins, Development, Inventions and Apparatus; 229 pages; illustrated; \$2.

TUNZELMANN, G. W.—Wireless Telegraphy. A popular exposition; 104 pages; illustrated; \$0.75.

VREELAND, F. K.—Maxwell's Theory and Wireless Telegraphy; 250 pages; illustrated; \$2.

BOOKS ON THE TELEPHONE.

ABBOTT, ARTHUR V.—Telephony. Six volumes; \$1.50 per volume; the set, \$6.

DOBBS, A. E.—Practical Features of Telephone Work; 134 pages; 61 illustrations; \$0.75.

DOLBEAR, A. E.—The Telephone. An account of the phenomena of electricity, magnetism and sound as involved in its action, with directions for making a speaking telephone; \$0.50.

HOMANS, JAMES E., A. M.—A B C of the Telephone; 335 pages; profusely illustrated; \$1.

MILLER, KEMPSTER B.—American Telephone Practice; fourth edition; entirely rewritten and greatly extended. This comprehensive study of the subject explains in detail every piece of telephone apparatus; 904 pages; 304 illustrations; \$4.

PREECE, W. H., AND STUBBS, A. T.—A Manual of Telephony; illustrated; \$4.50.

PRESCOTT, G. B.—The Electric Telephone; 795 pages; \$6.

WEBB, HERBERT LAWS.—Telephone Hand-Book. A practical treatment of telephone working and management; 138 illustrations; \$1.

CABLE CODES.

ADAMS' CODEX, \$0.50.

A B C CODE, 4th Edition; \$5.

A B C CODE, 5th Edition. This book is entirely different from the work known as the "A B C Code, 4th Edition," and the two should not be confounded; \$7.

A I UNIVERSAL COMMERCIAL ELECTRIC TELEGRAPHIC CODE; \$7.50.

AMERICAN BANKERS' AND BROKERS' TELEGRAPHIC CIPHER CODE; \$2.

ANGLO-AMERICAN TELEGRAPH CODE, 4th Edition; \$3.50.

BLOOMER, J. G.—Commercial Cryptograph. A Telegraphic Code and Double Index, Holocryptic Cipher; \$5.

GUIDE TO CORRECTION OF ERRORS.—In Code and other Telegrams; \$2.50.

HAWKE, W. H.—Premier Cypher Telegraphic Code; \$5.

LARABEE, CHARLES S.—Cipher, Letter and Telegraph Code; \$1.

LIEBER, B. FRANKLIN.—Telegraphic Cipher Code; \$12.

MCNEILL, BEDFORD.—Code; \$7.50.

MOREING, C. A.—Telegraphic Mining Code; \$8.50.

OFFICIAL VOCABULARY.—Four large volumes and index, comprising 1,500,000 words suitable for use in arranging cipher codes; \$30.

POSTAL TELEGRAPH.—Cable Code; \$2.50.

ROBINSON, S. L.—The Robinson Telegraphic Cipher; \$2.50.

SHAY'S CODE; \$5.

SEEGER, CHARLES L.—Manufacturers' Export Code; \$10.

SLATER, R.—Telegraphic Code; \$4.

TELEGRAPH CIPHER WORDS of ten letters each; 8,000 words and phrases; \$3.

THE UNIVERSAL TELEGRAPH CIPHER CODE; \$1.

WESTERN UNION TELEGRAPHIC CODE AND INTERNATIONAL CABLE DIRECTORY; \$15.

Any other code can be furnished on order.

Postal or express charges on Cable Code Books are not prepaid; they are sent collect.

Any book in this catalogue, or any electrical book published, American or foreign, will be sent promptly to any address in the world, postage or express charges prepaid, unless otherwise specified, on receipt of price. Address and make post office money orders, express orders, drafts and checks, etc., payable to J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

Wait for the "AUTO-DOT" Transmitter.

IT WILL SOON BE ON THE MARKET.

Invented by Patrick B. Delany.

It is a perfect transmitter, mechanically and electrically. Mutilated dots are impossible. Signals will go farther and through more repeaters than is possible from the best Morse key sending.

It will make dots for an indefinite time and with absolute uniformity.

This transmitter is not a toy, a makeshift or an experiment.

Expert operators who have had experience with other transmitters are invited to call and try the "Auto-dot" at 20 Broad street, Room 1804, New York.



The HAMMOND TYPEWRITER

BEST :: ADAPTED :: FOR :: TELEGRAPH :: OPERATORS

SPECIAL FEATURES: Work in Sight Perfect Alignment
Any Width of Paper Automatic Impression
Interchangeable Type Swift and True
Excels in Beauty of Work and Durability

THE HAMMOND TYPEWRITER COMPANY

Factory and General Offices: 69th to 70th Street & East River New York, N. Y.

JOHN A. ROEBLING'S SONS' CO.

OF NEW YORK

MANUFACTURERS OF

IRON, STEEL
AND COPPER

Telegraph Wires

UNDERGROUND AND SUBMARINE CABLES.
INSULATED WIRES.

WORKS
Trenton, N. J.

NEW YORK OFFICE
117, 119 and 121 Liberty St.



I CURED MY RUPTURE

I Will Show You How To Cure Yours
FREE.

I was helpless and bed-ridden for years from a double rupture. No truss could hold. Doctors said I would die if not operated on. I fooled them all and cured myself by a simple discovery. I will send the cure free by mail if you write for it. It cured me and has since cured thousands. It will cure you. Write to-day. Capt. W. A. Collings, Box 393 Watertown, N. Y.

THE PHILLIPS CODE.

PRICE, \$1.00.

A thoroughly tested method of Shorthand, arranged for Telegraphic Purposes and contemplating the rapid transmission of press reports, also intended to be used as an easily acquired method for General Newspaper and Court Reporting.

Address,

J. B. TALTAVALL,
TELEGRAPH AGE, 263 BROADWAY
NEW YORK.

TRADE MARK
"Chloride Accumulator"
REGISTERED SEPTEMBER 11, 1894.

SPECIAL TYPES OF THE
"Chloride Accumulator" for Telegraph Service
THE ELECTRIC STORAGE BATTERY CO.

SALES OFFICES: New York, 100 Broadway. St. Louis, Wainwright Bldg. Cleveland, Citizens' Bldg.
Boston, 60 State St. San Francisco, Elatio Bldg. Philadelphia, Allegheny Ave. and 19th St.
Chicago, Marquette Bldg. Canada, Canadian General Electric Co., Ltd., Toronto.
Mexico, Chas. L. Seeger, Primera de Humboldt No. 10. Havana, Cuba, G. F. Greenwood, Mgr., 34 Empedrado St.

GOLD AND STOCK LIFE INSURANCE ASSOCIATION.
TWENTY-NINTH YEAR.

INITIATION FEE, \$1.00. For Telegraphers and Others in Electrical Service.
Dues according to age at entry: INSURANCE, \$500.00 in payments of \$50.00 per Month for Ten Consecutive Months.
Between 18 and 30, 80 cts. per month. Between 35 and 40, 75 cts. per month. Between 45 and 50, 81 cts. per month.
Between 30 and 35, 80 cts. per month. Between 40 and 45, 81 cts. per month.
WM. J. DEALY, Secretary,
195 Broadway, New York.

The 1906
**Remington-Sholes
Typewriter**

with its interchangeable Platens, Interchangeable Carriages, Two Color Ribbon Device, Light, Easy, Elastic Key Action; runs smoothly, steadily, noiselessly and stands up under the hardest usage.

It has been used by the winners in every important public telegraph speed contest since 1898 and by thousands of expert operators everywhere. The Remington-Sholes is fully guaranteed and is offered to commercial and railroad telegraphers as the best "mill" for all around use that money and skill can produce. We send them anywhere on ten days' test to prove their worth and superiority.

Write today for catalogue and name of the nearest representative.
We also want good agents in unoccupied territory.

THE ARITHMOGRAPH CO.
1054 Majestic Bldg., Chicago

**HOLTZER-CABOT
DYNAMOTORS AND
MOTOR-GENERATORS**

Are Being Extensively Used



BY THE
WESTERN UNION TELEGRAPH CO.
AND THE
POSTAL TELEGRAPH - CABLE CO.
DESCRIBED IN BULLETIN 302

THE HOLTZER-CABOT ELEC. CO.
BOSTON (BRO KLINE) MASS.
New York Philadelphia Chicago

BIG STEEL RANGE, \$8.75

FOR ONLY \$8.75 we furnish a BIG, NEW, 1906 STYLE STEEL RANGE: \$12.75 for the same range, complete with high warming closet and porcelain lined reservoir. A large illustration and complete description of this WONDERFUL STEEL RANGE BARGAIN is shown in our NEW FREE STOVE CATALOGUE. WRITE FOR IT. OUR ACME TRIUMPH STEEL RANGE, (ter, exactly as illustrated hereon, is the highest grade range made in the world, and on it we make a WONDERFUL FREE OFFER. We will place this beautiful range in your own home on thirty days' free trial, and if you do not find it the finest range you ever saw, it will not cost you one cent. This Great Free Trial Offer Range is shown in our FREE Stove Catalogue. In our big Newark, Ohio, stove foundry, the largest in the world, we make 100 a day of this high grade steel range, and our price now will surprise you; it is about one-half what all others ask for a fine steel range. We also make an immense variety of every kind and style of stove, the finest, big cast iron and steel ranges, cast iron and steel cook stoves, any kind for any purpose to burn any fuel, and all sold for just a trifle more than bare cost of material and labor, very much less than any dealer pays at wholesale, for much less than any other manufacturer has ever offered, by far the most astonishingly low prices ever heard of, and everything is shown in our big FREE Stove Catalogue. The Free Stove Catalogue explains our new terms, the most liberal ever offered, our pay after received plan, our splendid free trial plan, wonderful offers and inducements, marvelously low prices, such prices as surprise even us when we compare them with the prices asked by other dealers; SUCH PRICES AS WILL ASTONISH YOU.



YOU GET THIS BIG HANDSOME MORRIS CHAIR FREE IF YOU BUY FROM US.

If you write for our Big Free Stove Catalogue you will also get our offer of this big full sized, hand carved, claw foot, lion's head arms, full spring seat and back cushion Morris Chair absolutely free to you. CUSHIONS BEAUTIFULLY UPHOLSTERED AND ADJUSTABLE. A MOST WONDERFUL OFFER.

CAN YOU USE A STOVE OF ANY KIND, if the price is low enough, the extra inducements like the free Morris chair strong enough, the offer liberal enough, could you use a good cook stove for \$2.69? Write for our Free Stove Catalogue and see the stove we offer for only \$2.69. Don't fail to write for our new wonderful stove catalogue, with all our new offers, inducements and prices if you can make any use of a new stove. Send us a letter or a postal card and say, "Send me your new Free Stove Catalogue" and you will get everything we have here told you about. The complete stove book, all the low prices, all the offers, the free Morris chair proposition, descriptions and pictures of all the stoves and ranges, everything by return mail, absolutely free and postpaid. Do it at once, please. Write us now. Say, "Send me your new Free Stove Catalogue" and you will get everything. Don't miss this stove offer. It is different and so much better than anything you ever heard of. Write for the Free Stove Catalogue this minute. Address, SEARS, ROEBUCK & CO., CHICAGO, ILL.



W. R. OSTRANDER & CO.

MANUFACTURERS OF

Speaking-Tube Goods
Electric Bells
Annunciators
General Electric Supplies

22 DEY STREET, NEW YORK

SEND FOR CATALOGUE

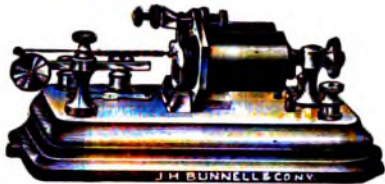
THE NAME

“BUNNELL”

on Telegraph or other Electrical Apparatus is positive Assurance that it is the BEST



THE DOUBLE SPEED TELEGRAPH KEY.



The Finest Relay Ever Constructed.

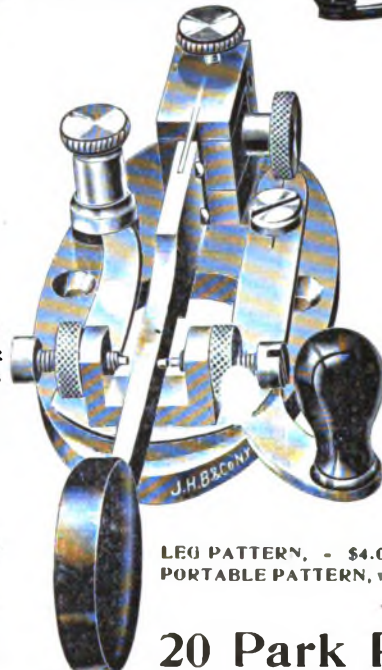
Condemned by every operator at first glance, but on reflection this judgment is quickly reversed, and a trial or demonstration of the Double Speed Key creates enthusiasm, and free predictions that this is the

COMING KEY.

SEND FOR CIRCULAR

J. H. BUNNELL & CO.

MANUFACTURERS, IMPORTERS AND DEALERS IN TELEGRAPH, TELEPHONE, RAILWAY AND ELECTRIC LIGHTING SUPPLIES, INSTRUMENTS, BATTERIES, INSULATED WIRES and LINE EQUIPMENT



PATENTED

LEG PATTERN, - \$4.00 LEGLESS PATTERN, - \$4.50
PORTABLE PATTERN, with wedge and cord for connection with ordinary key, 6.50

Requires but one-half the motions of the ordinary key, and these are made by a side-wise rocking motion of the hand, easily acquired, which guarantees that operators will not be affected with cramp, and those who are so affected will soon recover their

Speed and Style

20 Park Place, New York,
P. O. Box 1286.

MARSHALL'S ELECTRICAL CONDENSERS



MULTIPLE SERIES STANDARD CONDENSER
STANDARD CONDENSERS A SPECIALTY.
Condensers for Telegraph, Telephone, Electric Light and Experimental purposes.
These condensers are used in all telegraph offices in America where standard and ordinary condensers are required. Send for catalogue.
Address WM. MARSHALL,
709 Lexington Ave., nr. 57th St., New York

TRY THIS BICYCLE 10 DAYS FREE



WE WILL SEND YOU THIS BICYCLE to ride ten days FREE, and if you don't say it is the easiest running, highest grade, strongest, handsomest, most graceful, comfortable and easy riding bicycle you ever saw, the ten days' trial won't cost you one cent. Our FREE Bicycle Catalogue shows this great genuine ten days' free trial offer. \$11.75 BUYS OUR NEW 1906 MODEL KENWOOD, the long famous \$75.00 bicycle, strictly high grade, worth three of the bicycles sold by others at \$15.00 to \$25.00, a wonderful model, guaranteed for two years and offered on ten days' free trial, all fully illustrated and described in our new Free Special Bicycle Catalogue. In our Free Bicycle Catalogue we show our entire line of beautiful new 1906 model bicycles for men, women, boys and girls, the finest wheels ever put on the market, and our low prices, liberal terms, guarantees, free trial plan, offers, induce the FREE Bicycle Catalogue.

ments and privileges will surprise you. Write at once for THIS SILVERWARE SET FREE YOU CAN GET THIS HANDSOME INITIAL SILVERWARE SET (any initial engraved and complete in leatherette case) FREE if you buy from us or take orders for a few bicycles or you can get your choice of a gun, camera, watch, clock, suit of clothes or many other valuable articles given FREE for sending us your orders. This astonishing offer is also shown in our Free Bicycle Catalogue. Write us a letter or postal now and say: "Send me your Free Bicycle Catalogue," and the big book with handsome pictures of all our new bicycles, showing every piece and part, why our bicycles are the highest grade bicycles made in the world, the wonderful construction which makes them so easy running, so strong and durable, why we can make such wonderfully low prices, such liberal terms, such remarkable offers, such broad guarantees, the free silverware offer, our other offers of valuable articles free, everything will be sent to you at once by return mail, FREE and postpaid. DON'T FAIL TO GET OUR NEW 1906 BICYCLE PROPOSITION; it's a marvelous offer. Write this minute. Address, SEARS, ROEBUCK & CO., CHICAGO, ILLINOIS.



HUDSON'S WORD REGISTER



A simple, accurate device for counting the words written upon the typewriter. It is easily read, instantly set, and covers both message and special work. Price by mail, with full directions for attaching and operating, \$3.00. State what machine you use. Circular free. Address

GEO. E. HUDSON,
Sheridanville, Pa.

THE PHILLIPS CODE.

PRICE, \$1.00

A thoroughly tested method of Shorthand, arranged for Telegraphic Purposes and contemplating the rapid transmission of press reports, also intended to be used as an easily acquired method for General Newspaper and Court Reporting.

Address,

J. B. TALTAVALL,

Telegraph Age, 253 Broadway, New York

Standard Underground Cable Co.,



Wires, Cables, Accessories.

RAILWAY, ELECTRIC LIGHT, TELEPHONE, TELEGRAPH. For Aerial, Underground and Submarine Use.

NEW YORK PHILADELPHIA CHICAGO PITTSBURGH BOSTON SAN FRANCISCO ST. LOUIS

TELEGRAPH AGE

No. 7.

NEW YORK, APRIL 1, 1906.

VOL. XXIV.

CONTENTS.

Some Points on Electricity—The Storage Battery.....	139
Recent Telegraph Patents.....	140
Personal Mention. The Railroad. Railway Signal Association...	141
The Cable. Resignations and Appointments.....	142
General Mention. Obituary.....	143
Wireless Telegraphy. Timber Exhaustion.....	144
Braun's New Method of Directing Wireless Messages.....	145
The Commercial Future of Wireless Telegraphy.....	146
Mr. Baker on Earning Promotion. Telegraph Poles.....	147
Large Gifts to Institute Building Fund.....	148
Twelve Hundred Thousand Miles of Wire. Legal. Holland Telegraph Statistics.....	149
The Invention of the Telephone.....	150
Edison's "Haunted" Room Scares Guest. The Telegraphic Type- writer.....	151
The Faith of Professor Morse.....	152
Looking Backward at Omaha.....	153
How the Telegraph Operator Surprised the Actor. The Rousset Printing Telegraph System.....	154
The English Convention of Electrical Engineers. The Telegraph Tree.....	155
Lifted His Scalp. Preserve Your Papers.....	156
John E. Wright. Expert Telegraph Inventor.....	157
Book Notices. St. Louis. Western Union; Philadelphia. Western Union; Baltimore. Western Union.....	158
Philadelphia. Postal; New York. Western Union.....	159
The New York Telegraphers' Aid Society Election. New York. Postal.....	160
Business Notices. Recent New York Visitors.....	161
Municipal Electricians.....	162

SOME POINTS ON ELECTRICITY.

The Storage Battery.

Part II.

BY WILLIS H. JONES.

As was stated in the preceding instalment of this article, everything depends upon the proper handling of the storage battery so far as its total output is concerned. That is to say, the cells must be charged and discharged at as near their normal rate as possible in order to obtain the best results. They may be charged at a slower rate than their normal allowance with equally good results, provided the time can be afforded to do so, but a greater rate of charging will diminish the possible total output.

To make this point clear let us take for illustration a one-hundred-ampere-hour cell and charge it as its normal rate, which is ten amperes per hour for a period of ten hours. If the cell is then discharged, that is to say, current be drawn from it at the same rate, ten amperes per hour, it will in turn yield practically one hundred amperes of current continuously for ten hours. Had the cell been charged and discharged at double that rate, or twenty amperes per hour, we would probably find it exhausted after about eighty-five amperes of current had been delivered. On the other hand, if plenty of time is allowed and we charge it slowly at the rate of, say, five amperes

per hour, or just half the volume permissible for that size cell, it is possible to get as much as one hundred and twenty amperes out of it if not used up at a greater rate than that with which it was charged.

This gain or loss, respectively, in the cells' final capacity, due to different charging rates, is partly explained by the different values of energy uselessly expended by the current in heating the circuit. This heat loss is proportioned to the square of the volume of current flowing, hence to double or halve the volume of current flowing in a circuit increases or diminishes, respectively, the heat energy loss four fold.

The normal charging and discharging rate of a storage battery is usually one-tenth of its rated current capacity continued for ten hours. Thus the proper rate, both ways, for a one hundred ampere-hour cell is ten amperes per hour, while one ampere per hour constitutes the rate for a ten ampere-hour cell.

The current capacity of a storage cell is not only proportional to the superficial area of its plates, but also to the sponginess, or absorbing facilities the latter offer. Hence we see the bearing the charging rate has on its possible capacity. Like a bucket possessing a porous inner lining, it is obvious that if filled faster than the pores can absorb, the vessel will become apparently full and overflow with a smaller intake of fluid than might have been placed therein had the rate of filling been slow enough to permit the pores to store more of it away before the brim was reached. The normal, or preferred rate of charge, therefore, is represented by a medium flow of current, such as experience has demonstrated insures the best all around results under ordinary working conditions.

With the knowledge of these facts at hand the problem of selecting storage cells of proper capacity for any particular kind of work should not be in the least perplexing. Simply estimate as closely as possible the probable daily average rate per hour of current that may be required for all purposes and multiply the result by ten. Thus, if the rate or drain per hour is found to be ten amperes per hour the cell must be of one hundred ampere-hour capacity at least. A five ampere-hour rate would require a cell of fifty ampere-hour capacity, while other rate values would require cell capacities in corresponding proportions.

This rule, of course, is only strictly true from a theoretical standpoint. That is to say, it could be followed for maximum results if the estimated

drain per hour remained permanently unchanged. In practice, however, allowance must be made for future alterations in the volume of current likely to be required, due to natural growth as well as to temporary and sometimes rather extended calls during emergencies.

For this reason an ample margin in the way of cell capacity is required, to provide for which the only remedy lies in installing larger cells than would otherwise be absolutely necessary. It is always well, however, and economical, all points considered, to install storage cells having a normal discharge rate as near that of the estimated hourly current demand as possible.

In an article written by William Finn for *Telegraph Age*, published several years ago, the following interesting information concerning the construction, assembly and charging of the cell may be found:

"In setting up an accumulator cell, a certain definite number of plates are used (depending upon the capacity of the cell) of which all the peroxide plates are electrically connected together to form the positive element, and all the simple lead plates similarly arranged and connected to form the negative element. The different elements are disposed with regard to each other in the cell in much the same way as the sheets of tin foil in a condenser; that is, each positive plate is placed between two negative plates so that there is always one more of the latter than of the former; a five-plate element, for example, being composed of three positive and two negatives; an eleven-plate element of five positives and six negative plates, and so on.

"The positive plates are thus exposed on both sides to the negative surfaces, which arrangement, combined with their proximity, tends to produce an extremely low internal resistance, which is the most essential feature of an efficient accumulator.

"By a very ingenious manipulation of the solution in a cell the voltage is maintained at a nearly uniform pressure during the major portion of the period of discharge.

"A weak solution of sulphuric acid has a high resistance, which gradually diminishes as more acid is added. When, however, its specific gravity reaches a point represented by 1.215 (unity being expressed by 1.000), the liquid acquires its maximum conductivity, after which the addition of more acid increases the resistance.

"Now, instead of maintaining the density at this point of least resistance the specific gravity of the solution is allowed to increase to 1.300, which has the effect of slightly diminishing the conductivity of the solution at a time when the battery is fully charged.

"The object of this will be apparent when the fact is considered that a fully charged storage battery possesses a higher initial electromotive force than subsequently, so that as the cell discharges and its electromotive force falls the conductivity

of the acid rises and thus tends to keep the voltage at a more constant value."

(To be continued.)

[Important articles by Mr. Jones, appearing in back numbers, dating from January 1, 1904, copies of which may be had at twenty-five cents apiece, are as follows: A Useful and Simple Testing Device, January 1, 1904; The Bad Sender, His Past and Future, January 16; The Transmitting Typewriter Wire Connections, February 16; A New Transformer for the Alternating Current Quadruplex (J. C. Barclay, patent), March 1; Definitions of Electrical Terms—Unabridged, March 16 to April 16, Inc.; June 1 to July 16, Inc.; The Future Quadruplex (S. D. Field's invention), May 1-16; The Guegan Multiplex, August 1; Proper Adjustment of Telegraph Apparatus, August 16-Sept. 1; Practical Information for Operators, October 1 to Dec. 1, Inc.; Switchboard Practice at Intermediate Stations, December 16; Definition of the Terms Cycle, Period, Frequency, etc., Diagrams Interpreted, January 1, 1905; Lessons from the December Storm, January 16; The Bonus Wire, February 1; A Few Useful Methods, February 16; Co-operation, A Hint for Wire and Quad Chiefs, March 1; Measuring Resistance by Voltmeter Alone—Something About Ground Wires, March 16; Elementary Information Concerning Household Electrical Appliances, April 1 to May 1, Inc.; The Barclay Printing Telegraph System, May 16; Polarized and Self-Adjusting Relays for Single Line Circuits, June 1; Limitations of Quadruplex Circuits, June 16; Electric Power From the Clouds, July 16; Concerning Condensers and Retardation Resistance Coils, August 1; District Call Box Service, August 16; The Art of Studying, Sept. 1; Other Methods of Splitting a Loop, Sept. 16; The Sextuplex, Oct. 1; A Few Questions Answered, Oct. 16; Positive and Negative Currents, Nov. 1; The Education and Elevation of a Chief Operator, Nov. 16; A Study of an Electric Circuit—Definition of the Principal Terms of Factors Which Regulate its Practical Output, Dec. 1; The Telephone—First Principles, Dec. 16, and Jan. 1, 1906; Questions Answered, Jan. 16; The Dynamic Series, Shunt and Compound Wound, Feb. 1-16, March 1; The Storage Battery, March 16.]

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

Recent Telegraph Patents.

A patent, No. 309,314, for a telegraph system, has been awarded to W. Barnley, of North East, Pa.

A patent, No. 815,322, for the art of telegraphy, has been obtained by Daniel M. Therrell, of Charleston, S. C. The step in the art of the electrical transmission and reproduction of sound which consists in making the terminal transmitter circuit or circuits wholly or partially resonant for the essential frequencies to be transmitted, thereby increasing the efficiency of transformation, and the energy transferred to the secondary circuit, substantially as set forth.

A patent, No. 814,501, for a relay, has been issued to James Allen, of the United States Army. A coil is mounted for a deflective movement between the poles of a magnet, a contact tongue being mounted for movement by the coil. Contact stops for the tongue, an armature mounted for movement by the coil but independent of its magnetization, and a pair of auxiliary adjustable pole pieces, between which the armature is arranged to oscillate, complete the apparatus.

A patent, No. 814,478, for a telephone or telegraph system, has been granted to Georg Ritter, of Stuttgart, Germany. Combined with a main-line circuit and a number of sub-station instruments connected to the main-line circuit are a controlling device at each sub-station operating directly to render its sub-station instrument inoperative, an electric circuit including the controlling devices, mechanism at each sub-station arranged to regulate the admission of electric current to the circuit connecting the electric

devices, and to render its own disconnecting device inoperative, and means at each sub-station arranged to prevent the operation of its own controlling device.

Personal Mention.

Mr. W. S. Kelley has recently been appointed chief engineer of the Holtzer-Cabot Electric Company at Boston (Brookline), Mass.

Mr. Emmett Howard, the well-known old-time telegrapher of Memphis, Tenn., for many years manager of the Western Union Telegraph Company at that point, has gone to Archer, Fla., where he will engage in other business.

The Railroad.

A patent, No. 814,761, for a telegraphic safety device, has been issued to Selden R. Wright, of Morton, N. Y., assignor to the Circuit Protecting Relay Company, Rochester, N. Y.

The Association of Railway Telegraph Superintendents, which meets this year at Denver, Colorado, on June 20, will make the Adams Hotel its headquarters. President E. E. Torrey has added the following named gentlemen to the committee of arrangements: J. M. Walker, superintendent of telegraph of the Denver and Rio Grande Railroad, and E. E. McClintock, superintendent of telegraph of the Mountain Telegraph Company, both of Denver.

The second annual electrical night of the New York Railroad Club was held March 16 at Carnegie Hall, New York City. The meeting was called to order by President H. H. Vreeland, and a paper read by Mr. B. G. Lamme, Pittsburg, Pa., entitled "Alternating-Current Electric Systems for Heavy Railway Service." This meeting was remarkable on account of the number of railroad officials present, all of whom manifested intense interest in the subject of electrification of the steam railroad.

The pamphlet, entitled "Advance Notice No. 2," of the Railway Signal Association, has made its appearance. The full text of the constitution as revised during the current year is given; also the several papers that were read and discussed at the regular meeting of the association, which was held at the Great Northern Hotel, Chicago, March 19, as mentioned elsewhere. The pamphlet also gives a record of the New York meeting, including the verbatim discussion of the several papers which were read on that occasion. These proceedings are issued under the direction of H. S. Balliet, the secretary of the association, Grand Central Station, New York.

The cause of the recent wreck on the Denver and Rio Grande Railroad, by which twenty-three lives were lost, is explained by the fact that the telegraph operator at fault had undoubtedly been asleep and did not hear the train go by. He O. K.'d the dispatcher's order and is held by the company as the sole cause of the collision.

He was the day operator and was doing duty for the night operator as the latter had gone to Pueblo to cash pay checks without asking permission from the Pueblo office. The company's standing rule is that day operators are not to relieve night operators and work overtime unless permission is asked and granted by the chief dispatcher.

RAILWAY SIGNAL ASSOCIATION.

The Railway Signal Association held its regular March meeting at the Great Northern Hotel, Chicago, March 19. Vice-President J. A. Peabody, of the Chicago and North-Western Railway, presided. H. S. Balliet, of New York, secretary, was also present. About seventy-five persons were in attendance at the two sessions, and forty new members were elected. The revised constitution, as published in the notice of the meeting, was discussed, and a number of changes made. It was recommended that with these corrections it be presented at the New York meeting in May for adoption. At the second session the following papers were read and discussed: "Charging of Storage Batteries from Alternating-current Circuits," by F. B. Corey, of the General Electric Company; "Substituting Track Circuits for Detector Bars," by W. N. Spangler, supervisor of signals of the West Jersey and Seashore Railroad, and "The Power Distant Signal," by W. A. D. Short, signal engineer of the Illinois Central Railroad.

Mr. Corey in his paper upon the charging of storage batteries described the mercury arc rectifier, beginning with a general description of the mercury vapor arc lamp aside from its special application to the rectifier.

In order to show exactly what transpires in the rectifier tube, Mr. Corey introduced a series of oscillograph records, which gave accurate measures of the instantaneous values of currents and electromotive force in the various circuits. One of these curves showed the variation of current at the two anodes simultaneously. It was interesting to note that the current as shown in the curve was very far from its original sine curve, this distortion being the result of the reactances. The anode curves overlapped by an angle of approximately twenty degrees. Another illustration showed two simultaneous records, the lower curve being the impressed electromotive force and the upper curve the direct current flowing from one cathode shown in its relation to the zero line. In this case the indentation of the current curve was approximately thirty per cent. of its maximum ordinate. If for any reason it is desirable to further reduce the amplitude of these pulsations it may be readily accomplished by means of special reactances and without any great loss in efficiency of the rectifier.

Another curve showed the voltage in charge and discharge of one reactance coil and its relation to the impressed electromotive force, while still another showed the voltage between one anode and

the cathode and its relation to the impressed electromotive force. This latter figure also showed the constant voltage drop of fourteen volts, while the arc is maintained. The length of time that the arc is held after the impressed electromotive force has reached the zero value was also shown by a curve.

The Cable.

Mr. George G. Ward, of New York, vice-president and general manager of the Commercial Cable Company, New York, accompanied by his wife, arrived at Colombo, Ceylon, on March 24, en route to China and Japan.

Speaker Cannon, of the House of Representatives, has received a letter from Secretary Root urging that the bill appropriating \$77,712 to reimburse the French Cable Company for losses sustained by the cutting of its cables in Cuba in the Spanish-American war, be passed. Mr. Root says the claim is just and should be allowed at this session.

The converted cable steamer, "Urnston Grange," of London, Eng., arrived at Guam, March 26, having on board the Commercial Pacific Cable Company's cable to be laid between Guam and Japan, a distance approximating 1,500 miles. The shore end was laid on March 28, and the work of paying out began on March 30. The laying of the cable, if all goes well, should be completed in eight days.

Cables remaining interrupted March 28 were those of Port Arthur-Chefoo, interrupted March, 1904; Cadiz-Teneriffe, interrupted July 20, 1905; St. Jacques-Haiphong, interrupted February 14, 1906; Tangier-Cadiz, interrupted February 18, 1906; Jamaica-Colon, interrupted January 9, 1905; Martinique-Port Plata, interrupted October 30, 1905; Cayenne-Pinheiro, interrupted August 13, 1902; Curacao-Venezuela, suspended January 12, 1906.

Capt. W. L. Candee, managing director of the Okonite Company, New York, accompanied by his wife, returned from England a few days since, whither he recently went on a business trip. On the same steamer was Mr. L. G. Martin, a former expert cable operator, now identified with the Okonite Company, who was returning from an extended trip to Japan and China. In the interests of the Okonite company he completed at Shanghai, China, the work of laying the underground cable connecting the city office at that point with the shore end of the Commercial Pacific Cable Company's cable, soon to be laid, covering a distance of fifteen miles.

The cable steamer "Silvertown," of London, Eng., having on board the Commercial Pacific Cable Company's cable to be laid between Manila and Shanghai, a distance of about 1,200 miles, arrived at Manila on March 22. The shore end of the cable was landed on the morning of

March 24. The ship stood off some distance from the shore because of the shallow water. The shore end was landed by means of a lighter. This work occupied the greater part of the day. At 6 P. M. on March 24, the Silvertown commenced paying out across Dewey's line of battle and toward Shanghai. The work of laying the cable is proceeding without mishap.

Resignations and Appointments.

The following changes have occurred in the Western Union Telegraph Company's service:

Mr. James A. Prentice, a former incumbent, has been appointed manager of the office at Pittsfield, Mass., vice Mrs. S. W. Hayward, resigned.

Mr. F. H. Heidt, of the Columbia, S. C., office, has been appointed manager at Anderson, S. C., vice T. E. Howard, resigned to enter other business.

Mr. George H. Gilbert, manager of the office at Clarksville, Tenn., has resigned to accept a position in the Nashville office, that state. He is succeeded by Augustus Coke.

Mr. H. W. Gilbert, formerly manager of the New York Produce Exchange office, has been appointed manager at Albany, Ga., vice C. H. Walton, resigned to return to Washington, D. C.

Mr. J. S. Nickells, manager at Huntington, W. Va., has been transferred to a like position at Greensboro, N. C., the vacancy at Huntington being filled by the appointment of R. T. Trent, of the Ashland, W. Va., office.

The following changes have occurred in the Postal Telegraph-Cable Company's service:

Mr. J. R. Hill, manager at Laramie, Wyo., has been transferred as manager to the Cheyenne office.

Mr. Ernest J. Cassidy has been appointed manager at the Chamber of Commerce, Milwaukee, Wis., vice Joseph Ramsey, deceased.

Mr. D. McNicol, of the superintendent of telegraph's office, Northern Pacific Railroad, St. Paul, Minn., has been appointed manager of the office at Butte, Mont.

Mr. E. Y. Ouderkirk, manager of the office at Johnstown, Pa., has resigned to enter other business, the vacancy being filled by the appointment of Mr. Leo Kerns, formerly night operator of the office, but latterly stationed at Pittsburg.

Mr. R. E. McCord, night chief of the Great North-Western Telegraph Company, Montreal, Que., has resigned to accept the appointment of superintendent of the Dominion De Forest Wireless Telegraph Company, with jurisdiction from Toronto to Quebec.

General Mention.

The Commercial Telegraphers' Union of America will hold its third national convention in Cincinnati during the week beginning May 7.

The Central Typewriter Company, of Chicago, of which O. T. Anderson, a well-known telegrapher, is president, has a very fine exhibit at the National Business Show, now being held in that city.

The state of Chihuahua, Mexico, has just granted to Col. W. C. Greene of New York and associates a valuable concession, which includes the right to build telegraph and telephone lines in that state.

The new building now in course of construction at Bisbee, Arizona, to cost \$10,000, in which will be located the office of the Postal Telegraph-Cable Company, will be given the name of the Postal Telegraph Building.

The recent strike among postal and telegraph employes, it is said, has convinced the Russian government that women are more reliable than men, and henceforth only women will be accepted in the postal and telegraphic classes.

A strike of messenger boys in Syracuse, N. Y., a few days ago was due to the new and peculiar fact that the larger boys would not work with the smaller, whom they denominated as "kids," refusing to return to work until the little fellows were discharged.

The sub-committee of the United States Senate having in charge the anti-pass and telegraph frank bill, have killed the measure. The members of that dignified body apparently could not forego the pleasure of riding free on railroads or deadheading their telegrams.

Mr. J. W. Connors, an old-time telegrapher and a story writer of considerable ability, well-known in Montana and other western states, and who has been in the government employ for several years past, has re-entered the telegraph service and is located at Beardstown, Ill., as train dispatcher for the Chicago, Burlington and Quincy Railroad.

The private wire of the Standard Underground Cable Company between New York, Philadelphia and Pittsburg and their factory at Perth Amboy, N. J., is giving excellent satisfaction. Charles A. Lawrence, of Pittsburg, is the chief operator of this private system, the executive offices of which are located in the Westinghouse building, that city. P. A. Le Blanc, of New York; James Long Schoonover, of Perth Amboy, and Christian Troeller, Jr., of Philadelphia, constitute the telegraph force.

Mr. J. A. Fortier, of the Canadian Pacific Railway's telegraphs at Montreal, Que., who was sent to Toronto to represent his company on the occasion of the banquet recently given by Sir

Wilfrid Laurier, rendered good service in being able to handle all the press matter for the different French papers throughout the Province of Quebec. Mr. Fortier, who is an old employee of the company, is also press operator for "Le Canada" in Montreal, and, being conversant with both the French and English languages, proved his value on the occasion named.

Mr. W. A. Logan, traveling solicitor of the Postal Telegraph-Cable Company of Texas, with headquarters at Dallas, that state, in a recent letter remarks that the best way to keep posted on current events in the telegraph and in the study of the same, is to subscribe for and to read TELEGRAPH AGE. He says: "I know when I find a man who is a careful and interested reader of the Age that I have found one who is going to make for himself something better than his present position. I am sure that I have read more good advice to the telegraph fraternity in TELEGRAPH AGE than I have ever found in all other periodicals combined."

Obituary.

Samuel L. Black, aged thirty-seven years, for fifteen years a telegraph operator, died at Calais, Me., on March 24.

Miss Eliza Cameron, manager of the Great North-Western Telegraph Company at Renfrew, Ont., died of typhoid fever on March 7.

Miss Hattie M. Adams, manager of the Western Union Telegraph Company at Fergus Falls, Minn., died of typhoid fever on March 17.

Joseph J. Durkin, aged twenty-one years, an operator for The Publishers' Press, employed by the "Daily Freeman," Kingston, N. Y., died March 6.

J. H. Kelly, aged thirty-six years, formerly an operator of the Postal Telegraph-Cable Company at Carbondale, Pa., died at Cincinnati, Ohio, March 12.

Edwin L. Ryder, aged sixty years, a former telegraph operator and latterly in the coal business, died at Vincennes, Ind., March 17. He was night manager of the Western Union Telegraph Company at Cincinnati when the Civil War broke out and was made operator at Camp Dennison, near that city, when troops began mobilizing. Later he became assistant general superintendent of the Ohio and Mississippi Railroad, afterwards division superintendent of the Iron Mountain and of the Missouri Pacific Railway system, respectively.

George Farnsworth, an official of the Bell Telephone Company at Detroit, Mich., and an old-time telegrapher, died in that city March 23, aged seventy years. In youth he learned telegraphy and became manager for the Cleveland and Erie Telegraph Company, which he was also interested in building. He was one of the builders

of the first telegraph line from Pittsburg to New Orleans, and aided in restoring Chicago's telegraphic communication with the outside world after the great fire. He aided in the construction of the Atlantic and Pacific telegraph lines in Michigan, becoming manager of the company at Detroit, and later built the Mutual Union lines between Chicago, Toledo and Detroit. In 1886 Mr. Farnsworth built the Michigan Postal Telegraph Company's lines and became a stockholder in that concern, which in 1891 was absorbed by the Postal Telegraph-Cable Company.

Samuel Hay Kauffman, president of the Evening Star Newspaper Company, Washington, D. C., died in that city March 16. He was born in Wayne County, Ohio, April 30, 1829, and therefore had nearly reached his seventy-seventh year. Early in life he learned the printing business and thus gained his first interest in newspaper work. He also learned telegraphy and at Wooster, Ohio, acted as operator for about three years, during which time he taught telegraphy to General Thomas T. Eckert, former president of the Western Union Telegraph Company. Mr. Kauffman always retained an interest in telegraphy and his acquaintance among telegraph men was extensive and cordial. In 1861 he was called to Washington by Secretary of the Treasury Chase and appointed to a confidential and responsible position in the Treasury Department. He was one of the founders of the American Newspaper Publishers' Association and for three terms was its president.

Wireless Telegraphy.

The British post office, which manages the telegraph business of the country, has adopted the word "radio" as the designation for a wireless telegram.

Another instance which proves the utility and great value of wireless telegraphy equipment on steamers at sea is shown by the fact that the Kaiser Wilhelm the Second, which arrived in New York on March 21, while in mid-ocean telegraphed the New York agents that the steamer had met with unusually rough weather and would be ten hours late in reaching port.

At the opening of the Newfoundland Legislature, the governor announced the conclusion of an agreement with the Marconi Telegram Company to operate a wireless system along the Labrador coast, which would be connected with the postal telegraphic service of the Colony. The agreement also stipulated that all ocean messages received by the Marconi stations on the island should be forwarded to their destination over the government cable, which connects with the Commercial Cable Company at Canso, Nova Scotia.

The American De Forest Wireless Telegraph Company has opened a Boston office for wireless telegraph business in the basement of the Equi-

table Building, that city. The sending station proper is in M street, South Boston. The rates are as follows: From Boston to Hartford, New Haven and Bridgeport, Conn., New York and Philadelphia and between those points, 20 and 1; from the Connecticut offices to Atlantic City, N. J., 30 and 3, to Sea Bright, N. J., 25 and 2; from New York and Philadelphia to the New Jersey points, 20 and 2; between any of the above points and Cape Hatteras, N. C., 40 and 3. The company expects to open offices at Portland, Maine, Providence, R. I., and Springfield, Mass., very soon.

Legislation for United States Government control of commercial wireless telegraph stations, in accordance with the recommendations of the interdepartmental board appointed by the President two years ago, will be urged on Congress by Secretary Bonaparte. Under the terms of a bill drafted by the board commercial wireless stations would be subject to regulation by the Department of Commerce and Labor and no station could be established until a license had been obtained. This bill has been pigeonholed until now, but the interests of the navy are said to make it imperative that private stations be regulated because of their interference with the government service. The bill proposing to enact the desired legislation will probably be introduced in the House and Senate at this session.

Timber Exhaustion.

Consul Ifft, of Chatham, Ont., contributes a valuable chapter on the future wood supply of this continent, bearing specially on the devastation of American forests, which threatens the United States with a great timber shortage a few generations hence. The consul's report covers a Canadian forestry convention, where timber statistics, the wood-pulp industry, wood supply of railroads, telegraph and telephone companies, etc., were discussed. The report in part says:

"Without reference to the general forest policy for Canada as suggested by the Canadian Forestry Convention, which was held at Ottawa in mid-January, some of the statistics presented at the sessions of the convention were of noteworthy interest. Especially was this the fact in regard to statistics of the wood supply and requirement of the railroads and telegraph companies, the wood-pulp and paper industry, and the wood supply for the manufacturer. One speaker referred to the common impression that when the United States timber supply was exhausted it could draw upon Canada. This was, he said, a mistake. The estimated quantity of matured timber in Canada is five hundred and thirty-two billion feet, and that at the present rate of consumption would last the United States exactly eleven years."

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

Braun's New Method of Directing Wireless Messages.

BY A. FREDERICK COLLINS.

The first attempts toward directing wireless telegraph messages were made by William Marconi some little time before he had evolved his aerial wire system. His apparatus consisted of a small induction coil fitted with a battery to supply the initial energy, a key to break up the current into the alphabetic code, and a Righi oscillator for radiating the energy in the form of electric waves. In this case the oscillator was mounted in the focal line of a cylindrical parabolic reflector the length and opening of which was double the length of the wave emitted from the oscillator. This arrangement permitted the waves to be concentrated into a beam which could be projected in any desired direction. The receiver consisted of a resonator formed of two plates of metal with a detector connected to and interposed between them; this was likewise placed in the focus of a similar parabolic reflector, the opening of which was oppositely disposed to that of the transmitting reflector. With this combination it was possible to concentrate the waves into a beam, but the scheme was not practicable, at least over any considerable distance, since the oscillator and resonator systems were so limited in size that the emitted wave lacked the requisite amount of energy to be of commercial service.

The writer has previously described a system for directing electric waves invented by Alessandro Artour, of Italy, who by an ingenious arrangement of the spark-gap spheres and aerial wires was enabled to obtain circularly and elliptically polarized electric radiations, thus forming rays capable of being propagated in any direction and without the use of grids to reflect them. Considerable success has attended these experiments, messages having been transmitted over 300 kilometers, while another station less than 100 kilometers distant and outside the effective line could not receive them.

Prof. Ferdinand Braun, of the Strasburg Institute, has recently brought out a new method for directing wireless messages in which it is not necessary to bunch the waves into a ray. His method is based on the theory of wave intensification and rarefaction by interference. Thus, assuming that two aerial radiating wires are tuned to the same period of oscillation and are it should not be difficult to obtain interference phenomena provided the oscillations set up in one of the aerials have a phase difference of a small fraction of a second from those of the other.

While the time difference required between the two series of oscillations is exceedingly small, yet it is not easy to tune both oscillations to the same period and yet differentiate the time sufficiently to produce a lag necessary to bring about the desired interference.

This was finally accomplished in the laboratory by throwing the two series of oscillations out of phase by means of an inductance inserted in one of them near the spark-gap. The results on this small scale seemed to agree fairly well with the theory on which it was based and it was decided by the investigator to try out the system under conditions that prevail in practice, that is, using loftier air wires and grounding the complementary terminal of the spark gap.

The place selected for making the out-of-door tests was the polygon military drill grounds at Strasburg. Three different stations were set up within this limited space, one for sending and the other two for receiving. At the transmitting station, instead of the usual aerial wire there were three radiating wires arranged at equidistant points from each other around the building and several meters from it. The aerials were suspended from the tops of their respective masts in the usual manner. The lower ends of these wires led into the building which housed the transmitting apparatus. The lower terminals of all the aerials were connected to one side of the spark gap, the opposite of the latter being connected to the earth in the ordinary way. Now, when the disruptive discharge took place, the aerials a b c were energized by the oscillations thus set up, but while the oscillations in the aerials b c were exactly in step, those in a lagged slightly, due to the added inductance near the spark gap; yet the values of inductance and capacity remained identical, so that the length of the waves emanating from each remained constant. When all the aerials were emitting waves, those radiated by a would, in virtue of the fact that it was out of phase with b and c, set up an interference, with the result that an electrical shadow was cast in a direction at right angles to the plane of the aerial wires b and c, and hence the radiation of waves in that direction was a minimum. Oppositely, if the oscillations in the aerial a were made to take place in advance of those occurring in b and c, provided the difference in time was rightly proportioned, then a wave more or less amplified would result and its propagation would be in the direction previously stated, while the shadow due to the interference of the waves on b and c was projected from the rear of a.

In this system of amplifying the waves in one direction and diminishing them in another, the greatest difficulty seems to grow out of the fact that it is of the utmost importance to time the period of oscillation with absolute precision; and when it is stated that this difference of phase amounts to approximately only one ten-millionth of a second, it will be seen that the adjustments of the co-efficients are of an extremely delicate nature. From Prof. Braun's experience with high frequency oscillations he concludes that the difference in time between the phases of the aerials can be adjusted to within one two-hundred-millionth part of a second, or more popu-

larly expressed it would amount to a difference of only one second in six years.

Two or three years ago the scheme was tried to form a parabolic reflector of gigantic proportions by arranging a number of aerial wires around a radiating aerial wire so that the latter would be in the focal line. This arrangement failed to produce the desired results since the wires thus placed permitted much of the energy to be lost through dispersion. Prof. Braun investigated the reflection of wires on a scale sufficiently large to show its utter impracticability. He employed waves having a length of 120 meters and placed the radiating aerial wire a distance of 30 meters or a quarter of a wave-length from the reflecting wires, which had an opening equivalent to the length of the waves to be emitted.

By utilizing the three-wire system the large and complicated reflecting-wire scheme is eliminated, the distance of transmission is increased and, what is equally advantageous, it is possible to direct the messages in any one of six directions. Without removing a single connection the waves can be sent in either one of two directions by merely increasing or decreasing the frequency of the oscillations in a so that these will be a ten-millionth of a second faster or slower than the currents that surge through b and c. By changing the relative phase values of a b c, it is obvious that any of six different predetermined directions can be obtained at pleasure.

In the recent experiments made by Prof. Braun and his co-workers, while messages were being transmitted in one direction and received by a station in line with it, a second receiving station at right angles to the line of propagation, though much nearer the transmitter than the first, was not affected.

Should it prove of advantage to transmit in more than six directions, five wires would be used, with the result that any one of ten stations, assuming they were located at equidistant points about the transmitting station, could then be communicated with to the exclusion of all the others. The maximum distance covered in these preliminary trials was 1.3 kilometers; it is stated, however, that a commercial test is to be made at an early date.—Scientific American.

The Commercial Future of Wireless Telegraphy.

In a recent address before the Beacon Society of Boston Mr. John Stone Stone considered at length the commercial future of wireless telegraphy. Before entering on the main subject of his address he noted some recent important improvements in details, according to the "Electrical World." One of these is a means devised by his principal assistant, Mr. Sewell Cabot, whereby the receiving operator in wireless telegraphy can "break in" just as he does in wire telegraphy, and correct any error or ask any question of the transmitting operator that he pleases. At first it was only possible in wireless telegraphy to send

about twelve words a minute with any precision whatever, while at present it is possible to send and receive as fast as on a wire line, a speed of about forty words a minute having been attained. The invention of Mr. Cabot is of great commercial importance, for it obviates repetition to a very great extent, and one may almost say that by means of this invention twice the amount of matter can be transmitted in a given time that would otherwise be possible.

Mr. Stone said that the future of wireless telegraphy depended upon the solution of the problem of selectivity—a problem which he considered had been solved by his system. He did not believe that the wireless telegraph is going to have its greatest field in competing with transatlantic cables. The great field for a selective system of wireless telegraphy is that where the most people live and where most people wish to communicate, and that place is right on land. No considerable competition would, he believed, arise between wire lines and wireless telegraph interests, but rather one will help the other. He drew a distinction between the trunk line service of wireless telegraph companies and the lines, enormously in the majority, which feed this service. The maintenance of the latter costs from thirty to thirty-three per cent. per annum, and they do not yield enough business to pay for this maintenance, money being lost on every message practically that goes over one of the subsidiary lines. The trunk lines, however, are extremely profitable, and more than make up the deficiency. There is a great future for wireless in supplanting these feeders to telegraphic trunk lines—in doing service now done by one and two-wire lines, and even up to the ten-wire lines. In this there would be a very handsome profit, not a mere manufacturer's profit, but a profit on the patents involved as well as on the apparatus. The selective system of wireless telegraphy will not, however, remain long on a par with wire lines in the matter of operation, but will later open up fields of its own in which wire telegraphy cannot compete because of the excessive cost of pole lines and their maintenance. As an example of new applications, Mr. Stone stated that within the next year it will be possible for a ship more than one hundred miles away from the coast to obtain exactly the bearing of any light on the coast within one hundred and fifty or two hundred and fifty miles of the vessel; and not only of one light, but of two or more, and thereby be enabled to determine exactly her position.

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

Better be despised for too anxious apprehension than ruined by too confident a security.—Burke.

Chapter III

On OHMS and SIGNALS

There are only two types of batteries that in any degree meet the rigid requirements of railroad signal engineers. Of these the gravity cell is the older, but it has the disadvantage for many purposes of high internal resistance and incapability of use on open circuit. Choice is therefore limited to the copper oxide cell if any amount of work, such as operating semaphores or signals, is to be done by the current.

The efficiency of the cell depends largely upon the thoroughness with which the copper oxide depolarizer prevents the accumulation of hydrogen gas upon the negative electrode and upon the extent to which the internal resistance of the battery is reduced by the arrangement of its elements. Some of the makers use as the depolarizer low oxides of copper in the form of scale and dust as it comes from the wire and sheet mills, placing



these materials in a perforated metallic vessel which forms the negative electrode. However, as W. R. Cooper remarks in his "Primary Batteries," "This method of using copper oxide is not a very good one for obtaining electrical contact between the negative plate and the depolarizer," and in the construction of the EDISON battery more energetic measures are therefore adopted. The copper plate and oxides are first ground to the utmost fineness, after which they are completely burned to black oxide in a muffle. They are then compressed by 60 tons pressure into brightness, upon the surface of which a thin coating of metallic copper is deposited to give conductivity. This explains why the resistance of our 300-ampere-hour cell is only 0.04 ohm and decreases with the life of the cell. Furthermore, this oxide briquette constitutes the negative electrode, and there is no surface upon which hydrogen will accumulate and reduce the available voltage.

Remember that the volts spent in overcoming internal resistance and the counter effect of hydrogen on the negative electrode are wasted and you will understand why the EDISON battery delivers the most foot pounds of work for a dollar's worth of materials.

Ask for our BOOK "T. A."

Edison Manufacturing Co.

9 Lakeside Avenue
Orange, N. J.

31 Union Square, New York
304 Wabash Avenue, Chicago
25 Clerkenwell Road, London

DIAMONDS



ON CREDIT FOR EASTER GIFTS

CUPID IS OUR BEST AGENT, HE FINDS PLACES FOR DIAMOND RINGS EVERY DAY. HE WORKS AMONG ALL CLASSES, FROM THE MODEST CLERK TO THE WEALTHY EMPLOYER, AND WE FILL HIS ORDERS, OPENING A CONFIDENTIAL CHARGE ACCOUNT WITH EACH OF HIS CLIENTS. THE GOODS ARE DELIVERED AT ONCE. WE ASK

No Security, No Endorsements, No Interest

We open hundreds of confidential charge accounts every business day for Diamond Rings, Pins, Brooches, Lockets, etc., and High Grade Ladies' and Gents' Watches, and the larger percentage of these accounts are with persons who had always considered Genuine Diamonds a luxury until they read our little booklet: "HOW EASILY YOU CAN WEAR AND OWN A DIAMOND." It answers every question, and tells how every honest person, no matter where they live, can select any article they desire from our Million Dollar Stock. Have it sent to them on approval subject to examination, paying only one-fifth the cost on delivery and the balance in eight equal monthly payments.

Buying a Diamond is Not an Extravagance

It is a wise investment in the most valuable, stable and quickest cash producing gem in the world. Diamonds have increased in value more than twenty per cent in the past twelve months and the best of European authorities predict an even greater increase during the coming year.

Our Prices Are From 10 to 15 Per Cent Lower

than the ordinary spot cash retail jeweler. This is made possible by the fact that we are direct importers and sell a thousand Diamonds where the retail jeweler sells but one. Write for our Catalog today.

Our Handsome New Catalog a copy of which will be mailed to you with booklet mentioned above, contains 66 pages and 1,000 illustrations of all that is new and up-to-date in artistic jewelry. It affords you the pleasure of selecting in the privacy of your own home such articles of Jewelry as you may desire for yourself or your loved ones.

Our Guarantee, aside from the fact that we are one of the oldest (est. 1858) and the Largest Jewelry House in the U. S., we give a signed guarantee as to quality and value with every Diamond sold. You can exchange any Diamond bought of us at any time for other Jewelry or larger stone. Write for our Catalog and Booklet. Mailed Free.

The Old Reliable Original Diamonds on Credit House

LOFTIS BROS & CO. 1858

DIAMOND CUTTERS
Watchmakers - Jewelers
Dept. D44 92 to 98 State Street
CHICAGO, ILL., U. S. A.

THE TELEGRAPHERS' MUTUAL BENEFIT ASSOCIATION THIRTY-NINTH YEAR

FOR ALL EMPLOYEES IN TELEGRAPH OR TELEPHONE SERVICE

Insurance, Full Grade, \$1,000; Half Grade, \$500; or Both Grades, \$1,500; Initiation Fee, \$2 for each grade

ASSETS \$250,000. Monthly Assessments at rates according to age at entry. Ages 18 to 30, Full Grade, \$1.00; Half Grade, 50c.; 30 to 35, Full Grade, \$1.25; Half Grade, 65c.; 35 to 40, Full Grade \$1.50; Half Grade, 75c.; 40 to 45 Full Grade, \$2; Half Grade, \$1.

M. J. O'LEARY, Sec'y, P. O. Box 510 NEW YORK.

TELEGRAPHY & TYPEWRITING



WE USE THE
Smith Premier
Typewriter

THE Smith Premier Typewriter

is the simplest and strongest of all writing machines. It does better work, does it quicker, and lasts longer than any other typewriter. It costs less in the long run. It is the

World's Best Typewriter.

Let us send you our little book telling how it is made or the machine itself on trial.

THE SMITH PREMIER TYPEWRITER CO.

HOME OFFICE AND FACTORY, SYRACUSE, N. Y.

BRANCH STORES EVERYWHERE



THE GAMEWELL FIRE ALARM TEL. CO.

19 BARCLAY ST., NEW YORK.

Gold Medal awarded at Berlin, Germany, Exposition of Appliances for Fire Prevention and Fire Extinguishment.

FIRE ALARM and POLICE SIGNAL TELEGRAPHS
For Cities and Towns.

Over 1,000 Plants in Actual Service.

SELLING AGENTS:

- Frank C. Stover,
161-163 Randolph Street, Chicago, Ill.
- The A. J. Coffee Company,
330 Market Street, San Francisco, Cal.
- Oliver P. Croker, Atlanta, Ga.
- A. D. Wheeler,
178 Devonshire Street, Boston, Mass.
- Chas. Berst,
1107 Traction Building, Cincinnati, O.
- Utica Fire-Alarm Telegraph Co., Utica, N. Y.
- General Fire Appliance Co.,
Johannesburg, S. Africa.

The Telegraph Chronicle

is the only telegraph newspaper published in England. All who wish to know what is going on in the British Postal Telegraph Service and to keep abreast of the progress of technical improvements in telegraphic apparatus and methods, should subscribe to the

TELEGRAPH CHRONICLE.

Published fortnightly at 129 Peppys Road, London, S. E. Subscription, post-free, Five Shillings per Annum. The TELEGRAPH CHRONICLE is the organ of the Postal Telegraph Clerks' Association, the most powerful organization of telegraphers in the world.

JUST OUT.

SMALL ACCUMULATORS. PRICE **50c.**

HOW TO MAKE AND USE THEM.
With Numerous Illustrations.

BY P. MARSHALL.

Mailed postpaid to any address on receipt of price.

J. B. TALTAVAL, Telegraph Age,
253 Broadway, - - - New York

Please mention Telegraph Age when communicating with advertisers.



1 CENT IS ALL IT COSTS to write postal for our big Free Bicycle catalog showing all models at lowest prices. **DO NOT BUY** a bicycle or a pair of tires until you learn our marvellous new offer. We ship on approval without a cent deposit, prepaid freight, allow 10 Days Free Trial—All our new and wonderful propositions with catalogues and much valuable information sent you FREE for the asking. **WE WILL CONVINCE** you that we sell a better bicycle for less money than any other house. Buy direct from the factory. If you want to **Make Money or Earn a Bicycle** write for our Special Offer. **TIRES, Coaster-Brakes, built-up-wheels and all sundries at half usual prices. Do Not Wait, but write us a postal today and learn everything. Write it now.**
MEAD CYCLE CO. Dept. 142, Chicago, Ill.

LEFLEY KEY



The Fastest Telegraph Key in the World.

movement of key knob; the hardened steel knife blade trunnions, which prevent all side motion, combined with the light, springy lever and the flat contact plate, impart to it the qualities of Speed, Ease, Firm and Clear-cut Morse and wearing qualities possessed by no other key on the market.

LEG PATTERN.....\$4.00
LEGLESS "\$4.50

Remit by draft, Post Office or Express Money Order.

S. B. LEFLEY, Columbia, Pa. No. 1, R. F. D.

Telegraph Age.

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

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

TERMS OF SUBSCRIPTION.

One Copy, One Year, - - - - -	\$1.50
One Copy, Six Months, - - - - -	.75
Foreign Countries, - - - - -	2.00

ADDRESS ALL COMMUNICATIONS TO

J. B. TALTAVALL, - Editor and Publisher,
253 BROADWAY, NEW YORK.

E. H. BOWEN, ASSOCIATE EDITOR.
WILLIS H. JONES, ELECTRICAL EDITOR

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

CABLE ADDRESS: "Telogage," New York.
Telephone, 4143—Cortlandt.

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.
REMITTANCES to Telegraph Age should be made invariably by draft on New York, postal or express money order, and never by cash loosely enclosed in an envelope. By the latter method money is liable to be lost, and if so remitted is at the risk of the sender.

NEW YORK, APRIL 1, 1906.

The Book Department of TELEGRAPH AGE, always a prominent and carefully conducted feature of this journal, has, in obedience to continually growing demands made upon it, materially increased its facilities of late. The desire is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished, promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same. These will be of especial aid to buyers inasmuch as they contain brief descriptive references of each volume listed, frequently with full chapter titles.

The reminiscent article, "Looking Backward at Omaha," published in another column, is eloquent of the fact that the telegraph has proved a valuable stepping stone in the lives of hundreds of operators who have graduated from the key into the larger possibilities of life. Of the little band employed at Omaha in the late seventies, it will be observed that a number of them who left the service have since acquired success and large wealth.

Mr. Baker on Earning Promotion.

There is much valuable food for thought for telegraphers, whether at the key or otherwise, in the remarks made by Mr. William H. Baker, vice-president and general manager of the Postal Telegraph-Cable Company, at a recent dinner of Postal employees. He said that it was the policy of his company always to endeavor to fill the higher

positions of whatever grade by promotions from within its own ranks. He urged, therefore, as a matter of self-interest to the individual, that every ambitious employee should earnestly strive to fit himself or herself for advancement in order that they might be ready to go up higher when the opportunity for promotion came. It might be, he said, that possibly the occasion would not offer in the telegraph service, although the telegraph has urgent need of men and women qualified to step up to places of larger responsibility; but if not, then the reward would surely come in avocations outside of the telegraph, for the world has need of workers of ability. In any case, the one thing necessary to secure recognition, whether in the telegraph or out of it, is intelligence and capacity for practical work.

What Mr. Baker has to say takes on a deeper significance from the fact that he himself, like most of the other officials of his company, began life as a messenger and office boy, and consequently knows whereof he speaks.

His are true words, fittingly spoken, and coming from the managing executive of a great telegraph company, whose interest in the welfare of his employees is well known, should carry especial weight and cheer, inspiring courage and ambition on the part not alone of those who heard them, but of all others who gain their livelihood in the service of the Postal company.

It may be remarked in this connection that it is a notorious fact that the telegraph—both the Postal and Western Union companies—are constantly on the lookout for men competent to fill positions of responsibility, more especially those of chief operator, manager and superintendent. There should be men always readily available capable of holding these important places. It will be observed that Mr. Baker, in imparting this sound advice, pursues the same line of thought so frequently expressed in TELEGRAPH AGE. It cannot be adverted to too frequently, for its continual utterance emphasizes a truth so fundamental in character that, acting on its acceptance will direct the individual to the path that leads to success in life. The student and close observer who is fired with the determination to win in life's struggle, need have no fear of the final outcome of his efforts. His ambition will be rewarded sooner or later.

Unightly Telegraph Poles in England.

Small local authorities—and even some of the larger ones—in England, remarks the London Electrical Review, of late have manifested a strong disposition to oppose the erection of telegraph poles, on the ground that overhead wires are unsightly and unnecessary, and that the time has arrived when the postal authorities should put all the wires underground. Needless to say, the powers of the postmaster-general enable him to override such opposition; but the spirit underlying this movement is worthy of notice. The

municipal authorities are obviously ignorant of the heavy cost of placing the wires underground, but in this, as in other cases, their ignorance does not in the least deter them from airing their opinions. It would not matter if they had no power to interfere, but unfortunately they have to be reckoned with in each case, and are able to delay progress—not only in telegraphic work, but also in other directions. It is a pity that there is no means of educating them to appreciate the facts. The daily press, the natural medium for conveying such information, is only too often itself immersed in the mists of ignorance and prejudice.

[It cannot be said that the management of the telegraphs in England, so frequently held up as a model State proposition, meets wholly and always with favor. If criticism occasionally becomes bitter and satirical, whether directed against the administration of the postmaster general, the head of the telegraphs in Great Britain, or municipal authorities, it can scarcely be wondered at in view of shortcomings that, to us on this side of the water, appear to be glaring. It may be remarked that it is a matter of congratulation that our own postmaster general, estimable gentleman though he may be, is not in a position to interfere with and overrule the will of the people. Our English contemporary will perhaps be surprised to learn that the owners of all overhead wires in the United States, in large as well as in small cities, are anxious to place them underground. The necessary expense of so doing does not enter into the calculation, for the benefit to be derived to the service in placing the wires underground is vastly more important in crowded centres than to permit them to remain overhead, always an unsightly spectacle. The wire conditions that prevail in the cities of Great Britain could not exist in this country, at least in this one particular.—Editor.]

Large Gifts to Institute Building Fund.

T. C. Martin, chairman of the land and building fund of the American Institute of Electrical Engineers, announces some large and important contributions to this fund, the object of which is to raise \$200,000 for the land in New York city on which the United Engineering Building, given by Mr. Carnegie, is now being erected. The total cost of the land is \$540,000, and the obligation is divided between the Electrical, Mechanical and Mining Engineers.

Mr. Clarence H. Mackay, president of the Postal Telegraph-Cable Company, has given \$5,000 to the fund. Mr. U. N. Bethell and Mr. J. J. Carty, members of the committee, have advised it, on behalf of the American Telephone and Telegraph Company, the Western Electric Company, the New York and New Jersey Telephone Company and the New York Telephone Company, that these corporations have jointly contributed \$25,000 to the fund, in view of the great benefits that

the existence of this new engineering center will confer upon the electrical arts and upon their employees in the widening field of telephone engineering.

Other notable gifts to the fund are \$1,200 from Mr. E. W. Rice, Jr., and \$500 from Mr. T. D. Lockwood, electrical expert of the American Telephone and Telegraph Company, Boston, Mass., and an old-time telegrapher and author of many telegraph works. A number of subscriptions of lesser amounts have been received from the Institute membership at large, and in this manner the fund has now reached the total of over \$130,000, or two-thirds of the required amount. With the campaign it has already inaugurated, and the plans now maturing, the committee is hopeful of having the entire sum pledged before the Institute moves into its new home. A view of the building and the plan of the committee having its construction in charge, bearing on the relations of the telegraph to the electrical industries in general, appeared in the February 1 issue of "Telegraph Age."

The following correspondence relative to Mr. Clarence H. Mackay's contribution explains itself:

New York, January 31, 1906.

Mr. F. W. Jones,

253 Broadway, New York, N. Y.

Dear Sir:

Replying to your letter of the 15th instant, suggesting a donation by me to the land and building fund being raised by the American Institute of Electrical Engineers, to be applied to the purchase of ground upon which Mr. Carnegie has undertaken to erect an engineering building, and referring to Mr. Guy's letter to you of the 23d instant: I will take pleasure in contributing the sum of \$5,000 to the fund in question, with the understanding that persons engaged in telegraphic business, particularly the employees of the Commercial Cable and Postal telegraph companies, and the members of the regularly organized telegraphers' associations in New York, namely, The Telegraphers' Mutual Benefit Association; The Telegraphers' Aid Society; The Gold and Stock Life Insurance Association, and the Magnetic Club, shall be included among those who are entitled (subject to proper rules and regulations) to avail of the facilities and privileges of the building.

Thanking you for bringing this matter to my attention,
Yours very truly,

Clarence H. Mackay.

New York City, March 15, 1906.

Clarence H. Mackay, Esq.,

President Postal Telegraph-Cable Co.,
253 Broadway, New York City.

Dear Sir:

As chairman of the land and building fund of the American Institute of Electrical Engineers, I have been requested by the committee as a whole to express to you formally and very heartily its thanks for your generous contribution of \$5,000 toward the purchase of the land upon which the United Engineering building is being erected. You will doubtless be glad to hear that with other liberal contributions our fund has now reached a total of \$130,000.

Your letter of gift expresses an interest in the welfare of the telegraphers of the country and the desire that under the proper rules and regulations their organizations in this part of the country shall be permitted to enjoy the facilities of the building. On behalf of the committee, I beg to state that this is exactly the desire and purpose of the committee and of the institute, and that

we hope to see every employee in your service a frequent visitor within the building, enjoying freely all the privileges that Mr. Carnegie, himself an old telegrapher, has enabled us to extend. The administration of the building will be in the hands of the United Engineering Society, representative of the three founder bodies to whom the gift of \$1,000,000 has been made, and it is, of course, with that body that all the scientific, technical and social organizations in our various fields will have to deal when the building is completed and ready for occupancy. I shall be glad, however, myself to make it a personal matter to see that your express wishes are carried out to the fullest degree.

Again thanking you for your handsome gift and felicitating you upon the generous public spirit which has led you to recognize our work and its claims, I have the honor to remain,

Yours truly,

T. C. Martin, Chairman.

Twelve Hundred Thousand Miles of Wire.

The story of the fiftieth anniversary of the Western Union Telegraph Company, told with so much graphic interest in the March 16 issue of TELEGRAPH AGE, has attracted wide attention, eliciting much comment by the press generally, both of the United States and of Canada. The New York "Sun," in its Sunday issue of March 18, had this to say editorially under the title given above:

"Next month the Western Union Telegraph Company will be half a century old. We print the story of its early career, condensed somewhat from an article published in TELEGRAPH AGE, and based mainly on the interesting historical investigations of Mr. A. R. Brewer.

"The vast system now operated by the largest telegraph corporation in the world under the vigorous management of Colonel Clowry is the product of successive consolidations, absorptions of rival concerns, combinations in the direction of monopoly. That this process has been against the public interest we do not think that any candid student of the Western Union's record and present condition will maintain, no matter what are his general views on the subject of corporate aggrandizement. The Western Union has grown with the nation. It has served the people well, it has met intelligently the increasing demands of a progressive civilization, it has steadily reduced the cost of telegraphic communication, and it is to-day one of the finest monuments of American enterprise, energy and private ownership. We invite attention to the circumstance that the owners of the stock in this corporation number ten thousand, or about one owner and capitalist for every three of its thirty thousand employees.

"Congratulations and good wishes are peculiarly due to the Western Union from the newspapers of the United States, for of the printing press the telegraph is the handmaiden."

Legal.

The fourth court of civil appeals in Texas recently rendered a decision in the case of the Houston Rice Milling Company against one of

the telegraph companies. It seems the managers of the milling company sent a cipher telegram to their agent telling him to pay \$3 for rice, as they had reason to suspect the price would fall. The agent had been paying \$3.25 a barrel. The telegram was delivered to a wrong address. The agent of the milling company bought rice all the next day at a price twenty-five cents higher than any other buyers were paying. The loss to the milling company was large, and they brought suit. It was won in the lower court and appealed. The decision was affirmed in the higher court.

A New Standard (?) for Excellence.

A railroad telegraph operator at Adrian, Mich., advertises in a local paper as follows: "I will prepare young men for Postal telegraph service in from six to eight weeks. Salary \$35 a month. It does not require but very little knowledge of the art to hold a position of this kind. Young men prepared for railroad service in three months. Salary \$45 per month and upward. It takes a blockhead two years to learn it. For further particulars address N. M. Rexhart, Adrian, Mich."

We always supposed that the Postal Telegraph-Cable Company's service required the best telegraph timber that could be obtained, and we are surprised to learn that Mr. Rexhart is prepared to turn raw material into the finished product of a postal operator in so limited a period as from six to eight weeks. Postal operators everywhere will doubtless sadly realize that they have wasted much valuable time in acquiring the art they now so skillfully practice, when a man like the advertiser, Rexhart, professes to stand ready to teach all requirements necessary for Postal service within such time limits that will make most operators stand aghast.

Holland Telegraph Statistics.

During the year 1904 the telegraphic system of Holland, according to the reports just issued, was increased by 132.6 kilometers of line and 809.5 of wire, and at December 31, 1904, there were 6,912.9 kilometers of line and 30,412.5 of wire. Of 5,334 interruptions during the year, 18 were due to broken poles, 324 to broken wires, 2,394 to contact and 71 to faults, etc., in sub-fluvial and subterranean cables. Special experiments were made in connection with wireless telegraphy. In 1904 there were 1,187 offices, as against 1,166 in 1903. There were 3,000,483 interior telegrams handled during the year, a decrease of 3.7 per cent. on 1903, and the average number of words per telegram was 14.36. The telephone was largely used in the delivery, etc., of telegrams. One hundred and eleven thousand two hundred and eighty-two telegrams were sent to and from the United States.

The Invention of the Telephone.

Thirty years ago, on March 10, in Boston, the first message ever delivered by telephone was spoken by A. Graham Bell, and heard by his associate, Thomas A. Watson. There was no pompous *mise-en-scène*, such, for example, as Samuel F. B. Morse provided for the delivery of the first message by telegraph; and, indeed, the very lack of publicity and ostentation conspicuous on this occasion was characteristic of the course these two young scientists followed, writes E. F. Harkins in the Boston Transcript.

The scene was the top floor of the boarding-house at 5 Exeter place, an offshoot of Chauncy street. Bell and Watson, associates in the invention of the telephone, had taken rooms in Exeter place nearly a year before, soon after Bell's discovery that the transmission of sounds by electricity was practicable. And it may not be amiss, in view of all sorts of stories still current, to relate the facts concerning that discovery.

In 1874, when Bell was professor of vocal physiology at Boston University, he conceived the idea that two or more Morse dot-and-dash messages could be sent over the telegraph wire at the same time; and consequently he began to experiment with the multiple or harmonic telegraph. Bell's harmonic telegraph was based on the well-known law of sympathetic vibration, which may be illustrated by sounding a note either with the voice or with some musical instrument near the undamped strings of a piano. Thus the string attuned to the pitch of the sound which has been uttered will be sent vibrating, while the other strings remain almost unaffected. If two notes are sounded, then the two strings in corresponding pitch will vibrate, and so on.

Bell, in 1874, went to the shop of Charles Williams, at 109 Court street (now Palace Theatre), to have the apparatus for his harmonic telegraph experiments made and Mr. Williams assigned this task to a young workman named Thomas A. Watson. It was in this way that the two young men became associated. In his experiments Bell used, not piano strings, but pieces of clock spring differing in tune or pitch according to length and thickness. The instrument for receiving the signals was one of the strings clamped at one end to a pole of an electro-magnet, while the free end projected over the other pole, near enough to feel the effect of an electric current passing through the magnet coil, but far enough to vibrate without touching anything. The transmitter was similarly constructed, except that each spring was kept in constant vibration by its electro-magnet, a second screw being so placed that the spring would touch it at every vibration. This furnished a means of interrupting the current a number of times a second, according to the pitch of the spring, and, by tuning and then connecting receivers and transmitters to the line with signaling keys and a battery, as many messages as

there were pitches could be sent simultaneously. Such, in substance, was Bell's harmonic telegraph; and such was the apparatus made by Mr. Watson according to directions given by the inventor.

In the course of their work together, Bell mentioned to Watson that he was convinced that the "telegraphing of speech" was possible, and he explained his theoretical conception of the principles on which the development of the idea would depend—a conception since proved correct, says Mr. Watson, by the fact that the entire development of telephony has been in exact accordance with Bell's original idea. Bell's view was that the transmission of the timbre or quality of any sound, or of articulate speech, could be effected only by some instrument in which the air vibrating under the influence of sound would impress on an electric current analogous vibrations. The electric current necessary for this transmission he called an "undulatory" current, to distinguish it from the intermittent current used in telegraphy. He had no doubt at all of the theoretical possibility of the idea, and, in fact, he showed Mr. Watson a sketch of a complicated instrument which might be useful in the application of the idea; but his confidence that this instrument could be operated practically was not sufficiently great to warrant his risking the rather large sum of money that would be needed for its construction. He had only his income from his professorship, and the experiments in multiple telegraphy, which gave promise of success, were about as heavy a drain as his income could stand.

On the afternoon of June 2, 1875, the two young men were experimenting in the attic rooms over Williams' shop, and the harmonic telegraph was stubbornly resisting their endeavors to make it work satisfactorily. Whether it was the baking heat or just the proverbial perversity of inanimate things they never learned, for all of a sudden came the realization of Bell's idea that the quality of sound could be transmitted by electricity—and the telephone was born.

Bell had been trying to improve the action of the receivers and was retuning one of their springs. To see if the pitch was correct he pressed the spring against his ear and was listening for the faint sound of the intermittent current passing through the magnet—a sound that could always be heard in that way whether the spring was rightly tuned or not. Suddenly the spring of the receiver in Watson's room stopped vibrating, and, to start it, the mechanic snapped it with his finger. At once a great shout came from the other room, and forth burst Bell, inquiring what had been done. "Do it again!" said he, when Watson had explained; and the youth from Williams' shop downstairs spent the rest of the day snapping springs.

What had happened? Just this: The spring which Watson snapped had been permanently magnetized by long use close to its magnet and

was in a condition to generate by vibration Bell's long-dreamed-of undulatory current. When this current passed through the magnet of the receiver pressed against Bell's ear, it caused the spring of the instrument to vibrate, and the fact that this spring was resting against Bell's ear caused it to act as a diaphragm. The expert acoustician instantly perceived that instead of the harsh, nasal scream of the intermittent current—described as something like the noise made by the cicada—he heard not only the pitch but the peculiar soft twang of the spring which Watson had plucked, and, furthermore, he perceived that the current carrying such a sound was what he needed to make practical his preconceived idea of the electric transmission of speech.

"Such an undulatory current had undoubtedly been generated many times before," said Mr. Watson the other day, "but never before had it reached the ear of a man whose mind had been prepared by years of thought and scientific training to perceive instantly what it meant—what it could be made to accomplish in the service of man. The real invention of the telephone was no accident, for it dates from the mental conception by Bell of an undulatory electric current. The plucking of the spring that afternoon might be called an accident, but it had happened before and would probably have happened again. Without the idea in the mind of the man listening to the effect thus produced, however, it would have continued to be regarded as one of the little troubles incident to the development of multiple telegraphy. As it was, Bell's theoretical conviction that such a thing was possible turned the incident into a great pregnant event."

After that, work on the harmonic telegraph gave way to enthusiastic endeavors to develop the telephone. It was but a little step to attach a diaphragm—a tightly stretched piece of drum-head parchment—to the steel spring which Watson had snapped and to devise a mouthpiece for the purpose of concentrating the voice upon it. Thus the spring would be forced to follow the vibrations of the voice, instead of vibrating as before. When these attachments to the harmonic receiver had been made, Bell had his first speaking telephone.

(To be continued.)

Edison's "Haunted" Room Scares Guest.

Mr. Edison is a lover of a good practical joke. When the phonograph was but newly invented the great scientist placed one in the bedroom of a guest. Just as his friend was disrobing a voice exclaimed: "Eleven o'clock—one hour more." Slumber did not descend upon the eyelids of the visitor during that hour. At midnight a second voice cried: "Twelve o'clock—prepare to die." This was too much for the astonished guest, who rushed from his room. Outside he met the inventor, who was convulsed with laughter.

The Telegraphic Typewriter.

BY ROMYN HITCHCOCK.

It is not many years since telegrams were received in New York printed on narrow tape and distributed to customers in that form. This was in the days of the Phelps printer, no longer in use. There were objections to the tape telegrams, for whatever advantages they possessed in legibility over the penmanship of operators were offset by the inconvenience of preserving and filing. However, across the water and particularly in France, the old Hughes printer is still operating and doing most effective work on long lines and cables. It is claimed by the telegraph authorities abroad, that more service can be got from the Hughes printer duplexed than from a quadruplex Morse line, and there is obviously an economy in operation, the messages being automatically printed.

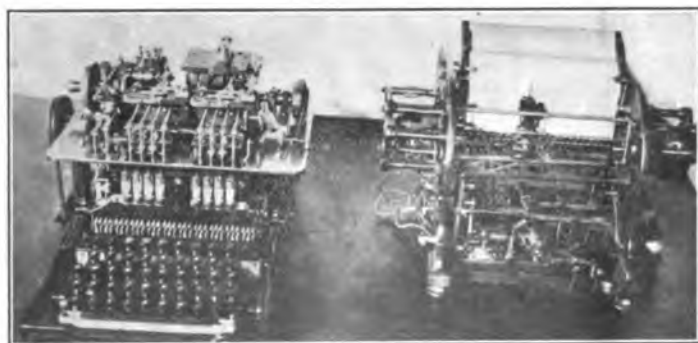
It is said that the Hughes apparatus is capable of sending about forty words a minute. It is not, therefore, a fast-working machine, although considerably more speedy than its stock ticker successors, and it requires special training to operate the keyboard. It depends upon synchronism of transmitter and receiver. This synchronism seems to be easily maintained so long as the operator continues to send regularly, but a momentary interruption throws the instruments out. Consequently Hughes operators are exceptionally industrious during working hours. A single impulse prints a letter, but it must be sent at the right time or it may print some other letter. A printer largely used on French lines is the Baudot, operated from a keyboard which sends, if the writer recollects aright, five impulses for each letter.

While the many advantages of printing telegraphs have thus long been recognized in foreign practice they have been but lightly esteemed in this country, save for stock and news tickers. But recently there has come a remarkable change. The Buckingham printer led the new movement, soon followed by the Blickensferfer-Buckingham-Barclay machine, which now seems to be most in favor. The introduction of these two printers by the Western Union Telegraph Company, has, however, controverted in a most remarkable way a contention which has been long and strenuously maintained by the official and technical staff. This contention was that the preliminary preparation of tape required by high speed systems caused loss of time and was quite impracticable for commercial business. It is now well up to those gentlemen to explain how they can use tape transmission for the comparatively slow printing telegraphs if it is inapplicable to high speed working.

These printers with punched tape transmitters are mentioned here to make clear an important distinction between printers of that kind, intended for use on long lines in the general telegraph service, where speeds of seventy-five to eighty

words a minute can be utilized with automatic sending, and another class of machines operated directly from a typewriter keyboard. The distinction is important not only because of the difference in service, but also for the reason that a printer may work admirably with uniform sending from punched tape, while it might fail under the irregularities of keyboard operating at a slower average speed. For it is not only the average speed that the receiver must respond to in keyboard operating but the highest speed between any two successive letters. Thus it appears that the keyboard printer must have a larger margin of speed over the average than an automatically operated printer.

The great value of a page-printing telegraph which can be operated at typewriter speed from an ordinary typewriter keyboard by any person, for use on private wires, for communication in cities or between offices and warehouses or factories situated in the environs has long been recognized. Many attempts have been made by inventors to produce such a napparatus but all seem to have fallen short of the requirements. Even the simple stock tickers which work at not more than a speed of twenty words a minute, require a two-wire circuit.



THE WRIGHT KEYBOARD TRANSMITTER AND PRINTER

Mr. John E. Wright, well known as a telegrapher and an inventor in connection with tickers and printing telegraphs, has recently perfected, as the culminating achievement of thirty years of experience in this field, a most remarkable keyboard printer.

The transmitter is a separate keyboard machine which any typewritist can operate without previous experience. A number of printers can be operated together on a single wire circuit. The paper used is of ordinary letter paper width. The speed of operating is quite up to commercial requirements. Few operators can write fifty words a minute and those who can are not likely to do it in business communication. The speed limit of the apparatus, however, is considerably above that. Perhaps the best illustration of the speed possibilities is given by the method of testing applied in the assembling shop. The foreman has acquired great skill in writing the word "their" and spacing it across the page. It can

be written and spaced ten times on a line and this is regularly done in eight seconds. This is at a speed of seventy-five words a minute. Adding time for shifting the paper and returning to the beginning of the next line, a speed of seventy words a minute is practicable on the machine. This result is a great achievement. It is so remarkable that there is a fascination in watching the swift-moving type wheel and it seems incredible that it can always present the right letter.

The mechanism is not complex. It is strong and durable. As soon as this apparatus becomes known it will doubtless find many applications. It is especially valued wherever a record is desired at the sending office. It is regularly twice as speedy as ordinary Morse operating, and is believed by its inventor to be well adapted for many important applications in the telegraph service.

The Faith of Prof. Morse.

In a conversation with the late Professor S. F. B. Morse, the inventor of the telegraph, Rev. George H. Hervey asked him this question:

"Professor Morse, when you were making your experiments yonder in your rooms in the university building, did you ever come to a stand, not knowing what to do next?"

"Oh, yes, more than once."

"And at such times, what did you do next?"

"I may answer you in confidence, sir," said the Professor, "but it is a matter of which the public knows nothing. Whenever I could not see my way clearly, I prayed for more light."

"And the light generally came?"

"Yes. And may I tell you that when flattering honors came to me from America and Europe on account of the invention which bears my name, I never felt I deserved them. I had made a valuable application of electricity, not because I was superior to the other men, but solely because God, who meant it for mankind, must reveal it to some one, and was pleased to reveal it to me."

In view of these facts, it is not surprising that the inventor's first message was: "What hath God wrought."

Mr. George W. Conkling, the expert telegraph and Phillips' code operator, states that a peculiar error grown out of the misuse of Phillips code and lack of judgment on the part of the operator, came to his notice recently. The press dispatch should have read: "John Smith was placed under arrest," but instead it read, "John Smith was placed under a railroad." "Urr" is considered by many as good code for "under arrest," but in Phillips code "und" stands for under, and "arr" stands for arrest. Such an error could not have occurred if the strict code rules had been followed.

TELEGRAPH AGE will furnish operators with just the kind of practical information they require.

Looking Backward at Omaha.

BY J. W. HAYES.

It would have been hard to find, outside of New York, as fine a lot of operators and gentlemen as were collected in the Western Union office, Omaha, in the late 70's. The work of the office was of such an expert nature that only the flower of the profession was eligible for service.

Frank Lehmer, the manager, was well liked by the public and popular with his employees and was a good company man. His father, William Lehmer, was receiving and delivery clerk and was a genial disciple of the old school. One of the best operators in the country at that time was Frank B. Knight, who was the day chief. Mr. A. G. Drake was night chief, and, like Edgar B. Beecher, the all night chief, performed his duties to the satisfaction of all. The operating force, as nearly as I remember, was as follows: Willis J. Cook ("Bif"), whom Walter P. Phillips has immortalized in picture and story; Court M. Cunningham, P. J. Tierney, George W. Gardanier, George McMahon, Judd S. Thompson, Levi S. Wild, James H. Largay, Edward J. Fullum, Nicholas C. Burke, George F. Stewart, Clifford E. Mayne, Edward Rosewater, O. H. Gray, Frank P. Williams, Timothy Collins, John Kelly, H. M. Goewey, "Dad" Armstrong, John L. Morris, Harry Nichols, Thomas F. Kehoe, Crosby J. Ryan, Henry Smith and others whose names have passed from my recollection. George Gardner, whose generous nature is of fragrant memory, was our lineman.

The employees at the Atlantic and Pacific telegraph office were: L. M. Rheem, manager; Aaron B. Hilliker, J. W. Ellsworth and Miss Fannie Wheeler, operators; George M. Myers was operator in Superintendent J. J. Dickey's office, and L. H. Kory was Colonel Dickey's chief clerk.

Of the little band of operators that were in Omaha at the time I write of, there is not one remaining in the old capacity. Colonel J. J. Dickey, who was superintendent of the Western Union Telegraph Company at this point for a quarter of a century, died on December 29, 1903. George M. Meyers is now and has been for many years past, one of the leading capitalists engaged in electrical enterprise at Kansas City, Mo. William Lehmer was gathered to his fathers some ten years ago at a ripe age. "Bif" Cook succumbed to the Panama fever fifteen years ago. James H. Largay and T. F. Kehoe died of consumption. H. Milton Goewey was a victim of the dreaded fever scourge in Memphis in '78. Harry Nichols died in the South many years ago.

Frank Lehmer has become a successful banker in Colorado. Frank B. Knight tied up to the telephone service early in its existence and is now abundantly reaping his reward at Dallas, Texas. A. G. Drake is with the Postal Telegraph-Cable Company in Chicago and I hope is doing well. The most unique figure next to "Bif" Cook on the force was Edgar B. Beecher, who was a man

of varied ability and experience. He could turn his hand to anything and his accomplishments came in very handy in his later life. Mr. Beecher is now a prosperous business man in Los Angeles, California. Court M. Cunningham went to New York many years ago and is still there with the Western Union Telegraph Company. Nicholas Burke has been a prominent figure in telegraphic and newspaper circles in various parts of the country. Timothy Collins is a "big policeman" now and does duty in Buffalo. Clifford Mayne became a millionaire, went to California and was lost in the crowd of other millionaires on the Pacific Coast. Frank B. Williams has long been with The Associated Press in Louisville, Ky. Judd S. Thompson is in Washington with the Western Union Telegraph Company. Homer Gray is considerable of a tourist. He was a brainy young fellow and should have made his mark. George McMahon has grown gray in the service of the Western Union Telegraph Company, and is now stationed at Portland, Ore., where he fills the position of chief operator with much credit. John L. Morris is still in telegraphic harness, being located with the Western Union Telegraph Company at San Francisco. P. J. Tierney is also with the Western Union Telegraph Company in New York, and holds a responsible position in the Central Cable office at 16 Broad street, that city. George W. Gardanier rose to be assistant electrical engineer of the Western Union Telegraph Company, but tiring of life, owing to continued ill health, he committed suicide on October 26, 1900. Levi S. Wild is now manager of the Western Union Telegraph Company at Butte, Mont. Edward Rosewater entered journalism, a profession in which he rapidly rose, and is now the proprietor and editor of the Omaha Bee. Crosby J. Ryan is the manager of a branch office of the Western Union Telegraph Company at Detroit, Mich.

Of the Atlantic and Pacific force Mr. Rheem is now a prosperous doctor of Minneapolis. J. W. Ellsworth, who was the youngest brother of George Ellsworth, the celebrated operator, whose handiwork in tapping wires was of great help to the Confederate General Morgan in his invasion of the North during the Civil War, went West and is now ranching somewhere in New Mexico. Miss Fannie M. Wheeler was probably one of the finest lady operators and electricians of her day. She married a Mr. Merryfield, and later returning to the telegraph service, is now in Colorado. Aaron B. Hilliker was one of the greatest characters ever known to the profession. He was a born actor, a minstrel singer, a good newspaper man and a first-class telegraph operator. I don't know his whereabouts, but I hope that prosperity is attending him. L. H. Kory was ever a kind, affable gentleman and a thorough telegraph man. He is now and has for many years been superintendent of telegraph of the Union Pacific Railway, with headquarters at Omaha, Neb.

There was not much to amuse the young man coming from the larger centers in Omaha and after a year's sojourn in the then frontier town on the Missouri, most of the operators whose names I have mentioned took up their line of march toward the golden west, some locating at Cheyenne, some at Salt Lake City and a few going to Virginia City and San Francisco, at which points I will speak of them at another time.

About this time we had at Cheyenne, Wyo., the following force: N. M. Snyder, manager, now deceased; V. DuComb Green, Geo. W. Jones, bearing the sobriquet of "Nip," given him because of his proclivity to nip or clip off his words in key transmission, and W. A. Williams, operators. "Comb" Green holds a responsible position with the Bell Telephone Company in Toledo. "Nip" Jones is a business man of Ogden, Utah, and W. A. Williams is a wealthy citizen of Seattle. Mr. Charles F. Annett, now manager of the Western Union Telegraph Company at New Haven, Conn., was at the time mentioned manager of the Atlantic and Pacific Telegraph Company at Cheyenne.

There was a strong bond of friendship uniting the members of our little community which has lasted these many years and it will be a pleasure, no doubt, for them to read the names of their old colleagues once more in this retrospective glance.

How the Telegraph Operator Surprised the Actor.

O. L. Perry the Fort Wayne manager of the Western Union Telegraph Company for over thirty years, says the Indianapolis News, tells a story of Oliver Doud Byron, the veteran actor, who recently gave a dinner to a party of friends in New York, which reminded Perry of the incident.

"Byron," said Perry, "was playing in Fort Wayne in a piece that called for a telegram informing the operator away ahead of the express train to stop the train, loaded with gold, as bandits were waiting to hold it up. In a dramatic situation Byron as the hero operator at one point clicks the instrument, and there is a strenuous pause to know if the message arrived in time. I was selected to send the message that would tell Byron his warning had been given and the engineer had been notified.

"He knew nothing about telegraphy and what he clicked off had no meaning, of course. At the proper cue I clicked off the words: 'Byron, you may be a good actor, but you are a blame poor operator.'

"There was a tremendous outburst of applause over spots in the audience. It happened that there were a good many railroad men who knew the code in the audience, and when they heard the message they saw the point. It was a good while before Byron could proceed with the play without interruption, and he does not know yet what had caused the commotion."

The Roussel Printing Telegraph System.

The printing telegraph system invented by Willis J. Roussel, of New Orleans, briefly indicated in our issue of February 16, under the heading of Recent Telegraph Patents, is described by Mr. Roussel himself, as a device which consists in providing a transmitter with a keyboard similar to that of a typewriter, each key of which is connected to a rotary disk having contact plates upon the periphery of such lengths and so spaced apart as to indicate in the Morse alphabet the character designated upon the key connected therewith. These contact plates are electrically connected with one wire of the circuit, while a contact roller bears upon the periphery of the disk normally at a non-conducting point, and is electrically connected with the other wire of the circuit. It is therefore obvious that when the disk is revolved by depressing the key, all parts of the periphery will contact with the roller and the proper combination of dots and dashes will be promptly and quickly transmitted to the Morse receiver, where the signals will be printed in the Morse character, as the armature vibrates and the fountain thereon traces the dots and dashes on the tape which is being drawn through the sounder. It must also be said that the same transmitter is so constructed as to be able when desired to operate the typewriting receiver when necessary. This is accomplished by the application of a lever which throws the contact rollers in connection with another set of disks suitably constructed and placed in juxtaposition with the disks used to operate the Morse receiver. With the printing of telegrams in the ordinary letters, the operation is somewhat similar, although requiring a differently constructed receiver. This receiver is built on the principle of a typewriter which prints from a typewheel. The disks, as they are energized by the depression of a key on the transmitter, cause the armature to release the typewheel, and the motor travels the wheel the distances at which the various letters are brought into contact with the platen of the typewriter, and after the printing the letter it is mechanically returned to its original starting point. There is also a mechanism by which the paper is brought into alignment at the end of each line, as well as one for the spacing between the words and the changing of the line when completed. These instruments are combined to work either on a telegraph line or wireless circuit.

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

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

The English Convention of Electrical Engineers.

The various national associations of electrical engineers of the world on invitation of the Institute of Electrical Engineers of England, will meet this year in convention in Great Britain. A sufficient number of these bodies, including the American Institute of Electrical Engineers, have already signified their intention to be present, thus insuring a large attendance. A general reception committee has been appointed, whose headquarters during the convention will be at the Hotel Cecil, Strand, London. The committee is made up as follows:

Chairman, John Gavey, C. B., engineer-in-chief of the English telegraphs; Earl of Crawford and Balcarres, K.T.; Lord Kelvin, O.M., G.C.V.O.; Lord Alverstone, G.C.M.G., Lord Chief Justice; Prof. W. Grylls Adams, F.R.S.; Prof. W. E. Ayrton, F.R.S.; F. Bailey, Prof. W. F. Barrett, F.R.S.; Sir John Wolfe Barry, K.C.B., F.R.S.; T. O. Callender, Albert Campbell, Sir Albert Cappel, K.C. I.E.; Major P. Cardew, R.E.; W. A. Chamen, G. von Chauvin, Col. R. E. Crompton, C.B.; Sir William Crookes, F. R. S.; H. H. Cunynghame, C.B.; S. Dobson, B. Drake, W. Duddle, H. Edmunds, R. S. Erskine, W. B. Esson, S. Evershed, Prof. J. A. Ewing, F.R.S.; A. L. C. Fell. S. C. de Ferranti, Prof. J. A. Fleming, F.R.S.; Prof. G. C. Foster, F.R.S.; E. Garcke, Frank Gill, Dr. R. T. Glazebrook, F.R.S.; Robert Kaye Gray, F. E. Gripper, Robert Hammond, H. E. Harrison, A. W. Heaviside, I.S.O.; J. S. Highfield, Col. R. Hippisley, R.E.; H. Hirst, Col. H. C. L. Holden, R.A., F.R.S.; J. H. Holmes, Dr. E. Hopkinson, Walter Judd, Prof. Gisbert Kapp, Sir Alex. B. W. Kennedy, F.R.S.; J. E. Kingsbury, Sir Oliver Lodge, F.R.S.; P. V. Luke, C.I.E.; Sir Henry Mance, C.I.E.; E. Manville, G. Marconi, LL.D.; T. Mather, F.R.S.; C. H. Merz, W. M. Mordey, A. B. Mountain, Dr. A. Muirhead, F.R.S.; J. M. M. Munro, Hon. C. A. Parsons, C.B., F.R.S.; W. H. Patchell, S. L. Pearce, Sir John Denison Pender, K.C.M.G.; Prof. John Perry, F.R.S.; Sir William Preece, K.C.B., F.R.S.; J. S. Raworth, J. H. Rider, M. F. Roberts, Mark Robinson, Prof. Sir A. Rucker, F.R.S.; R. P. Sellon, P. S. Sheardown, Alexander Siemens, Dane Sinclair, J. F. C. Snell, C. E. Spagnoletti, C. P. Sparks, A. Stroh, Sir J. Wilson Swan, F.R.S.; James Swinburne, A. A. C. Swinton, Herbert Taylor, Prof. S. P. Thompson, F.R.S.; Dr. W. M. Thornton, A. P. Trotter, J. C. Vaudrey, A. J. Walter, C. H. Wordingham, A. Wright.

The following members form the organizing committee:

Chairman, Robert Kaye Gray; J. Gavey, C.B., president; S. Z. de Ferranti, R. Hammond, J. S. Highfield, H. Hirst, Prof. G. Kapp, Sir H. C. Mance, C.I.E.; C. H. Merz, W. M. Mordey, A. B. Mountain, J. M. M. Munro, S. L. Pearce, Sir W. H. Preece, K.C.B., F.R.S.; P. S. Sheardown, A. Siemens, Prof. S. P. Thompson, F.R.S.; Dr. W. M. Thornton, J. C. Vaudrey, A. J. Walter.

A provisional programme has been arranged, of which the following is an outline:

June 23 and 24. Central Committee Rooms at the Hotel Cecil will be open for registration of visitors and members. June 25—Afternoon, a visit to the National Physical Laboratory may be arranged, to attend the ceremony of opening the new Electro-Technical Laboratory. In the evening, reception and banquet at the Hotel Cecil. June 26—Visits to the general post office, power and electric lighting stations, railway and tramway power stations, engineering works, telephone exchanges, and other undertakings and places of interest. In the evening, conversazione at the Natural History Museum. June 27—Excursion up the Thames and visit to Windsor. June 28—Leave London for Birmingham district. The programme will include visits to works in and near Birmingham, including Rugby and Stafford. Arrive Manchester in the evening. June 29—Manchester district: Visits to electricity stations and works in Manchester, Salford and the neighborhood. Conversazione at the Town Hall in the evening. June 30—Proceed to Liverpool. Visits to electricity stations, works and railway. Leave in the afternoon for the Lake District (Windermere). July 1—Excursions in the Lake District. Proceed to Glasgow in the evening. July 2—Glasgow district. Visits to works and reception by Lord Kelvin. July 3—Visits and excursions in the neighborhood of Glasgow. July 4—Leave Glasgow for Edinburgh. In the afternoon leave Edinburgh for Newcastle. July 5—Newcastle district. Visits to works and power station. July 6—Leave Newcastle for Leeds. Visits to works and excursions in the neighborhood of Leeds. July 7—Leave Leeds for London. Entertainment will be provided in London and local centers for the ladies of the party and those of their friends who desire to accompany them.

The Telegraph Tree.

There are many plants which display an ingenuity in gaining food or in attacking their enemies which would seem to indicate a surprising degree of intelligence. Since plants are rooted to their places, they are naturally greatly handicapped, but many of them have surprising compensation. There is, for example, the telegraph plant, of India, which has a method all its own for catching the sunshine. Each of its leaves is composed of three leaflets. The larger terminal one erects itself during the day and turns sharply down at night, while the other two smaller leaflets move constantly, day and night, describing complete circles with a peculiar jerking motion like the second hand of a watch. Occasionally they rest for a period and then go on again, thus bringing every part of every leaf to the full action of the sunlight.

TELEGRAPH AGE should go regularly to every one interested in the telegraph. Write for a sample copy.

"Lifted" His Scalp.

"Please write and tell me how the scalp which old Black Thunder, the Sioux chief, tore off my head forty years ago is getting along," is the contents of a letter which the curator of the Omaha public library has just received from William Thompson, who now lives in Kingston, England, but who lost his scalp to the Sioux Indians and lives to tell of it.

Thompson's scalp has been one of the curiosities of the Omaha public library museum for the last twenty or thirty years, and every year, just after the holidays, Thompson writes to the curator, asking after his scalp.

"I still take a great interest in that little piece of skin and hair," he wrote last year.

Thompson is one of the few men in the world who have been scalped and yet lived to tell of it. And when Thompson left the field on which he was thought to have been slain he brought his scalp away with him, but instead of wearing it on his head it was stuffed in his pocket.

And not only was Thompson scalped once, but on two times did he lose a portion of his brown hair to the Indians—twice within half an hour.

Thompson was a telegraph lineman in the early days of the Union Pacific railroad, and, together with three other linemen, was one day sent out to repair a break somewhere west of Kearney, Neb. This was in the fall of 1866, when the country was full of Indians.

Thompson and his companions went out on a handcar, and when the break was located Thompson climbed to the top of a telegraph pole to repair the broken wire.

His companions went down the road a few poles to make other repairs, and suddenly Thompson heard a rifle shot and an Indian war-whoop. Looking down the road he saw his three fellow linemen pumping for life, the handcar making good speed eastward, while at the foot of the pole on which he was perched stood a grinning Indian brave, with a dozen more to back him up. The surprise had been complete, the Indians crawling up under the cover of the long grass and getting within tomahawk distance before they were discovered.

"Paleface come down," grunted the Indian.

Thompson refused to obey, and without hesitation the Indian at the foot of the pole promptly fired a bullet at his head. The shot took effect and Thompson came tumbling to the ground, where he had the good sense to feign death, although only slightly wounded by the glancing bullet. But the wound in the head fooled the Indian.

Just at this moment Thompson's friends, seeing they had distanced the Indians, brought their handcar to a stop on the top of a distant grade, and as they looked back they saw a tall Indian standing erect, holding high in the air above his head a gory scalp, which he shook at them in a menacing manner.

"I hadn't more than hit ground," said Thomp-

son, relating his experience, "before that big Indian jumped on me, and running a knife around my scalplock, wrapped his fingers in my hair, gave a sudden jerk, and, with a yell, simply tore all the top of my head off. It felt like a red-hot piece of iron placed against my head, but I had sense enough and fortitude enough to keep still.

"I managed to get a look at that Indian, and saw him hang my scalp to his belt.

"But, horrors! A few minutes afterward another Indian came along and took another piece of my hair, although the first one had got the choicest piece.

"There I remained on the ground, playing dead, for an hour or more, while the Indians piled obstructions on the railroad track. Then along came a freight train, ran right into the obstructions, and was wrecked. The Indians killed the train crew and set the box cars on fire. In one car were several barrels of whisky and all the Indians got rip roaring drunk and had a big war dance around the burning train.

"During the dance I saw Black Thunder drop my scalp from his belt, and after nightfall, when there was no light other than from the moon, I put it in my pocket, crawled into the high grass, and, circling around until I struck the railroad track, I 'hit' the trail for all I was worth.

"About daylight the next day I saw a train coming from toward Omaha, I flagged it and found it was a train of soldiers going after the Indians. The linemen had reported my death. They put me on the train and the surgeons got hold of me, tying my head up in all sorts of bandages."

But Thompson had enough of America, and soon afterward he went back to England, taking his scalp along as a memento of his life on the plains.

After he had been away from Nebraska eight or ten years he sent his little scalp back to the Omaha public library, with a letter telling them to keep it as a curiosity.

Preserve Your Papers.

By taking a little trouble, when TELEGRAPH AGE first comes to hand, it may be preserved to form a permanent and valuable addition to the reading matter of a kind which all telegraphers should be supplied. We furnish a neat and attractive cloth board binder, which will be sent by mail, prepaid, for \$1.00. It has good, strong covers, on which the name TELEGRAPH AGE is stamped in gold, and means by which each issue may be securely held as in a bound book. One binder may thus be made serviceable for a number of years, and when successive volumes, as they are completed, are bound in permanent form, the subscriber ultimately finds himself, for a moderate cost, in possession of a most valuable addition to his library, embracing a wide variety of telegraph, electrical and general information.

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

John E. Wright, Expert Telegraph Inventor.

John Edward Wright, the well-known old-time telegraph expert and inventor, a reference to whose printing telegraph system appears in another column, was born in Whitehall, N. Y., October 8, 1848. He moved to Canada when but a child and learned telegraphy at Sherbrooke, on the Grand Trunk Railway, in 1861. Afterwards he worked at Portland, Me., Boston and New York, until the fall of 1864 when he returned to Canada. In 1865 he again went to Boston, remaining there until the winter of 1869-70 in the Western Union employ, filling the position of night manager during the last two years. He then went to New Orleans, returning to New York in 1872 temporarily to the old Atlantic Cable room at 145 Broadway, soon afterwards becoming manager of the New York office of the Automatic Telegraph Company. This was a small experimental company, with one wire between New York and Washington, which



JOHN E. WRIGHT.

had been put up for the purpose of demonstrating the value and practicability of a then new system of chemical automatic telegraphy. Thomas A. Edison was the company's electrician, E. H. Johnson was the superintendent and Patrick B. Delany was the Washington manager, so that if the company's facilities were limited there was no lack of talent behind its efforts. The automatic system proved so efficient that Mr. Edison took it to England in the spring of 1873, Mr. Wright accompanying him as assistant. Mr. Edison returned to New York in a short time, but Mr. Wright remained in England for six years working out various experiments in connection with long cable circuits, the chief result of which was the production of the well-known Brown and Allen relay. Mr. Brown was Mr. Wright's assistant; Mr. Allen was a civil engineer in the same employ as were Wright and Brown. Mr. Wright was in Algeria when the patents

for the relay were filed, hence the name Brown and Allen. In 1878 Mr. Wright returned to the United States and went to work for the New York Associated Press in Washington under the management of Walter P. Phillips, working the leased wire, the first ever rented in this country for press purposes. At the end of a year he was transferred to the New York end of this then famous press circuit and in a short time became assistant to George A. Leech, who was night manager.

The Mutual Union Telegraph Company was organized in 1880 and Mr. Wright was made its electrician. He remained with this company until August, 1882. In March, 1883, he went with The United Press, which was then being reorganized by W. P. Phillips. He remained as manager of the New York office of this concern until 1887 when he went to England and organized its first London bureau.

During the following two years Mr. Wright brought out his first page ticker. The "Column Printing Company" was organized in London to exploit this device and a large number of these tickers were installed in that city, where they are still working most successfully. These were the first page tickers placed commercially before the public. Mr. Wright in 1889 resigned his United Press position and returned to New York, and from that time until the present he has devoted himself entirely to the improvement of this form of printing telegraphs.

In 1889 a company was formed with headquarters at Cleveland, Ohio, for the purpose of putting Mr. Wright's inventions into commercial use. This company has plants running in Chicago, Pittsburg and Milwaukee. The Wright tape ticker is virtually the official ticker of the Chicago Board of Trade. It is also used by the Pittsburg Stock Exchange. A Wright page ticker has been in use since 1893 by the Agence Havas, Paris, France, and has always given reliable and satisfactory service. All these tickers, however, were limited in speed to twenty-two to twenty-five words a minute. Mr. Wright's latest device, which gives veritable typewriting by wire, has moved completely away from the limitations imposed by low speed and difficulty of transmission.

A copy has been received by TELEGRAPH AGE with the compliments of the author, of the printed address of John Gavey, engineer-in-chief of the British telegraph system, recently delivered before the Institution of Electrical Engineers, England, of which body he is president. Voluminous excerpts from this address have already been printed in these columns. The fresh copy now at hand is amplified by a page of curves showing the growth of the telegraph plant maintained by the General Post Office in Great Britain between 1880 and 1905. This shows a most satisfactory increase as well as the mileage of underground wire taken into use during the last three years.

Book Notices.

The "A B C of the Telephone" is a book valuable to all persons interested in this ever-increasing industry. No expense has been spared by the publishers, or pains by the author, in making this the most comprehensive handbook ever brought out relating to the telephone. The volume contains 375 pages, 268 illustrations and diagrams; it is handsomely bound in black vellum cloth, and is a generously good book without reference to cost or price. Orders and remittances (price \$1.00, express prepaid), should be made to J. B. Taltavall, Publisher Telegraph Age, 253 Broadway, New York.

Wireless Telegraphy and Telephony, by Prof. Domenico Mazzotto, translated by S. R. Bottone, is the title of a new work, the object of which is to present to the readers in as simple a form as possible the principles on which the wireless system of signaling is founded, and to describe the apparatus required. It also follows step by step the progress of different inventors who have revised wireless systems, and it traces chronologically the progress made in wireless telegraphy from the first experiments of Marconi at Bologna to the last results of transatlantic wireless signaling. It contains 416 pages and 253 illustrations; price \$2.50, express charges prepaid. Orders should be addressed to J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

"Telegraphy" is the title of a book which gives a detailed exposition of the telegraph system of the British post office, the author being T. E. Herbert, A.M., engineer of the English telegraphs. It embodies a description of the telegraph practice of Great Britain, which is full of interest. Land telegraphy, its systems and apparatus, and the construction of underground lines, are elements of telegraphy alone considered, submarine and wireless telegraphy not being touched upon. To this general consideration of the subject, twenty chapters are devoted, two additional chapters treating respectively of the construction of aerial lines and of the construction of underground lines. Both will be read with special interest. A full description of the Murray automatic system, which has been adopted by the British Government, appears in the appendix, together with much other interesting matter. The comprehensiveness with which the author has handled his theme may be judged when it is said that the volume contains over 900 pages, the illustrations numbering over 500. The price of the book is \$3, including postage. Address all orders for the book to J. B. Taltavall, "Telegraph Age," 253 Broadway, New York.

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

LETTERS FROM OUR CORRESPONDENTS.

[Advertising will be accepted to appear in this department at the rate of five cents a word, estimating nine words to the line, announcements to be enclosed with a border and printed under the name of the place of the advertiser. The special local value attached to advertising of this character will be apparent. Our agents are authorized to solicit advertisements for these columns, and further information on this subject may be obtained on application.]

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 constitute the legitimate contents of all letters. And we wish that our correspondents would avoid the too frequent habit, at all times a bad one, of abbreviating words in writing. This is a peculiarity among telegraphers, we know, but what may be plain to the writer, and for local interpretation, is usually a mystery to the editor, and is apt to lead to error in the printed statement.]

ST. LOUIS, WESTERN UNION.

The telegraphers gave their third informal dance March 17. A musical programme was rendered and refreshments were served.

Mr. M. A. Hawley, Wheatstone chief, has gone to Toledo, Ohio, there to install repeaters for the Barclay printing telegraph system.

"The Telegraph Clerks' Aid Society" reports three members as being disabled—Frank Sassenrath, Stewart Dunbar and Charles Chenot.

J. J. Lane, assistant chief operator, has gone on a vacation for a few months.

Arthur Mitchell, Jr., has left here to work in the Chicago office.

E. Powers, city chief, is absent on a vacation.

PHILADELPHIA, WESTERN UNION.

Arthur Saylor, who had a severe attack of measles, has again returned to duty looking none the worse for his illness.

J. H. Edwards has resigned to take a position with this company in New York.

The Aid Society's progressive euchre, banquet and dance will take place April 18 and not April 8, as has been erroneously stated.

BALTIMORE, WESTERN UNION.

On Sunday morning, March 25, we moved from our temporary quarters in the old Hoen building, to the new office on the ninth floor of the Equitable Building, just six days sooner than was expected. This was due to hard work on the part of the electricians and foreman in charge. No one would have known there was a change of offices, as everything was done so quickly and systematically.

This office is a decided improvement as to location, space and artificial light, and one of the best equipped in the large chain of offices of the Western Union Telegraph Company and the best that has ever existed in Baltimore.

Williard Drake, of the night force, is off for a month to attend to some personal business.

One of the most important bills before the Maryland Senate is the railroad telegraphers' eight-hour bill, which, if passed, will bring joy to every railroad telegraph operator in the state of Maryland.

PHILADELPHIA, POSTAL.

Mr. Leo Miller, who has been absent about ten months on a trip around the world, received a most hearty welcome recently on his return, and is now filling his former position at the Commercial Exchange.

The sympathy of the force is extended to All-Night Manager William J. Poppert and Manager Thomas R. Poppert, of the "Ledger" office, because of the death of their father which occurred March 15. Messrs. Baker, Locke, Redding and Lenahan represented the Postal at the funeral.

That operators, too, are sometimes careless and apparently indifferent about a mother's anxiety was manifested the other day when Mrs. Maurer called on Traffic Chief George Dunn and begged for information concerning her son, R. S. Maurer, who left this office about two years ago, from whom since then she has not heard a word.

Quite on the contrary to the above everybody is invited to rejoice with Robert C. McCredy, of the Commercial Exchange office, who is elated over the fact of having been made a "grandpop."

Owing to the fact of a gratifying increase in business, Manager James Wilson, of the Bourse office, wears a smile of corresponding proportion.

NEW YORK.

WESTERN UNION TELEGRAPH COMPANY

My Motto—Honorable Dealing.

D. A. Mahoney, 253 Broadway, New York. New and remodeled typewriters, all makes. I make a specialty of **factory rebuilt** Remington and Smith machines, from \$35.00 upward. Special representative for the sale of The Mecograph, the most perfect of sending machines. Correspondence invited.

EXECUTIVE OFFICES.

Mr. William Holmes, superintendent of tariffs, accompanied by his daughter, is spending a brief vacation in Florida.

Mr. Theodore P. Cook, of Chicago, general superintendent, accompanied by his private secretary, Mr. M. T. Cook, were in the city last week on business connected with the service.

Mr. Frank Jaynes, general superintendent of the company at San Francisco, Cal., is in the city on a business trip. Mr. Jaynes was accompanied by his wife.

Mr. Jacob Levin, general superintendent of the Southern division of the company, with headquarters at Atlanta, Ga., is also in the city.

Mr. Theodore P. Cook, general superintendent, and L. McKissick, electrician, at Chicago, accompanied by George J. Frankel, superintendent at St. Louis, Mo., have recently finished a tour of inspection through Arkansas and adjoining states with the object of improving the telegraph service which will begin at once at several points.

Mr. T. J. Meade, assistant chief operator at Albany, N. Y., was a recent visitor.

The headquarters of Mr. F. E. Clary, superintendent, will be changed from Hartford, Conn., to New Haven on May 1.

Mr. J. Emerson Lessig has been appointed manager at Pottstown, Pa.

IN THE OPERATING DEPARTMENT.

Mr. C. H. Ward, formerly of the Western Union cable staff at Canso, N. S., has been added to the force at the Central cable office at 16 Broad street.

The following changes have been made in the force here: Mr. C. H. Lawrence from Southern traffic, nights, to the Barclay printing department, days; Mr. J. J. Wilkinson, quadruplex department, nights, to Southern traffic, nights; Mr. F. W. Streeter, Long Island traffic, nights, to quadruplex department, nights.

Mr. J. H. Montgomery, of the New Jersey division, met with an accident recently in the Erie depot on his way home, falling and breaking his arm. He is reported to be improving.

Mr. S. G. Calhoun, formerly operator in this department and later private operator to Mr. Jay Gould, and afterwards with the firm of Washington E. Conner and Company, died at his residence in Brooklyn on March 23. His illness, pneumonia, was of but two days' duration.

On May 1 this company will open a new modern and fully equipped branch office at the corner of Wall and Water streets to take the place of the two branch offices now located in the same vicinity.

OTHER NEW YORK ITEMS.

At the retirement of T. C. Eipper recently, as manager of the Western Union Telegraph Company office at the Produce Exchange, New York, a position he had filled most acceptably for twenty-three years, he was presented by a number of operators and employees of the Exchange with a gold watch, suitably inscribed, the same being tendered as a testimonial of their esteem. Secretary Andrews of the Produce Exchange in behalf of that body also presented Mr. Eipper with a leather album in which was engrossed a letter testifying to his faithful service and courtesy, expressing regret at his leaving and wishing him success. It was signed by over one hundred and fifty firms and members of the Exchange, headed by the president.

Mr. John Brant, secretary of the Old-Time Telegraphers' and Historical Association, is still absent from his office owing to continued illness.

The National Telautograph Company have met with much success in placing their instruments among New York City business firms. The telautograph is employed to connect various departments, similar to the telephone private exchange system, written records are made of communications in a manner better meeting the requirements of business, it is said, than does the telephone.

Assessment No. 447 has been levied by the Telegraphers' Mutual Benefit Association to meet

the claims arising from the deaths of Robert A. Taylor at Terre Haute, Ind.; Edward P. Cauet at Chicago, Ill.; Charles S. H. Small at Passaic, N. J.; John T. Petty at Dallas, Texas, and William J. Byrne at Pittsburg, Pa.

The spring dinner of the Magnetic Club, announced to be held at the Hotel Astor, Broadway and Forty-fourth street, on the evening of Tuesday, April 17, promises to be a fine affair and a numerous attendance is looked for.

THE NEW YORK TELEGRAPHERS' AID SOCIETY ELECTION.

At the annual election of the New York Telegraphers' Aid Society, held on March 27, the following ticket was elected: J. C. Watts, president; H. C. Worthen, vice-president; Thomas M. Brennan, treasurer; C. A. Kilfoyle, financial secretary; W. B. Purcell, recording secretary; Miss S. Dougherty, A. J. Gillman, R. J. Marrin, W. W. Price, Miss M. E. Saunders, M. F. O'Neill, E. F. Howell, G. W. Logan, J. F. Ahearn, W. E. Rath, T. J. Smith, executive committee; J. H. Driscoll, F. D. Murphy, W. T. Rogers, auditing committee.

The annual statement of the New York Telegraphers' Aid Society for the year ended March 6, 1906, and which was presented at the annual meeting, held March 28, is as follows:

Balance on hand March 6, 1905.....	\$18,113.00
Receipts	7,737.81
Total	\$25,850.81
Disbursements	\$6,438.21
Balance on hand March 6, 1906.....	19,412.60
Total	\$25,850.81

RELIEF FUND.

Balance on hand March 6, 1905.....	\$4,497.99
Receipts	751.22
Total	\$5,249.21
Disbursements	\$682.20
Balance on hand March 6, 1906.....	4,567.01
Total	\$5,249.21

BALANCES.

Aid Society..	\$19,412.60	On deposit..	\$23,918.61
Relief Fund..	4,567.01	Cash on hand	61.00

Total\$23,979.61 Total\$23,979.61

J. H. Driscoll, F. D. Murphy, W. T. Rogers, Auditors.

Slight amendments to the constitution were made.

The election of James Clayton Watts as president of the New York Telegraphers' Aid Society advances the vice-president to the head of that organization. This is a deserved recognition, for Mr. Watts is well qualified to assume the higher office, his affiliation for many years with benevolent and insurance associations peculiarly fitting

him to fill the position. Mr. Watts is the all night chief in the quadruplex department of the Western Union Telegraph Company, New York, and is held in high esteem by his associates. He is a Canadian by birth, having been born at St. Stephen, N. B., in 1856. He has been in the



JAMES CLAYTON WATTS.

Who has Been Elected President of the New York Telegraphers' Aid Society.

telegraph service since 1874, and a resident of New York since 1884. His home is in the Bath Beach section, Brooklyn, where with his family, in the house which he owns, he lives the pleasant life of a thoroughly domestic man.

POSTAL TELEGRAPH-CABLE COMPANY.

D. A. Mahoney, 253 Broadway, New York. Typewriters sold and rented. Special representative for sale of The Mecograph; time payments accepted. Correspondence invited.

EXECUTIVE OFFICES.

Mr. G. H. Groce, superintendent of telegraph of the Illinois Central Railroad Company, Chicago, was a recent visitor.

Mr. S. M. English, of Dallas, Tex., general manager of the Postal Telegraph-Cable Company of Texas, was a visitor to the executive offices on March 27. He was accompanied by Judge L. McLaurin, of Dallas, counsel for his company.

Superintendent W. P. S. Hawk, of Salt Lake, Utah, is in Chicago on business connected with the service.

IN THE OPERATING DEPARTMENT.

D. F. Mallen, assistant night manager, has been promoted to be night manager, in place of J. J. Whalen, who has been appointed assistant to F. F. Norton, day manager.

C. J. McCarthy, all-night chief, has been made assistant night manager, and J. B. Rex, Western

day traffic chief, has been assigned to the all-night chiefship.

These changes were the result of the advancement of Manager Charles Shirley to be superintendent in place of G. W. Blanchard, resigned to go into other business.

Joseph Nurnberg, of the service department, has been transferred to the 20 Broad street office, where he has been assigned to similar work.

The resignations include, S. Daig, W. O'Neil, E. C. Bailey, E. Flanigan, Miss C. Holmes, M. La Marsch, M. McDonald, W. W. Dier and T. F. Gallagher, the latter two to go to broker offices.

Business Notice.

Mr. D. A. Mahoney, whose advertisements as a dealer in typewriters have appeared frequently in TELEGRAPH AGE, first at Philadelphia and afterwards in this city, will again take up his former business and makes the announcement under the respective heads of New York Western Union and Postal News. He has been appointed as the special representative of the Mecograph telegraphic transmitter, manufactured by the Mecograph Company of Cleveland. He is prepared to furnish these instruments on a basis of easy payments, and invites correspondence on the subject.

We are in receipt from J. H. Bunnell and Company, Limited, the well-known manufacturers of telegraphic apparatus, of 20 Park place, New York, of one of their double speed telegraph keys which are now being put on the market. This key, together with a beautiful aluminum lever sounder mounted on the same base, has been placed on our desk. The key has double contact points with a sidewise rocking motion and as a consequence requires but one-half the movements of the ordinary key in its manipulation. It may therefore be regarded as a labor-saving device, while at the same time it is said to be by reason of the lateral motion of the lever a preventive of operator's cramp. Two things are certain: First, that the handling of this key can be acquired after a few hours' practice; and, second, the saving in labor of acquiring facility in its manipulation is a most important factor to the individual operator.

Recent New York Visitors.

Mr. Robert L. Dean, president and chief engineer of the Dean Rapid Page Printing Telegraph Company, Kansas City, Mo.

Mr. H. J. Pettingill, vice-president of the Northwestern Telephone Exchange Company, Minneapolis, Minn., and formerly superintendent of the Postal Telegraph-Cable Company at Boston, Mass.

Start your telegraph career right by subscribing for TELEGRAPH AGE.

Quebec, Que.

(Communicated.)

Quebec, from an historical standpoint, is probably the most famous city in Canada. Located on the St. Lawrence River, it is an important shipping point and stopping place for the Atlantic liners. Only a few hours' ride from Montreal, it is reached by three great railways from the south, and will very soon have the advantage of still another great railway, the new transcontinental line—the Grand Trunk Pacific. The site of the city is probably the most picturesque in Canada. The business houses are mostly located in "Lower Town" on the flats and side hills at the foot of the cliffs. On the heights above is situated the residence section and on the plateau behind the city are the famous "Fields of Abraham." The citadel at the very highest point and commanding the St. Lawrence river, is a most important point of interest. Quebec is visited yearly by thousands to enjoy its winter sports, its scenery and the many fishing and hunting resorts nearby. In the center of the business section is the new "Telegraph Building," a three-story stone structure, the home of the Great North-Western Telegraph Company of Canada. Its telegraph facilities are unexcelled—a modern call box plant and direct wires to important Canadian and United States cities, as well as three Atlantic cable stations. From Quebec the Great North-Western Telegraph Company reaches upwards of 49,000 places in Canada, the United States and Mexico.

The North American Telegraph Company.

Organized 1886.

GENERAL OFFICES, MINNEAPOLIS, MINN.

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

CLINTON MORRISON,
President.

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

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

Exclusive direct connection with the telegraph lines of the Minneapolis, St. Paul and Sault Ste. Marie Railway Company.

Municipal Electricians.

The next annual convention of the International Association of Municipal Electricians will meet at New Haven, Conn., on Wednesday, Thursday and Friday, August 15, 16 and 17.

The Commercial Telegraphers' Union, Local 16, will hold its annual smoker and tournament at the Manhattan Lyceum, 66 East Fourth street, New York, on April 20 next. The affair promises to be a great success.

You can't afford to be without TELEGRAPH AGE.

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

An anxious mother desires information concerning her absent son, R. S. Maurer, from whom nothing has been heard for two years. Address Mrs. E. Maurer, 3105 Page street, Philadelphia, Pa.

For Sale—A new Yetman transmitting typewriter; practically has never been used; \$70. W. C. Graves, 210 Girard Trust Building, Philadelphia, Pa.

Wanted—A bright, active young man in one of the best cities in the South for position of first-class clerk; one who has had several years' experience as telegraph operator and general experience in telegraph office; must possess good clerical ability, arithmetical knowledge and be of good character. Reply in own handwriting, stating age, references and where and how employed past five years. Splendid opportunity to one who desires to work and advance. Address, "South," care Telegraph Age.

Rubber Telegraph Key Knobs.

Price fifteen cents, reduced from twenty-five cents. No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. This renders the touch smooth and the manipulation of the key much easier. Remit in one or two-cent stamps and address.

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

TYPEWRITERS New and Second-Hand

On easy monthly payments. Typewriter supplies of all kinds. Renting and repairing a specialty. Send for catalogue and price list.

CENTRAL TYPEWRITER COMPANY

Postal Tel. Bldg., Chicago. 22 E. Mitchell St., Atlanta, Ga.
O. T. Anderson, Pres. - W. L. Gilbert, Manager

THE Canadian Pacific R'y Co's Telegraph

Executive Offices, Montreal
JAS. KENT, Manager

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

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

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

DALLAS, TEXAS.

THE executive offices and the largest telegraph office of the Postal Telegraph-Cable Company of Texas are located in this great commercial center.

Five years ago, when the last census was taken, Dallas had a population of 42,000. It now has 81,273. Five years from now it will have 150,000.

Dallas is a city of substantial realities.

The jobbing trade of Dallas, in 1904, amounted to \$67,000,000.

The foundation of its greatness has been laid on broad, solid lines. Its present rapid development, phenomenal as it is, is not in any sense of the word a boom. It is merely the natural, substantial growth of an intensely practical, progressive city.

It is probable that no other community to-day presents such a favorable opportunity for the conservative investment of capital or intelligent effort as does the city of Dallas.

There is a positive demand for manufacturing establishments of various kinds; for jobbing houses, for public service corporations, and in the country surrounding—the famous black land belt—there are opportunities for farming, for truck gardening, for fruit and berry raising, for chicken and stock raising, unexcelled anywhere in the world.

The Hundred and Fifty Thousand Club of Dallas is an organization of progressive business men pledged to secure for the city a population of 150,000 within the next five years. It has gathered up a great deal of information as to definite opportunities that are now open for the conservative investment of capital and personal energy.

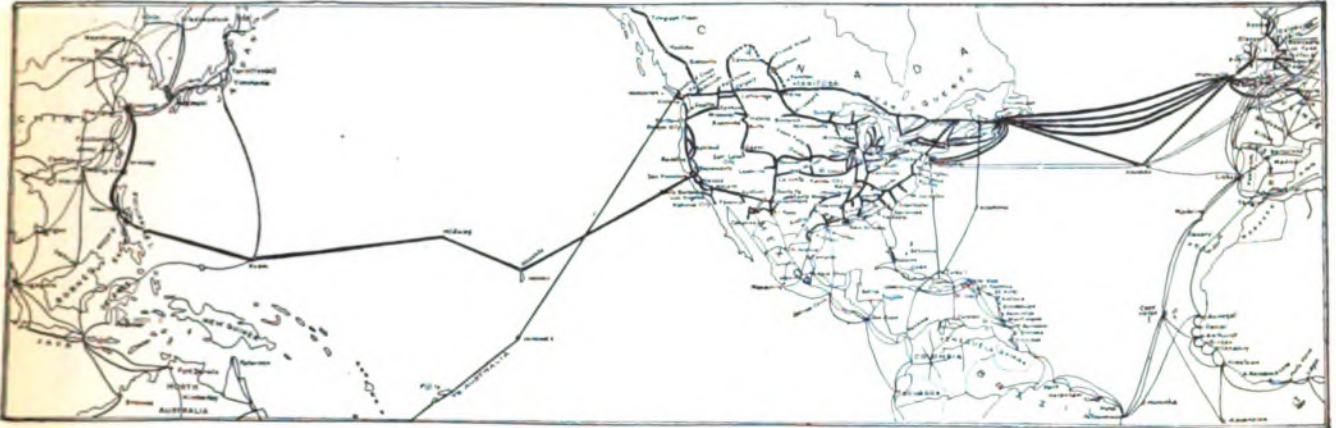
It will be glad to send this information to all who are interested.

Commercial Cable Co.

PACIFIC



ATLANTIC



The Most Extensive Combined Ocean and Land Telegraph System—Over 24,000 Miles of Cable.

— CONNECTIONS —

COMMERCIAL PACIFIC CABLE CO.
CANADIAN PACIFIC RAILWAY TELEGRAPHS
HALIFAX & BERMUDAS CABLE CO.
BRITISH PACIFIC CABLE

POSTAL TELEGRAPH CABLE CO.
DIRECT WEST INDIA CABLE CO.
GERMAN ATLANTIC CABLE CO.
NEWFOUNDLAND CABLE

All Companies and Administrations in Europe.

CLARENCE H. MACKAY, President.

GEORGE G. WARD, Vice-President & General Manager



THE

THE REASONS WHY POSTAL TELEGRAPH-CABLE COMPANY

IS THE

ONLY SUCCESSFUL COMPETITIVE TELEGRAPH SYSTEM EVER MAINTAINED :

Its proprietors and management determined from the first to establish a permanent business based on sound principles and business-like methods, and have steadfastly adhered to that policy.

Its employees are intelligent, diligent, energetic and enthusiastic. They are in sympathy with their employers and are working for the company's interests, recognizing that their interests are identical with the company's interests and that unless the Postal service is the BEST, public patronage cannot be retained.

Every man in the "Postal's" service is proud of the company's success.

These are the reasons why the "Postal" Company has been successful in the past and will be successful in the future.

The progress of the Postal Telegraph System is evidenced by the continued extension of land lines, the numerous and important railroad connections recently made, the valuable connections with the German cables, the Pacific cable, the Direct West Indies cable, the Bermuda cable, etc.

18.75 BUYS \$50.00 DRAPER TYPEWRITER AND 60 DAYS' FREE TRIAL GIVEN

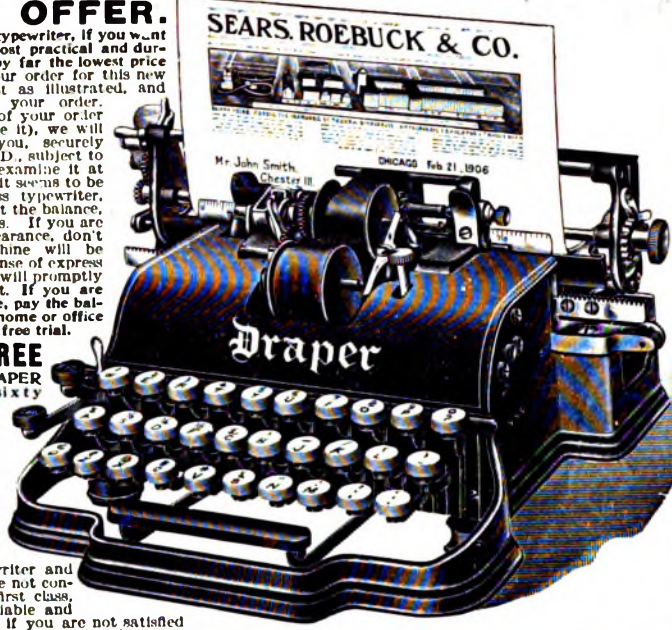
Adapted to every kind of commercial work, suitable for large and small offices, guaranteed by us for ten years and offered on sixty days' trial. Visible writing, has the Universal Keyboard, so that anyone who has learned to operate any standard typewriter can at once operate the DRAPER. Heretofore sold by agents at \$40.00 to \$50.00, a standard machine in successful use for years, never sold to the closest buyers for less than \$35.00, offered by us at the heretofore unheard of price of only \$18.75.

OUR \$1.00 OFFER.

If you have any use for a typewriter, if you want a strictly high grade, a most practical and durable writing machine, at by far the lowest price ever heard of, send us your order for this new DRAPER Typewriter, just as illustrated, and enclose only \$1.00 with your order. Immediately on receipt of your order (the same day we receive it), we will ship the machine to you securely packed, by express, C. O. D., subject to examination. You can examine it at your express office, and if it seems to be satisfactory, a high class typewriter, then pay the express agent the balance, \$17.75 and express charges. If you are not pleased with its appearance, don't pay anything; the machine will be returned to us at our expense of express charges both ways and we will promptly return your \$1.00 deposit. If you are pleased with its appearance, pay the balance, then take it to your home or office for a full SIXTY DAYS' free trial.

SIXTY DAYS' FREE TRIAL.

Use the DRAPER Typewriter sixty days, give it a thorough trial, compare it with any standard typewriter on the market that is sold at three to four times this price, and if you are not thoroughly satisfied with the DRAPER. If you do not find it does any and all kinds of typewriting most satisfactorily, does any work that can be done on any other typewriter and does it as well; if you are not convinced that you have a first class, strictly high grade, reliable and practical writing machine, if you are not satisfied that you have received the most wonderful bargain in a type writer you ever saw or heard of, you will not be under any obligation whatever to keep the machine, but it can be RETURNED TO US AT ANY TIME WITHIN SIXTY DAYS, at our expense of express charges, and we will PROMPTLY RETURN TO YOU YOUR \$18.75, INCLUDING WHAT YOU PAID FOR EXPRESSAGE.



THE DRAPER is the most compact, the most portable of any writing machine in the world. It weighs only 16 pounds and only 22 inches, packed for shipment. The express charges will average about 60 cents for two hundred miles, greater or less distance in proportion; nothing compared to the enormous saving in price. The machine will reach you in the same perfect condition in which it leaves our hands, carefully packed, complete, ready for operation, and we will promptly send you a new machine for any machine that might reach its destination broken or damaged.

WE GUARANTEE SAFE DELIVERY.

OUR FURTHER TEN-YEAR GUARANTEE AGAINST DEFECTS. TO PROTECT YOU FURTHER,

as an additional assurance that we are offering, in the DRAPER, only a strictly high grade, high class, reliable new model, the latest improved visible writing machine, to prove that the DRAPER is made of highest grade materials and finished in the most workmanlike manner; that it is second to none in material and construction, we issue with every DRAPER Typewriter our written, binding ten-year guarantee. By this guarantee we warrant every DRAPER machine free from defects in material or workmanship, AND IF THE DRAPER PROVES DEFECTIVE IN ANY PARTICULAR WITHIN TEN YEARS, WE WILL REPLACE OR REPAIR IT FREE OF CHARGE. It is a leading model and has been Machine is not an experiment in typewriter construction. It has been offered by the manufacturer through agents at prices ranging from \$35.00 to \$50.00, and never, under any circumstances has it been sold in the largest quantities to the closest buyers for less than \$35.00. \$35.00 has heretofore been the lowest price at which anyone in the world could buy this model. We have made a contract with the manufacturer of the DRAPER Typewriter by which we agree to take the largest number of machines ever contracted for by any concern in the world, a quantity that will enable him to so buy the material in such quantities and so increase his product that his manufacturing cost will be greatly reduced. Our price of \$18.75 represents just a little more than the bare cost of the material and labor with only our one small percentage of profit added, just a few cents on each machine, the most wonderful low price ever named on a typewriter, a price no one ever before would suppose would be possible for a strictly high grade, high class, durable, reliable, absolutely perfect new model writing machine.

SPECIAL FEATURES OF THE DRAPER.

SIMPLICITY. The simplest typewriter ever devised. Requires no adjustment, ready to operate the moment you unpack it. Uses the steel type cylinder. All the characters are on one steel type cylinder instead of on independent type bars, and this immediately reduces the number of working parts over the several hundred found in all type bar machines to this one single piece of tool steel. Perfect and permanent alignment. The alignment of the DRAPER is the most perfect ever devised for a writing machine. As all the characters are on the one tool steel cylinder it is impossible for the characters to get out of alignment. Easiest machine to clean. The entire type wheel is only 3 1/2 inches long, the cylinder itself, 1 1/2 inches long and can be removed, cleaned and replaced in a few seconds without danger to the type or alignment.

VISIBLE WRITING. The writing is in sight; a big advantage over the old style blind machines. No stopping and losing time to raise the carriage to see what is written or to look for errors. Wonderful manifolding power. The DRAPER will make more copies and cleaner copies than most of the \$100.00 typewriters.

PORTABILITY. The DRAPER Typewriter is the most portable machine ever produced. The mechanism is so simple, the entire machine is only 6 1/2 inches high, 12 inches wide and weighs only 16 pounds. Has the Universal Keyboard with the double shift key system.

INTERCHANGEABLE TYPE. The style type can be changed in an instant, simply by sliding in another type wheel. We can furnish, at a nominal price, extra type wheels carrying any size or style type in any language.

SEND US YOUR ORDER TODAY. Either send \$1.00 with your order or send the full price, \$18.75; it makes no difference to us. Whether you send only \$1.00, balance payable C. O. D., or the full price with your order, you have all the benefit of our liberal 60 days' free trial and we will return your money and all express charges immediately, at any time within 60 days if you have any reason so feel dissatisfied with the machine. This is the greatest opportunity ever heard of to get a high class, first class, reliable typewriter. No such price was ever before offered. You can order the DRAPER machine from us at \$18.75 and sell it the day you get it for \$30.00. You can get the wonder DRAPER Typewriter and sell five of them at a good profit to your friends, you would undersell every other high grade typewriter on the market, and your friends would be glad of the opportunity of getting a typewriter at a remarkably low price. If you send us orders for three DRAPER Typewriters at our special \$18.75 price you can get this big Morris Chair FREE.

THIS MORRIS CHAIR FREE. As soon as all your orders to us amount to \$50.00 you can get this handsome Morris Chair or your choice of six hardwood, cane seat dining room chairs or a big, full size 6-foot upholstered couch or your choice of other valuable articles.



Please let us send you a DRAPER Typewriter under our guarantee to please and satisfy you or immediately return your money; under our liberal 60 days' free trial plan, and we will send you such a writing machine as you never thought possible for the price, guaranteed for ten years, the most wonderful typewriter value ever offered.

WRITE US FOR THE FREE DRAPER TYPEWRITER CATALOGUE. If you don't send us your order at once (we urge you not to delay for a catalogue) but send your order direct from this advertisement then don't fail to write for a free DRAPER Catalogue, showing large illustrations of the machine, all parts, etc., showing why the DRAPER excels nearly every other high grade machine on the market.

FULL INSTRUCTIONS WITH EACH MACHINE. With every DRAPER Typewriter we send a booklet of plain and simple instructions showing how to operate the machine and how to take care of it. It is the simplest machine in the world; anyone can operate it; very little to learn; nothing complicated or easy to get out of order. Send us your order today, sure. Address,

SEARS, ROEBUCK & CO., CHICAGO, ILL.

Rogers Manifold and Carbon Paper Co.

MANUFACTURING STATIONERS

75 Maiden Lane New York

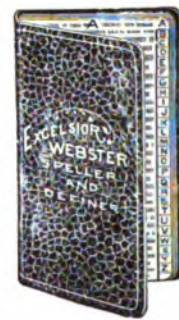
SPECIALTIES

1. Typewriter Carbon.
 2. " " Ribbons.
 3. " " Paper.
 4. " " Oil.
 5. " " Note Books.
 6. " " Tissue Books.
 7. Carbon Paper for Pen use.
 8. " " " Pencil use.
 9. " " " Stylus use.
 10. " " " Train Orders.
 11. Indellible Carbon Paper.
 12. Clean Edge " "
 13. Colored " "
 14. Artists Transfer Carbon Paper.
 15. Carbon Paper in Rolls.
 16. Carbon Paper in Sections.
 17. Stylus with Steel Points.
 18. " " Agate Points.
 19. " " Glass Points.
 20. " " Bone Points.
 21. " " All Agate.
 22. Japanned Tinn.
 23. Press Boards.
 24. Manifold Tissue Books.
 25. " " Paper.
 26. Oiled " "
 27. Wax " "
 28. Parchment " "
 29. Transparent " "
 30. Onion Skin " "
 31. Japanese " "
 32. Foreign Thin " "
 33. Duplicating Letter Books.
 34. " " Order " "
 35. Triplicate Order " "
 36. Printed Manifold " "
 37. Printed Train Order " "
 38. Letter Copying " "
 39. Tissue " "
 40. Manila " Tissue " "
 41. Yellow Message Tissue Paper.
 42. White Message Paper.
 43. Manila Oil Board.
 44. Parchment " "
 45. Counter Check Book.
 46. Hand Stamp Ribbons.
- Etc., Etc., Etc.

Oldest House in the Trade; Established 1869. In sending for Price List mention the Number of the article desired.

Excelsior Webster Pocket Speller and Definer

of the English Language



containing over 25,000 words. This work gives the correct orthography and definition of all the words in common use. The illustration gives a fair idea of the shape of the work being especially made to fit the pocket and bound in a style which makes it durable and elegant. This Speller and Definer is not reprint, but has been carefully prepared by competent hands to meet the general want for a book of this kind, and for the space it occupies has no superior in the publishing world; containing 320 pages, double column,

it weighs 2 1/2 ounces, size 5x2 1/2 inches, bound in elegant American Russia Leather and indexed.

Price 50 Cents, Postpaid

Address **J. B. TALTAVALL**

TELEGRAPH AGE

253 Broadway - NEW YORK

Any electrical or telegraph book

published for sale by Telegraph

Age, 253 Broadway, New York.

TOBACCO TAGS

(PAPER BACKS)

From the following Brands of

PLUG TOBACCO

Are GOOD for PRESENTS

"Horse Shoe"		"Spear Head"	
"Master Workman"	"Old Honesty"	"Pick"	
"Razor"	"J. T."	"Eglantine"	"Ivy"
"Sailor's Pride"	"Jolly Tar"	"Granger Twist"	

Also RED TIN TAGS (Paper Backs) from
 "Tinsley's 16-oz. Natural Leaf"
 and
 W. N. Tinsley's Picture Tags

This Offer Expires, November 30th, 1906

SEND TAGS FOR PRESENTS TO

PREMIUM DEPARTMENT

The American Tobacco Co.

JERSEY CITY, N. J.

SAN FRANCISCO, CAL.

ST. LOUIS, MO.

Not a Case of Hobson's Choice

We offer you a chance for a choice and you can rely upon our advice in buying a typewriter, because we constantly carry in stock **used, shopworn and re-built** typewriters of all recognized makes: Remington, Oliver, Yost, Blickensderfer, Densmore, Hammond, New Century, etc.—we have them all.

We can supply the firm that uses scores of machines and wants them strictly up-to-date, with all latest time-saving conveniences, and fit for the most strenuous usage; also the individual who simply wants a machine that will do nice work for years at a very moderate price.

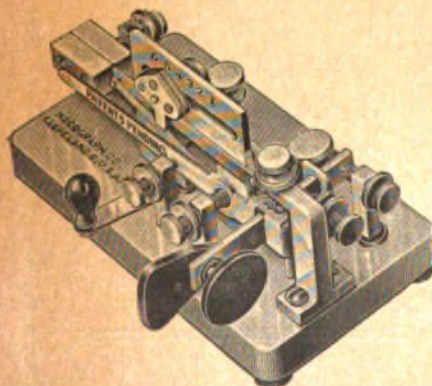
It isn't necessary to pay \$100 for a dependable typewriter. Our prices range from \$20 up.

Write for address of nearest Branch Office, or samples of work and prices. Machines shipped on approval to responsible parties.

*Typewriter Exchange
Department*

**American Writing Machine Co.
343 Broadway, New York, U. S. A.**

MECOGRAPH No. 3



**THE BEST TELEGRAPHIC TRANSMITTER
IN THE WORLD.**

**No winding. No batteries. No rust.
No rattle. No split dots.**

It is a handsome, compact, brass instrument, with adjustments simple and in plain view.

It is easily adjusted to all wire conditions. It works perfectly over the longest and heaviest circuits in the country.

Its sending is even and uniform, and may be made light or heavy at will of operator.

It is in constant use by Press, Broker, Commercial and Railroad Operators and Train Dispatchers.

With it an operator with a bad arm can send seventy or eighty messages an hour more easily than the best operator can send thirty messages in the same time with a Morse key, and can send better Morse.

When ordering state whether brass finish or enamel is preferred. Write for circular.

Price f. o. b. factory \$10.00 cash.
In neat carrying case \$1.00 extra.

MECOGRAPH CO.
74 Frankfort St. CLEVELAND, O., U. S. A.



**THE
6 CHAIRS
FREE**

WRITE US AT ONCE.

FREE TRIAL OFFER

AT HALF PRICE
charged by others, on our **FREE TRIAL PLAN**, on the most liberal terms and payment conditions ever heard of FOR 1906, we offer every style of buggy, carriage and other rigs.

AT OUR EVANSVILLE, IND., BUGGY

FACTORY we are building higher grade buggies than you can buy elsewhere, prices about one-half what others charge; **FREE TRIAL** and payment terms much more liberal than any other house. Special shipping arrangements to all points to make freight charges very low. Enormous stocks on hand to ship the day we receive your order, so you can get any buggy in just a few days after you send us your order, advantages possessed by no other house.

ON A POSTAL CARD OR IN A LETTER to us simply say, "Send me your **Free Buggy Offer**," and you will receive by return mail, postpaid, our latest 1906 Special Buggy Catalogue.

another special catalogue of Wagons, everything in vehicles, our latest catalogue of harness, saddles and saddlery. Price offerings never before heard of; you will receive all our latest and most astonishingly liberal offers.

OUR FREE TRIAL SPECIAL PAYMENT PLAN. You will get such a buggy offer as was never before heard of and you will also receive **OUR SIX CHAIRS FREE OFFER.** If you buy a buggy from us at about one-half what others charge

YOU WILL RECEIVE FREE AS A PRESENT THESE SIX HANDSOME, BEAUTIFULLY FINISHED HARDWOOD, CANE SEATED CHAIRS.



THESE SIX CHAIRS ARE ABSOLUTELY FREE. They cost you nothing, not a penny; this will all be fully explained with all our other offers and catalogues when you write to us. On a postal card or in a letter to us, TODAY, simply say, "Send me your **Free Buggy Offer**," and get all we will send you **FREE** by return mail, postpaid. Address, **SEARS, ROEBUCK & CO., CHICAGO, ILL.**

WISE MEN INSURE THEIR LIVES AND PROPERTY.
 WHY NOT INSURE YOUR SENDING SKILL ABSOLUTELY
 AGAINST DETERIORATION AND PARALYSIS BY USING THE YETMAN

TRANSMITTING TYPEWRITER

(TWO MACHINES IN ONE)

A modern, up-to-date, labor saving, **KEYBOARD SENDING DEVICE**,
 And a completely **VISIBLE-WRITING TYPEWRITER FOR RECEIVING**.

A COMPLETE "KIT OF TOOLS" FOR THE TELEGRAPH OPERATOR

A single touch transmits the Morse signal for every letter and every figure.
 No exhausting physical effort. No nervous strain.

YOU FURNISH THE BRAINS,
 THE TRANSMITTING TYPEWRITER DOES THE REST

Of course you use a Typewriter.

Why not use The Transmitting Typewriter,

And, in SENDING as well as RECEIVING,

Employ your PRESENT KEYBOARD SKILL?



Size (inches), base 11 x 13 1-2, height 11
 (Smaller than an ordinary Typewriter)

All modifications and improvements, so called, on the out-of-date, nerve-destroying hand key, require a special skill for manipulating, and, even under the most favorable circumstances, can afford only a partial or temporary relief.

THE TRANSMITTING TYPEWRITER, with its keyboard touch, gives PERMANENT relief, and enables any intelligent operator quickly to become an expert, and to send absolutely perfect Morse easily and rapidly, with one-tenth the labor.

It is the only mechanism that with a single touch transmits the complete Morse signal for every letter, thus entirely doing away with the constant nervous and muscular strain of hand sending.

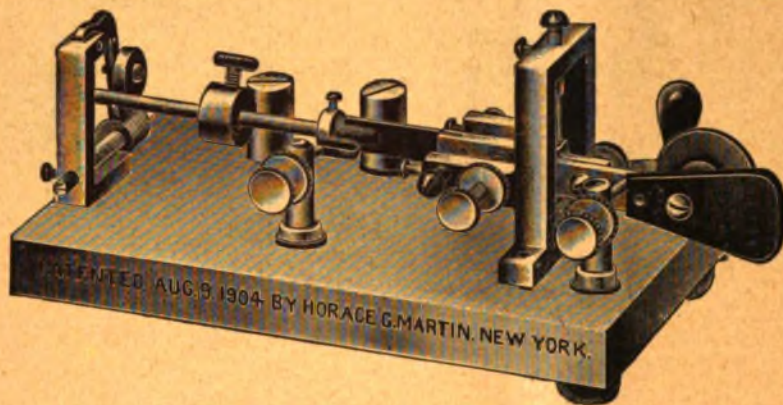
Price only \$125.

Also sold on easy Monthly Payments.
 Special Ribbons at standard prices sent post-paid.
 Write now for Catalog, full particulars and
 convincing testimonials to

Yetman Transmitting Typewriter Co.

ST. PAUL BUILDING - - 220 BROADWAY - - NEW YORK.

MARTIN'S VIBROPLEX The Perfect Transmitter



Operated without a battery; embodies all of the essential features of Martin's famous Auto-plex.

Scientifically constructed, it will carry on the longest of circuits.

Its signals can instantly be made light or heavy, slow or fast.

Its touch is easy and elastic, and adjustable to suit the sender.

IT IS EASY TO LEARN— A PLEASURE TO USE.

If you have lost your grip—
If it tires you to work the Morse key—
If you have a heavy, exacting sending trick—
If you wish to send perfect Morse at any speed,

You Need a
VIBROPLEX
For it makes the dots.

Write for circulars containing description and testimonials.

UNITED ELECTRICAL MANUFACTURING CO., Inc.
53 Vesey Street New York

Official Diagrams of the Postal Telegraph-Cable Company's Apparatus and Rules Governing the Construction and Repair of Lines

We now have ready for delivery a book entitled "Official Diagrams of the Postal Telegraph-Cable Company's Apparatus and Rules Governing the Construction and Repair of Lines." The volume contains 134 pages, including 105 full-page diagrams; size 7 x 4½ inches.

Fourteen pages are devoted to Rules governing the construction and repair of telegraph lines; and four to the subject of standard tools. Submarine cable splices, underground cable splices, single-wire joints and aerial cable splices are also fully treated. Under the general head of Rules for Wiring Offices and Cable Boxes, the subjects of the terminal office, intermediate offices, submarine and underground cables, aerial cables, call circuits and call boxes, leased wire offices, branch offices, miscellaneous, are fully given. Then come rules for the care of motors and generators, explanation of and rules for the care of the Callaud battery, rules for the care of the Leclanche battery and resistance coils, following which is the table of Size and Insulation of Wire Cable for interior use, and that of Wire Gauges.

The authority to publish this fine work by TELEGRAPH AGE, exclusively, was granted by Mr. William H. Baker, vice-president and general manager of the company, the stipulation being that the price shall be restricted to but fifty cents a copy.

This is done primarily in order that the employees of the Postal company may enjoy the benefit of a low charge, for to them the book may be said to be practically indispensable; the price, however, will be the same to all purchasers alike.

This nominal price for so large, important and complete a work, embellished with so many first class plates, made especially for it, makes the book a valuable acquisition to any library; in fact, it is indispensable to every telegraph and electrical student. The book contains diagrams of the Phantoplex system, the latest development in the telegraph art. All of the engravings are made from the official blue-prints of the company, and are therefore absolutely correct.

All orders should be addressed to

J. B. TALTAVALL, Telegraph Age

Remit by Postal or Express money orders.

253 BROADWAY, NEW YORK

....THE....
Western Union Telegraph Co.

EXECUTIVE OFFICES, 195 BROADWAY, NEW YORK

ROBERT C. CLOWRY, President and General Manager

The Largest Telegraph and Cable System in the World

**1,125,549 MILES OF WIRE;
 24,434 OFFICES.**

SEVEN ATLANTIC CABLES

**Connecting North America with all Points
 in Europe and Beyond.**

Including two cables of the American Telegraph and Cable Company, four cables of the Anglo-American Telegraph Company, and one cable of the Direct United States Cable Company.

DIRECT WIRES to GALVESTON, TEXAS, connecting at that place with the Cables of the MEXICAN, the CENTRAL and SOUTH AMERICAN TELEGRAPH COMPANIES for

ALL POINTS IN MEXICO AND CENTRAL AND SOUTH AMERICA,

DIRECT WIRES and CABLES to HAVANA, CUBA, connecting at that place with the CUBA SUBMARINE and WEST INDIA AND PANAMA TELEGRAPH COMPANIES for

ALL POINTS IN THE WEST INDIES.

Domestic and Foreign Money Orders by Telegraph and Cable.

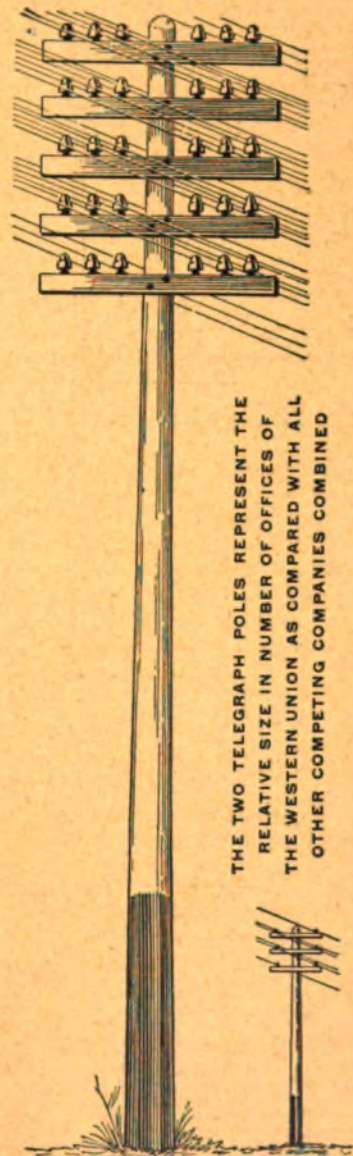
EXCLUSIVE CONNECTION WITH THE
 GREAT NORTH-WESTERN TEL. CO. OF CANADA

OFFICES IN GREAT BRITAIN :

General Offices: **252 Gresham House, Old Broad Street, London, E. C.**

T. W. GOULDING, General Superintendent

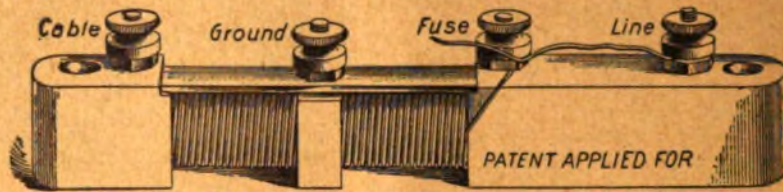
- | | |
|--|---|
| 40 Mark Lane, London, E. C. | Backhall Chambers, Baldwin street, Bristol. |
| 21 Royal Exchange, London, E. C. | 29 Gordon street, Glasgow. |
| Hays' Wharf, Tooley street, London, S. E. | 10 Forster Square, Bradford |
| 109 Fenchurch street, London, E. C. | 1 Panmure street, Dundee |
| The Baltic, St. Mary Axe, London, E. C. | 50 Frederick street, Edinburgh |
| Emmings House, Arundel street, Strand, London, W. C. | Exchange Buildings, Leith |
| 2 Northumberland avenue, London, W. C. | 31 Brown street, Manchester |
| 8 Rumpf street and Cotton Exchange, Liverpool. | 1 Side, Newcastle-on-Tyne |



W. U. T. CO. 24 634 OFFICES OTHER COS. 4,868 OFFICES

THE ARGUS LIGHTNING ARRESTER.

New Principle
New Design
New Results



Always Ready
No Carbons to Clean
No Plates to Adjust
No Ground to Clear
But Ready Just the same for the next Storm.

Lightning of any degree interrupted without grounding or disabling the line. Thousands in use last season. Not one case of loss of Instruments or Cables protected by THE ARGUS ARRESTER.

MADE BY **FOOTE, PIERSON & CO.** Manufacturers of Electrical Goods, 82-84 FULTON ST., NEW YORK.

ATLANTIC INSULATED WIRE & CABLE CO.
WIRES AND CABLES.

FOR SUBMARINE, AERIAL, UNDERGROUND AND INTERIOR USE.

FACTORY STAMFORD, CONN.

120 LIBERTY STREET NEW YORK CITY.

TELEGRAPH, SIGNALS, TELEPHONE, LIGHTING, RAILWAY.

Received Only Medals Awarded World's Fair, Chicago, 1893.

COVERING INSULATED WIRES AND CABLES

FOR Aerial, Underground, Submarine and Interior Use.



KERITE TAPE.

FOR Telephone, Telegraph, Power and Lighting.

W. R. BRIXEY, MANUFACTURER.

203 BROADWAY, NEW YORK.

MANUFACTURED AT SEYMOUR, CONN.

Catalogues, Samples and Prices on Application.

AMERICAN TELEGRAPHY:

SYSTEMS, APPARATUS OPERATION

500 Diagrams, 665 Pages, 34 Chapters.

By **WILLIAM MAVER, Jr.**

Bound in Cloth, - - - \$5.00

Sent, express charges prepaid, to any part of the world upon receipt of price.

J. B. TALTAVALL,

Telegraph Age,

253 Broadway, New York.

Please mention Telegraph Age in communicating with advertisers.

THE WESTON STANDARD VOLTMETERS AND AMMETERS.



The Weston Standard Mill-Ammeters and Ammeters are infinitely superior to galvanometers for tests of current strength on lines and for tests of Relays, Sounders and other Telegraphic Apparatus. They are direct-reading, dead-beat, and are practically uninfluenced by the earth's field. No constants are required, and with careful use there is no necessity for recalibration. The Weston Standard Voltmeters are the very best practical instruments obtainable for determining the electro-motive force of single cells, or series of cells, or for ascertaining the voltage on lines. By the proper use of these instruments all tests of resistance, current, strength and electro-motive force required in telegraphic practice can be made with great ease and accuracy. Correspondence solicited.

WESTON ELECTRICAL INSTRUMENT COMPANY,

Main Office and Works: **WAVERLY PARK, NEWARK, N. J.**

LONDON BRANCH: **Andrey House, Ely Place, Holburn.**

PARIS, FRANCE: **E. H. Cadot, 12 Rue St. Georges.**

BERLIN: **European Weston Electrical Instrument Co., Ritterstrasse No. 88.**

NEW YORK OFFICE: **74 Cortlandt Street.**

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

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, Telegraph Age, 253 Broadway, New York.

TELEGRAPH AGE

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

Office of Publication: 253 BROADWAY, NEW YORK

ESTABLISHED
1883

Single Copies 10 Cents } \$1.50 per Year
2.00 to Foreign Countries

VOL. XXIV., No. 8.

NEW YORK, APRIL 16, 1906.

Whole No. 550.

ELECTRICAL SUPPLIES AND SPECIALTIES
FOR
TELEGRAPH AND SIGNAL WORK
General Sales Agents for OKONITE WIRE.



Central Electric Company,

264-266-268-270
FIFTH AVENUE,
CHICAGO.



1889

PARIS EXPOSITION MEDAL FOR
RUBBER INSULATION.



1893

WORLD'S FAIR MEDAL FOR
RUBBER INSULATION

THE STANDARD FOR RUBBER INSULATION.

SOLE MANUFACTURERS OF Okonite Wires, Okonite Tape, Manson Tape, Candee Weatherproof Wires

THE OKONITE CO., LTD., 253 BROADWAY, NEW YORK.

WILLARD L. CANDEE,
E. DURANT CHEEVER, } Managers.

WRITE FOR PRICES.

GEO. T. MANSON, Gen'l Supt.
W. H. HODGINS, Secy.

The Remington Typewriter

is *the* telegrapher's machine—so recognized by telegraph operators everywhere. The majority of all machine operators the country over use the Remington.

The reason is as plain as the fact itself. The Remington is the swiftest, the Remington is the most durable and reliable of all writing machines—and these are the qualities in a typewriter which the telegraph operator demands.



Remington Typewriter Company

325-327 Broadway, New York

BRANCHES EVERYWHERE

IN CORRESPONDING WITH ADVERTISERS PLEASE MENTION THIS PUBLICATION.

Not a Case of Hobson's Choice

We offer you a chance for a choice and you can rely upon our advice in buying a typewriter, because we constantly carry in stock **used, shopworn and re-built** typewriters of all recognized makes: Remington, Oliver, Yost, Blickensderfer, Densmore, Hammond, New Century, etc.—we have them all.

We can supply the firm that uses scores of machines and wants them strictly up-to-date, with all latest time-saving conveniences, and fit for the most strenuous usage; also the individual who simply wants a machine that will do nice work for years at a very moderate price.

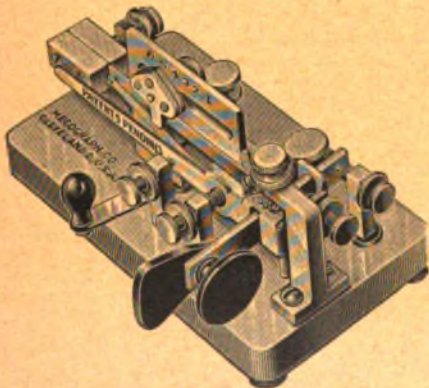
It isn't necessary to pay \$100 for a dependable typewriter. Our prices range from \$20 up.

Write for address of nearest Branch Office, or samples of work and prices. Machines shipped on approval to responsible parties.

*Typewriter Exchange
Department*

**American Writing Machine Co.
343 Broadway, New York, U. S. A.**

MECOGRAPH No. 3



**THE BEST TELEGRAPHIC TRANSMITTER
IN THE WORLD.**

**No winding. No batteries. No rust.
No rattle. No split dots.**

It is a handsome, compact, brass instrument, with adjustments simple and in plain view.

It is easily adjusted to all wire conditions. It works perfectly over the longest and heaviest circuits in the country.

Its sending is even and uniform, and may be made light or heavy at will of operator.

It is in constant use by Press, Broker, Commercial and Railroad Operators and Train Dispatchers.

With it an operator with a bad arm can send seventy or eighty messages an hour more easily than the best operator can send thirty messages in the same time with a Morse key, and can send better Morse.

When ordering state whether brass finish or enamel is preferred. Write for circular.

Price f. o. b. factory \$10.00 cash.
In neat carrying case \$1.00 extra.

MECOGRAPH CO.
74 Frankfort St., CLEVELAND, O., U. S. A.

i. j. est.
neatjaen nc



**THE
6 CHAIRS
FREE**

WRITE US AT ONCE.

FREE TRIAL OFFER

AT HALF PRICE

charged by others, on our **FREE TRIAL PLAN**, on the most liberal terms and payment conditions ever heard of FOR 1906, we offer every style of buggy, carriage and other rigs.

AT OUR EVANSVILLE, IND., BUGGY FACTORY

we are building higher grade buggies than you can buy elsewhere, prices about one-half what others charge; **FREE TRIAL** and payment terms much more liberal than any other house. Special shipping arrangements to all points to make freight charges very low. Enormous stocks on hand to ship the day we receive your order, so you can get any Buggy in just a few days after you send us your order, advantages possessed by no other house.

ON A POSTAL CARD OR IN A LETTER to us simply say, "Send me your Free Buggy Offer," and you will receive by return mail, postpaid, our latest 1906 Special Buggy Catalogue.

another special catalogue of Wagons, everything in vehicles, our latest catalogue of harness, saddles and saddlery. Price offerings never before heard of, you will receive all our latest and most astonishingly liberal offers.

OUR FREE TRIAL SPECIAL PAYMENT PLAN. You will get such a Buggy offer as was never before heard of and you will also receive **OUR SIX CHAIRS FREE OFFER.** If you buy a buggy from us at about one-half what others charge

YOU WILL RECEIVE FREE AS A PRESENT THESE SIX HANDSOME, BEAUTIFULLY FINISHED HARDWOOD, CANE SEATED CHAIRS.



THESE SIX CHAIRS ARE ABSOLUTELY FREE. They cost you nothing, not a penny; this will all be fully explained with all our other offers and catalogues when you write to us. On a postal card or in a letter to us, **TODAY**, simply say, "Send me your Free Buggy Offer," and get all we will send you **FREE** by return mail, postpaid. Address: **SEARS, ROEBUCK & CO., CHICAGO, ILL.**

Commercial Cable Co.

PACIFIC



ATLANTIC



The Most Extensive Combined Ocean and Land Telegraph System—Over 24,000 Miles of Cable.

— CONNECTIONS —

COMMERCIAL PACIFIC CABLE CO.
CANADIAN PACIFIC RAILWAY TELEGRAPHS
HALIFAX & BERMUDAS CABLE CO.
BRITISH PACIFIC CABLE

POSTAL TELEGRAPH-CABLE CO.
DIRECT WEST INDIA CABLE CO.
GERMAN ATLANTIC CABLE CO.
NEWFOUNDLAND CABLE

All Companies and Administrations in Europe.

CLARENCE H. MACKAY, President.

GEORGE G. WARD, Vice-President & General Manager.



THE REASONS WHY THE POSTAL TELEGRAPH-CABLE COMPANY

IS THE

ONLY SUCCESSFUL COMPETITIVE TELEGRAPH SYSTEM EVER MAINTAINED :

Its proprietors and management determined from the first to establish a permanent business based on sound principles and business-like methods, and have steadfastly adhered to that policy.

Its employees are intelligent, diligent, energetic and enthusiastic. They are in sympathy with their employers and are working for the company's interests, recognizing that their interests are identical with the company's interests and that unless the Postal service is the BEST, public patronage cannot be retained.

Every man in the "Postal's" service is proud of the company's success.

These are the reasons why the "Postal" Company has been successful in the past and will be successful in the future.

The progress of the Postal Telegraph System is evidenced by the continued extension of land lines, the numerous and important railroad connections recently made, the valuable connections with the German cables, the Pacific cable, the Direct West Indies cable, the Bermuda cable, etc.



The HAMMOND TYPEWRITER

BEST :: ADAPTED :: FOR :: TELEGRAPH :: OPERATORS

SPECIAL FEATURES:

Work in Sight Perfect Alignment
 Any Width of Paper Automatic Impression
 Interchangeable Type Swift and True
 Excels in Beauty of Work and Durability

THE HAMMOND TYPEWRITER COMPANY

Factory and General Offices: 69th to 70th Street & East River New York, N. Y.

JOHN A. ROEBLING'S SONS' CO.

OF NEW YORK

MANUFACTURERS OF

IRON, STEEL
AND COPPER

Telegraph Wires

UNDERGROUND AND SUBMARINE CABLES.
INSULATED WIRES.

WORKS

Trenton, N. J.

NEW YORK OFFICE

117, 119 and 121 Liberty St.



I CURED MY RUPTURE

I Will Show You How To Cure Yours
FREE.

I was helpless and bed-ridden for years from a double rupture. No truss could hold. Doctors said I would die if not operated on. I fooled them all and cured myself by a simple discovery. I will send the cure free by mail if you write for it. It cured me and has since cured thousands. It will cure you. Write to-day. Capt. W. A. Collings, Box 893 Watertown, N. Y.

THE PHILLIPS CODE.

PRICE, \$1.00.

A thoroughly tested method of Shorthand, arranged for Telegraphic Purposes and contemplating the rapid transmission of press reports, also intended to be used as an easily acquired method for General Newspaper and Court Reporting.

Address,

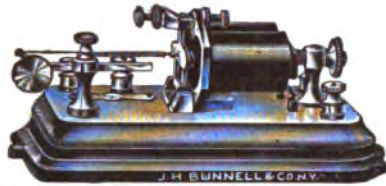
J. B. TALTAVALL,

TELEGRAPH AGE, 263 BROADWAY
NEW YORK.

THE NAME

"BUNNELL"

on Telegraph or other Electrical Apparatus is positive Assurance that it is the BEST



The Finest Relay Ever Constructed.

Condemned by every operator at first glance, but on reflection this judgment is quickly reversed, and a trial or demonstration of the Double Speed Key creates enthusiasm, and free predictions that this is the

COMING KEY.

SEND FOR CIRCULAR

J. H. BUNNELL & CO.

MANUFACTURERS, IMPORTERS AND DEALERS IN TELEGRAPH, TELEPHONE, RAILWAY AND ELECTRIC LIGHTING SUPPLIES, INSTRUMENTS, BATTERIES, INSULATED WIRES and LINE EQUIPMENT

THE DOUBLE SPEED TELEGRAPH KEY.



PATENTED



Requires but one-half the motions of the ordinary key, and these are made by a side-wise rocking motion of the hand, easily acquired, which guarantees that operators will not be affected with cramp, and those who are so affected will soon recover their

Speed and Style

LEG PATTERN, - \$4.00

LEGLESS PATTERN, - \$4.50

PORTABLE PATTERN, with wedge and cord for connection with ordinary key, 6.50

20 Park Place, New York,
P. O. Box 1286.

MARSHALL'S ELECTRICAL CONDENSERS



STANDARD SERIES STANDARD CONDENSER
STANDARD CONDENSERS A SPECIALTY.
Condensers for Telegraph, Telephone, Electric Light and Experimental purposes.
These condensers are used in all telegraph offices in America where standard and ordinary condensers are required. Send for catalogue. Address W.M. MARSHALL, 709 Lexington Ave., nr. 57th St., New York

HUDSON'S WORD REGISTER



A simple, accurate device for counting the words written upon the typewriter. It is easily read, instantly set, and covers both message and special work. Price by mail, with full directions for attaching and operating, \$3.00. State what machine you use. Circular free. Address

GEO. E. HUDSON,
Sheridanville, Pa.

TRY THIS BICYCLE 10 DAYS FREE



WE WILL SEND YOU THIS BICYCLE to ride ten days FREE, and if you don't say it is the easiest running, highest grade, strongest, handsomest, most graceful, comfortable and easy riding bicycle you ever saw, the ten days' trial won't cost you one cent. Our FREE Bicycle Catalogue shows this great genuine ten days' free trial offer. \$11.75 BUYS OUR NEW 1906 MODEL KENWOOD, the long famous \$75.00 bicycle, strictly high grade, worth three of the bicycles sold by others at \$15.00 to \$25.00, a wonderful model, guaranteed for two years and offered on ten days' free trial, all fully illustrated and described in our new Free Special Bicycle Catalogue. In our Free Bicycle Catalogue we show our entire line of beautiful new 1906 model bicycles for men, women, boys and girls, the finest wheels ever put on the market, and our low prices, liberal terms, guarantees, free trial plan, offers, induce the FREE Bicycle Catalogue.

ments and privileges will surprise you. Write at once for

THIS SILVERWARE SET FREE

YOU CAN GET THIS HANDSOME INITIAL SILVERWARE SET (any initial engraved and complete in leatherette case) FREE if you buy from us or take orders for a few bicycles; or you can get your choice of a gun, camera, watch, clock, suit of clothes or many other valuable articles given FREE for sending us your orders. This astonishing offer is also shown in our Free Bicycle Catalogue. Write us a letter or postal note now and say: "Send me your Free Bicycle Catalogue," and the big book with handsome pictures of all our new bicycles, showing every piece and part, why our bicycles are the highest grade bicycles made in the world, the wonderful construction which makes them so easy running, so strong and durable, why we can make such wonderfully low prices, such liberal terms, such remarkable offers, such broad guarantees, the free silverware offer, our other offers of valuable articles free, everything will be sent to you at once by return mail, FREE and postpaid. DON'T FAIL TO GET OUR NEW 1906 BICYCLE PROPOSITION; it's a marvelous offer. Write this minute. Address



SEARS, ROEBUCK & CO., CHICAGO, ILLINOIS.

THE PHILLIPS CODE.

PRICE, \$1.00

A thoroughly tested method of Shorthand, arranged for Telegraphic Purposes and contemplating the rapid transmission of press reports, also intended to be used as an easily acquired method for General Newspaper and Court Reporting.

Address,

J. B. TALTAVALL,

Telegraph Age, 253 Broadway, New York

Standard Underground Cable Co.



Wires, Cables, Accessories.

RAILWAY, ELECTRIC LIGHT, TELEPHONE, TELEGRAPH. For Aerial, Underground and Submarine Use.

NEW YORK PHILADELPHIA CHICAGO PITTSBURGH
BOSTON SAN FRANCISCO ST. LOUIS

TELEGRAPH AGE

No. 8.

NEW YORK, APRIL 16, 1906.

VOL. XXIV.

CONTENTS.

Some Points on Electricity. The Storage Battery.....	163
Recent Telegraph Patents. Business Notices	164
Personal Mention. Western Union. Executive Offices; Postal Telegraph. Executive Offices. The Cable	165
Resignations and Appointments. Obituary	166
General Mention. The Railroads. Wireless Telegraphy.....	167
Municipal Electricians	168
The Invention of the Telephone	169
What are Atoms, Electrons and Ions	170
A Boston Telegraphic Tournament. The Invention of Printing Telegraph Systems	171
Tattling Operators. Underground Telegraph Wires.....	172
The Safer Ways of Crime	173
Dr. E. M. Rhoads Indulges in Reminiscence.....	174
The Telharmonium	175
Looking Backward at Salt Lake City	176
International Telegraph Tournament at Boston. A Growing Evil	177
Wire Ordinance in Minneapolis. The Chicago and Milwaukee Telegraph Company. An Unsatisfactory Earth Current.....	178
Messenger Boy Law. The Operator and the Adobe Collision. Government Telegraph Line Will be Sold	179
Perfect Phillips Code. Iron Wires Being Substituted for Copper The New Vice-President of the New York Telegraphers' Aid So- ciety. San Francisco. Postal; Philadelphia. Postal.....	180
Philadelphia. Western Union; Chicago. Western Union; Montreal. Great North Western; Cincinnati. Western Union; St. Louis. Western Union; New York. Western Union.....	182
New York. Postal	183
Book Notices. Canadian Pacific Telegraph Increases its Facilities. Interesting Telephone Figures	184
The Telegrapher's Despair	185
Telegraph Notes from Unknown Europe	186

SOME POINTS ON ELECTRICITY.

The Storage Battery.

Part III.

BY WILLIS H. JONES.

In charging or recharging a storage battery the connections must be made in such a manner that the polarity of the cell's electromotive force will oppose that of the charging current; that is to say, the positive electrode of the cell must be connected to the same or positive polarity of the charging main lead. Otherwise it would be in a position to give out current instead of accumulating electric energy in case it was not entirely exhausted.

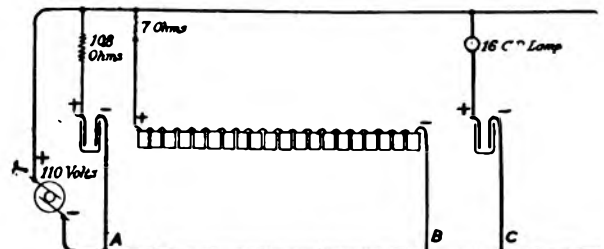
The charging electromotive force, of course, must be of a greater value than that of the cell, or series of cells, as the case may be, receiving current in order to overcome the electromotive force of the latter and force the excess of its energy through the storage battery.

As there is practically no internal resistance in the cell itself and but little in the office wires connecting the storage battery with the charging source, it evidently requires but a few volts in excess of the battery's back pressure of two volts per cell to do the work. Hence a low pressure is most economical for the purpose. Unfortunately, however, low voltage charging currents are not always available, and advantage must

be taken of such facilities as happen to be offered.

Usually the one hundred and ten-volt pressure of some electric light source is made use of for charging purposes. In this case it is first necessary to reduce the excessive pressure either by means of artificial resistance inserted in the charging leads or by connecting a sufficient number of cells together in series while receiving current to reduce the value of the charging electromotive force by means of the back pressure, two volts per cell, of the storage battery. The point to remember is that every unnecessary ohm of artificial resistance inserted in the charging circuit consumes a portion of energy uselessly, but which must be paid for just the same as if it was consumed in charging the battery.

To make this point clear to the reader, let us suppose that we wish to charge, first, one cell of battery at the rate of ten amperes current per hour from a one-hundred-and-ten-volt electric



light source. As the back pressure of the storage cell will reduce this pressure to one hundred and eight volts effective, it will require the insertion of 10.8 ohms artificial resistance in the lead. According to Ohm's law, $E \times C = W$, we find that the electrical energy expended in charging the cell at the rate of ten amperes per hour will be $10 \times 10.8 = 108$ watt-hours.

If we had reduced the charging pressure by means of the back pressure of several storage cells connected together in series, as shown in B in the diagram, the cost would have been greatly reduced. Thus twenty cells joined in series would reduce the one-hundred-and-ten-volt pressure to seventy volts effective. The insertion of but seven ohms artificial resistance would then be required to draw a charging current of ten amperes. The electric energy per hour thus expended in charging the entire twenty cells would then be but seventy watts, whereas one cell alone, arranged as in the illustration, would demand a one hundred and eight watt-hour rate.

The lesson to be learned from this is that every possible effort should be made to arrange a charging circuit in such a manner that the least amount of artificial resistance permissible shall be required to create the desired value of charging current. In each of the charging methods just described, the energy is, of course, bought outright, and whether employed usefully or otherwise the value of the amount taken represents the expense of charging the battery. It is possible, however, to charge storage batteries for practically nothing, or, to speak more accurately, without additional office expense. This is accomplished by utilizing electric currents originally arranged for and employed usefully doing other work, but which are harnessed and compelled to perform double service without extra compensation therefor. Thus a small cell of storage battery connected in series with one sixteen candle-power lamp, as shown at C in the diagram, may be charged at the rate of one half an ampere of current per hour, not only without additional expense, but the operation will actually reduce the office expense slightly for electric lights! Of course, it is assumed that the cell will only be connected for charging purposes during the period the lamp would otherwise be actually required in its legitimate capacity of furnishing light. The explanation lies in the fact that the back pressure of the storage cell reduces the current slightly in the lamp circuit but not sufficiently to cause a very noticeable decrease in the lamp's illuminating power.

The total amount of current and electric energy which that particular lamp and battery circuit will draw under these conditions must obviously be something less than that of the normal intake of forty-eight watts, owing to the two-volt reduction in the effective pressure. This reduction, of course, means a slightly reduced cash expense for maintaining that lamp, despite the fact that the current is doing double duty, but the slight monetary gain is offset by a proportional loss in the way of illumination. The latter loss, however, is so small that the diminution is barely noticeable.

For hotels, ticket offices, and other small branch telegraph stations using but one or two sounders, a small storage battery charged all night by this method would receive probably five or six amperes of current, as the strength of the current flowing through a sixteen candle-power incandescent lamp is just a little more than one-half ampere in volume. The cell would thus fill at the rate of one-half ampere per hour.

As the four-ohm sounders usually employed in connection with relays require but one-quarter of an ampere each, two such sounders could be fully energized for the same number of hours that was allowed in charging, even should the local circuits be closed during the entire period. When sounders are in operation, however, the local circuit is, of course, "open" about half the time, so that in reality the volume of current actually

used during, say, one hour, would be one-eighth instead of one-quarter of an ampere. The actual amount of current thus drawn from the cell must be estimated by subtracting the gain per hour due to the "open period" from the full hour closed circuit drain.

It has been demonstrated that one storage cell of battery will take care of three four-ohm sounders under ordinary working conditions, and require practically no attention after being properly charged and installed, other than to see that the evaporation of the fluid is compensated for by refilling the jar with a little water or acid when it falls too low.

(To be continued.)

[Important articles by Mr. Jones, appearing in back numbers, dating from January 1, 1904, copies of which may be had at twenty-five cents apiece, are as follows: A Useful and Simple Testing Device, January 1, 1904; The Bad Sender, His Past and Future, January 16; The Transmitting Typewriter Wire Connections, February 16; A New Transformer for the Alternating Current Quadruplex (J. C. Barclay, patent), March 1; Definitions of Electrical Terms—Unabridged, March 18 to April 16, inc.; June 1 to July 16, inc.; The Future Quadruplex (S. D. Field's invention), May 1-16; The Ghegan Multiplex, August 1; Proper Adjustment of Telegraph Apparatus, August 16-Sept. 1; Practical Information for Operators, October 1 to Dec. 1, inc.; Switchboard Practice at Intermediate Stations, December 16; Definition of the Terms Cycle, Period, Frequency, etc., Diagrams Interpreted, January 1, 1905; Lessons from the December Storm, January 16; The Bonus Wire, February 1; A Few Useful Methods, February 16; Co-operation, A Hint for Wire and Quad Chiefs, March 1; Measuring Resistance by Voltmeter Alone—Something About Ground Wires, March 16; Elementary Information Concerning Household Electrical Appliances, April 1 to May 1, inc.; The Barclay Printing Telegraph System, May 16; Polarized and Self-Adjusting Relays for Single Line Circuits, June 1; Limitations of Quadruplex Circuits, June 16; Electric Power From the Clouds, July 16; Concerning Condensers and Retardation Resistance Coils, August 1; District Call Box Service, August 16; The Art of Studying, Sept. 1; Other Methods of Splitting a Loop, Sept. 16; The Sextuplex, Oct. 1; A Few Questions Answered, Oct. 16; Positive and Negative Currents, Nov. 1; The Education and Evolution of a Chief Operator, Nov. 16; A Study of an Electric Circuit—Definition of the Principal Terms of Factors Which Regulate its Practical Output, Dec. 1; The Telephone—First Principles, Dec. 16, and Jan. 1, 1906; Questions Answered, Jan. 16; The Dynamo—Series, Shunt and Compound Wound, Feb. 1-16, March 1; The Storage Battery, March 16-April 1.]

Recent Telegraph Patents.

A patent, No. 814,852, for an electric sprinkler apparatus, has been issued to J. W. Larish, of Boston. An automatic alarm started off by incipient leakage in the sprinkler heads in buildings so equipped.

A patent, No. 815,809, for a telegraph key, has been obtained by John J. Ghegan, of Newark, N. J. A form of telegraph key having a spring lever supported to vibrate in a horizontal plane. The lever has a vertical flat disc for the engagement of the fingers.

A patent, No. 400,141, for a telegraphic transmitter, held by R. C. Stone, of New York, has expired.

Business Notices.

The Standard Underground Cable Company, of Pittsburg, and with numerous offices elsewhere throughout the country, has established still another new office to the chain, this time at Atlanta, Ga., in the Candler Building, of which Mr. C. A. Brown will have charge.

The Manufacturers' Advertising Bureau, of which Benjamin R. Western, who is well known

in the telegraph and electrical trades, is general manager, removed its offices on April 2 from 126 Liberty street to 237 Broadway.

Personal Mention.

Miss Jennye Creamer, the daughter of Mr. John M. Creamer, manager of the Western Union Telegraph Company, Baltimore, Md., will be married April 18 to Mr. Roy Anderson McCarty, of Pittsburg, Pa.

Mr. F. H. Knights, of the government telegraph department, Pretoria, South Africa, intends to visit the United States in June, while on a six months' leave of absence. This will be Mr. Knights' second trip to this country.

Mr. W. Boardman Reed, son of Henry A. Reed, of the Bishop Gutta-Percha Company, New York, has resigned his position of engineer of maintenance of way and buildings of the New York City Railway Company to take an active part in the management of the company of which his father is the head. The elder Mr. Reed is a well-known old timer and forty-niner of the telegraph, and was an intimate friend of Prof. Morse while the latter was a resident of Poughkeepsie, where Mr. Reed was manager of the telegraph office.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Colonel R. C. Clowry, president and general manager of the company, accompanied by Henry D. Estabrook, solicitor, and his wife, will sail for Europe on April 20, on the steamer Celtic, to be absent about six weeks, on a combined trip of business and pleasure. After a brief stay in England the party will cross to the Continent, and visit points in France, Germany and Switzerland.

Mr. Belvidere Brooks, general superintendent; Mr. G. F. Swortfiger, superintendent of construction; Mr. W. N. Fashbaugh, electrician of the Eastern division, and Mr. Gerald Brooks, secretary to the general superintendent, are absent on a trip of inspection covering that part of the Eastern division embraced in New York State, Pennsylvania, Maryland and the District of Columbia. Mr. Frank Jaynes, general superintendent of the Pacific division, San Francisco, Cal., and Charles Selden, superintendent of telegraph of the Baltimore and Ohio Railroad Company, Baltimore, Md., accompany the party.

Among the recent executive office visitors were Mr. D. R. Davies, superintendent of construction, Chicago; also Mr. C. R. Tilghman, of Cincinnati, Ohio, an attaché of the electrical engineer's office.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mr. William H. Baker, vice-president and general manager of the company, is in the South, whither he has gone on business.

Mr. Charles C. Adams, fourth vice-president,

is at his desk again, after an extended business trip to the Pacific coast, covering a period of six weeks, and in which he was accompanied by his wife.

Mr. Francis W. Jones, electrical engineer of the company, accompanied by his wife, has returned from a southern and western trip of about a month, undertaken mainly in the interests of the company, although two weeks of the time, devoted to social recreation, were passed at Palm Beach, Florida.

Miss Agnes C. Fagan, stenographer to Mr. John Doran, superintendent of the department of complaints and claims, and who is the eldest daughter of Mr. George F. Fagan, chief clerk of the executive office, has resigned her position and will be married on April 30 to Mr. Emmet Arthur Robbins, who is connected with the New York Herald.

The Cable.

Mr. Charles Adams-Randall, of New York, has an article in the current issue of Telephony, in which he discusses the subject of long ocean-cable telephony.

The annual report of the German Atlantic Telegraph Company shows a profit of nearly two million marks for the year. A dividend of six and one-half per cent. has been declared.

R. S. Yorke, a prominent English telegraph manager, died recently, aged forty-four years. At one time he was in the cable service and was an electrical engineer of some note.

Fanning Island, which is the mid-Pacific station for the all-British Pacific cable, and which was owned by British subjects, who became bankrupt, has, it is reported, been sold to the German government.

Max. Axelrod, Joseph Newsome and Paul Wienholz, of the Commercial Pacific Cable Company, San Francisco, Cal., have been transferred to Honolulu, while W. H. Grant, formerly of Manila, has been added to the San Francisco cable force.

The directors of the Mexican Telegraph Company have authorized the officers to arrange for increasing the capital stock of the company by \$1,000,000 to \$3,000,000, for the purpose of capitalizing earnings expended for the third Mexican Gulf cable, and other betterments acquired by the company to the extent of \$1,000,000. A shareholders' meeting will be held May 8 to approve the new stock issue as a dividend of 50 per cent. to shareholders of record at such time as may then be determined.

The laying of the cable between Guam and Japan by the converted cable steamer "Urneston Grange" for the Commercial Pacific Cable Company, is proceeding satisfactorily. The cable steamer "Silvertown," having paid out about 1,157 miles of cable from Manila, cut the cable and buoyed the end. She then proceeded to Woosung, where she trans-

ferred to a lighter the shore end, to be laid in the shallow waters of the Yangtse River, and she also transferred to a smaller ship, cable of an intermediate type to be laid between the shore end and the buoyed end of the main cable. The Silver-town herself is too cumbersome for inshore work. The final splice is expected momentarily.

Cable communication with the following places is interrupted:

Teneriffe since July 20, 1905.

Messages for Teneriffe and the Canary Islands may go "via France-Dakar."

Tangier since February 18, 1906.
Colon "via Jamaica" since Jan. 9, 1905.
Pinar del Rio "via Cayenne" since August 13, 1902.

Venezuela since January 12, 1906.

Messages for Venezuela may be mailed from Curacao or Trinidad.

Demerara since April 9, 1906.

Messages go from Trinidad by chartered or other vessels at frequent intervals.

Carl von Siemens, brother of the late Sir William Siemens and Dr. E. Werner von Siemens, died in Mentone, France, on March 21. He was chairman of Messrs. Siemens Brothers and Co., the cable and electrical manufacturers, at the time of his death. The network of telegraph lines which covers Russia was constructed by Carl Siemens for the Russian government. He was personally in charge of the laying of the Direct United States cable, the first one contracted for by the firm of Siemens Brothers, and also was the first to succeed in fishing up the broken end of this same cable from the greatest depth of the north Atlantic. At the time of his death he was a partner in the firm of Siemens and Halske, of Berlin, St. Petersburg and Vienna.

An electrocapillary recorder has been devised by Orling for recording submarine cable signals, says the London Electrical Review. The instrument works on the principle of the well-known capillary electrometer. A light lever rests upon the top of the column of mercury, and when raised by the latter, tilts a little aluminum carrier suspended from a horizontal cord. The carrier supports a delicate siphon, the upper end of which dips into a bath of ink, while the lower end faces the tape, upon which the signal is recorded, the siphon being kept in slight vibration by a thread attached to a vibrator, consisting of a light spring arm bearing on a moving wheel with a serrated rim. The receiving circuit is completed between the two bodies of mercury through the electrolyte, into which dip the capillary tubes, and when a potential difference is established between the terminals, according to the well-known phenomenon, the mercury rises or falls in the capillaries, and, therefore, in the vertical tube.

The Direct United States Cable Company has moved its New York main office from No. 60 to 61 New street, a building which extends through to 42 Broadway. This structure is a fine up-to-date skyscraper, known as the "42 Broadway Building." In selecting this location the company has secured convenient and spacious quarters for its several departments all on one floor. The receiving department has a private entrance at 61 New street,

back of which comes the operating room, the messengers being accommodated in a room directly in the rear of these. Next comes an apartment reserved for filing purposes, and then there is the private office of Mr. Clement Lee, the superintendent. Adjoining are the several rooms devoted to the needs of the cashier, assistant cashier, and the bookkeeping department. Other space furnishes accommodation for the supply departments, etc. A private hall extends the entire length of the suite, running parallel with the main corridor of the structure, opening into which are a number of doors, thus affording direct and easy access to any one of the various offices without passing through any of the others. Singularly enough these new quarters are located in close proximity to the site at 40 Broadway, occupied by the company for many years prior to the removal of the old building to make room for the modern edifice which now takes its place.

Resignations and Appointments.

The following changes have occurred in the Western Union Telegraph Company's service:

Mr. Charles Nabors has been appointed manager of the office at Uniontown, Pa., vice William Allison, resigned.

Mr. Thomas J. Meade, assistant chief operator in the office at Albany, N. Y., has been appointed chief operator at Buffalo, N. Y.

The following changes have occurred in the Postal Telegraph-Cable Company's service:

Mr. H. S. Brasher, of Dallas, Tex., has been appointed manager at South McAlester, Indian Ty., vice O. L. West, transferred to Muskogee, Ind. Ty., in the same capacity.

Obituary.

W. S. McDermott, aged fifty-six years, for many years manager of the Western Union Telegraph Company at Kenosha, Wis., died at that point March 30.

Thomas Stenson, sixty-three years of age, at one time manager of the Western Union Telegraph Company at Jamaica, L. I., died at that place March 23.

Charles G. Holland, aged sixty years, for over forty years connected with the New York office of The Associated Press, and for twenty years its day manager, died March 26 at his home in New York.

John J. De Courcy, aged forty-one years, and prior to January last, when he resigned to enter other business, manager of the Postal Telegraph-Cable Company at Malden, Mass., met his death by accidental drowning March 20.

Don't borrow your neighbor's paper; subscribe yourself for TELEGRAPH AGE. You can't afford to be without it.

General Mention.

The underground telegraph cable between London and Glasgow, England, was declared to be in working order on March 31.

Mr. Frank J. Ryan, a former Associated Press operator, and a resident of Kansas, is a candidate for the position of Secretary of State of Kansas, and it looks as though he might win the prize.

An official return relating to the English Post Office telegraph and telephone service in the year ended March 31, 1905, shows that the expenditure exceeded the total receipts by £987,739 10s. The total expenditure was £4,839,458 13s. 5½d.

Mr. C. E. Clayton, telegraph operator of the Chicago, Burlington and Quincy Railroad Company at Richards, Ill., has been advanced to the position of assistant car distributor at Aurora. He is succeeded at Richards by Miss Anna Steele.

All telegraph offices in the Western Union and Postal Telegraph-Cable systems have been instructed to place the letter x in the check of each message to which an answer is desired. When such a message is received at any office the delivery clerk will instruct the messenger boy to use every endeavor to obtain an answer.

Mr. W. B. Eddy, an old time telegrapher, now identified with the Hudson River Telephone Company, at Albany, N. Y., in a recent letter, renewing his subscription, writes: "I look forward to the receipt of TELEGRAPH AGE each issue with much pleasure. It seems like renewing acquaintance with a great many of my old telegraph friends."

Mr. C. J. H. Woodbury, of Boston, assistant engineer of the American Telephone and Telegraph Company, prefaced a recent address by remarking: "I know of no more promising field today where the technically educated young man can fulfill the true mission of the engineer as an economist, than in the development of the modern telephone system."

Mr. W. G. Phillips, now in the brokerage business at Cisco, Tex., in a recent letter explaining why he went into business for himself, writes: "I feel quite sure it was due to the encouragement I received from reading TELEGRAPH AGE. This stimulated me to make the endeavor to at least reach the top of my profession. My success was such as to inspire the necessary confidence which enabled me to successfully make this last venture, and I am not sorry I made the change."

The Railroad.

The Maine Central Railroad has recently installed the telegraph system on its line.

The Union and Southern Pacific Railroads have ordered 2,000 telephones to equip an independent long distance line which they have decided to build

from Omaha, Neb., to San Francisco, Cal. The line will be used by trainmen and officials. Telephones will be put in at every blind siding as well as in every town.

The Association of Railway Telegraph Superintendents will meet this year at Denver, Col., on June 20, and will make the Adams Hotel in that city its headquarters. From present indications there will be a large attendance, for the meeting promises to be one of special interest, many important topics coming up for consideration.

Arrangements are being made by the Grand Trunk Railway Company, Canada, for a long distance telephone installation of their own over their entire system. The central exchange will be at the general offices of the company, Montreal, where the switchboard, with all the necessary terminal facilities, will be erected, and the wires will run from Montreal to Portland, Me., on the one hand and from Montreal to Chicago on the other.

Wireless Telegraphy.

The stockholders of the Marconi Wireless Telegraph Company of America will hold their annual meeting at No. 15 Exchange place, Jersey City, April 16.

Mr. William Marconi, who was to lecture before the New York Electrical Society at Columbia University, New York, on April 4, on the subject of wireless telegraphy, was unable to appear because of illness which prevented him from leaving England.

For \$55,000 the Navy Department, through the Bureau of Equipment, agreed March 23 to purchase five wireless telegraph stations on the Gulf of Mexico, erected and equipped by the DeForest company in the last year and a half. Under the contract the company provided the equipment of the stations and put them in a working condition. They are located at Pensacola, Key West, Guantanamo, San Juan, P. R., and Colon.

At Los Angeles, Cal., on March 21, the receiving operator at the local station of a wireless telegraph company, although several blocks distant from the Santa Fe Railroad offices, heard the Santa Fe operator calling "Vg," which is the telegraph call for Las Vegas, N. M. The wireless operator attuned his instrument and then heard and took down portions of a lengthy message regarding Santa Fe business. Later in the day the same operator caught the replies being sent from Las Vegas. The wireless operator then called up the Santa Fe offices and verified the messages which he had received. There is no connection of any sort between the office of the Santa Fe and the wireless company, excepting the ordinary telephone connections, which are in no way joined with the telegraph instruments of either office.

On Wednesday night, March 28, according to the statements of employes and officers of the De Forest wireless telegraph system, 572 words were

flashed across the Atlantic Ocean, from Coney Island to the coast of Ireland, a distance of 3,200 miles. For several nights the Coney Island station had been sending messages across the ocean, and these messages had been received in large part by the operators in Ireland. Wednesday night, however, marked the maximum of achievement. On that night a total of 1,000 words was sent out from the Coney Island station. The messages were sent in various keys, pitches or tunes in order to ascertain the correct one. Ireland reported by cable Thursday morning that 572 of these words were received and recorded. As yet no messages have been sent from Ireland to Coney Island, the transmitting apparatus not yet being in place on the other side of the ocean. A cable dispatch from London, April 3, denies that any such message as stated above was received in Ireland.

Experiments were conducted at Dr. Graham Bell's kite station in Virginia, on March 27, with a view of determining whether kites may be used in place of masts for wireless telegraph stations where the conditions make the use of masts impracticable. The experiments were made through an arrangement between Dr. Bell and a wireless telegraph company, and were in every way successful. In the course of the experiments messages were sent from Washington and received through a kite flying at a height of 500 feet. A wire was suspended from the kite and in one experiment the messages were received through the human body. One man held the wire and the message passed through him and through still another man who held the receiver. The kite caught a message that was being sent from the steamship Bermudian of the Quebec steamship company, lying at her pier in New York city, to the De Forest company offices, and another message being sent from the station at Galilee, N. J., to a ship at sea.

Lieutenant-Commander S. S. Robison, United States Navy, recently told of the work of the Navy Department in wireless telegraphy. The department now, he said, has about thirty-five land stations working, and about fifty stations aboard ships. Plans are being made for still more. Several years ago, he said, a board was appointed to consider the question, and gave its development to the Navy Department, with an order to construct a chain of stations along the Atlantic and Pacific coasts of the United States, in the canal zone and the Philippine Islands, and providing ships with the apparatus. That work has been partially accomplished. On the Atlantic coast there are stations at Portland, Me.; Portsmouth, Boston, Cape Cod, Newport, Montauk, New York navy yard, Navesink, Annapolis, Washington, Cape Henry, Norfolk, Diamond Shoals Point, Charleston, St. Augustine, Key West, Pensacola, Cuba, Porto Rico, New Orleans and Colon. On the Pacific Coast there are stations at San Diego, near Santa Barbara, Farallone Islands, off the Golden Gate; Goat Island, in San Francisco Bay; Mare Island. Three or four others are to be built further north. There is one at Hono-

lulu, one on the island of Guam, and another at Cavite, in the Philippines. Others are designed, so that the commander of the Pacific squadron can always be in touch with his ships on the ocean. Tests made by the department so far demonstrate several things of a peculiar nature. Messages can be transmitted better at night than in the daytime; better over water than over land, and better over land with long waves than with short waves. In tests made between Key West and Colon, about 1,060 miles, communications were carried on at night, but not in the daytime, and the same results were obtained between Key West and San Juan, Porto Rico. The longest distance over which ships have communicated at night is 1,200 miles. The present aim, he said, is reliable communication, night or day, at 200 miles.

Municipal Electricians.

The eleventh annual convention of the International Association of Municipal Electricians will be held at New Haven, Conn., August 15, 16 and 17. At this meeting the following papers will be presented and discussed: "History of the Fire Alarm and Police Telegraph," "Details of Certain Auxiliaries to Fire Alarm Apparatus," "Advisability of Protecting Municipal Electricians by the Civil Service Laws," "Comparison of Underground and Overhead Wiring, and of the Relative Values of Single, Rubber-Covered Wire and Lead-Encased Cable for Underground Construction," and "Conditions Surrounding the Inspection of wires in the Southwest."

In addition to these papers, the "Question Box" will be a feature at this meeting. To the end that it may be made of special interest, members are requested, if they have any questions that they would like to have explained, to send them to the secretary, who will assign them to some one who is competent to answer them fully. It may seem to some that the question they desire to propound is a simple one, but it is urged that no hesitation may be felt on that account, for the point raised may be of importance in its bearing on the conditions existing in some other part of the country.

The secretary of the association, Frank P. Foster, of Corning, N. Y., asks those who are eligible, but whose names are not enrolled as members, why they are not so entered. He will furnish application blanks and information to all who may require the same, and urges correspondence on the subject.

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

If you are not familiar with TELEGRAPH AGE, a postal card request will bring a sample copy to your address.

The Invention of the Telephone.

(Concluded from page 151, issue of April 1.)

It was after this that Bell resigned his position at Boston University and Watson his position in Williams' shop, and together they fitted up a laboratory in the boarding house in Exeter place. There, on March 10, 1876, after meeting and overcoming many perplexities and discouragements, they had the pleasure—it seemed that, and nothing more, to the young enthusiasts—of being the principals in the transmission of the first telephone message. They were experimenting, as usual, to produce something more than a mere drone or suggestion of human speech. Suddenly, in faint but distinct tones, came the message—the first intelligible words ever transmitted by electricity: "Mr. Watson . . . Come here . . . I want you."

Commonplace enough, but epochal! Doubtless if Bell had been sure of success that afternoon he would have been prepared to say something worthier of the occasion. But he was not prepared. Some slight improvement in the instruments, or it may have been some added expertness in the use of them just made the difference between indistinctness and distinctness.

Thereafter, the development of the telephone was rapid, so rapid, indeed, that in a few months it was possible to converse fluently between the two rooms. In June, Mr. Bell brought his invention into public notice for the first time by exhibiting it at the Centennial in Philadelphia. The effect produced by this exhibition may be gauged by the report made by Lord Kelvin (then Sir William Thomson): "With my ear pressed against this disk I heard it speak distinctly several sentences, first all simple monosyllables 'To be or not to be' (marvelously distinct); afterwards sentences from a newspaper. . . . I need hardly say that I was astonished and delighted. So were others, including some other judges of our group, who witnessed the experiments and verified transmission of speech. This, perhaps the greatest marvel hitherto achieved by the electric telegraph, has been obtained by appliances of quite a homespun and rudimentary character."

It certainly was a crude device, that first telephone, compared with the compact and convenient apparatus that stands to-day on the business man's desk; yet it served its purpose—it transmitted articulate speech. The question that remained was, how far could speech be transmitted?

On October 9, 1876, came the grand experiment. Until then, Bell and Watson had confined themselves to sending messages back and forth between their rooms in Exeter place. Now they were to try "long distance" telephoning in earnest over the two-mile telegraph wire of the Walworth Manufacturing Company, which ran from the office in Kilby street to the factory at Cambridge. Bell took charge of the Boston station and Watson of the other. At a given signal Watson disconnected his telegraph instrument from

the circuit, connected his telephone and listened for Bell's voice. At first, all he could hear was an incoherent murmur, and the gloomy thought occurred to him that perhaps the telegraph wire would not serve their purpose. (In their Exeter place experiments they had used small wires, much like those attached to the telephone of to-day; and these wires, by the way, are now in Mr. Watson's possession.) The instruments and their connections were carefully readjusted; but again there was no suggestion of speech. It was a critical moment. As a last resort Watson thought he would examine the wires at his station, and on going into an adjoining room he found a high resistance telegraph relay in the circuit. Cutting this out, he hurried back to the telephone and listened. The relay was the sole cause of the trouble, for now Mr. Watson heard Bell's voice clearly; and, as he says himself, "we found that we could talk with perfect ease although we were two miles apart."

Some doubt had been expressed whether the telephone, even though it were a practical idea, could transmit messages as accurately as the telegraph, and so Bell and Watson had previously arranged to report their first long-distance conversation. Later, when they compared notes, they found that, as they had hoped, the telephone had done its work perfectly.

Mr. Watson relates that, on his way back to Boston, he could scarcely refrain from telling the other passengers in the car that he had just been talking by telephone with a man in Boston. Fortunately he was able to keep the news to himself. They might have given him over to a policeman as an escaped lunatic. An hour or so later, when Bell reached Exeter place, he grasped his associate by the shoulders, wheeled him around the room, and shouted in an ecstasy of joy, "Watson, this night's work will make me famous."

And it did. Early in 1877, Mr. Bell, Gardner Green Hubbard, of Cambridge (who later became his father-in-law), Thomas Sanders, of Salem, and Mr. Watson formed the first Bell Telephone Company. Here are some interesting extracts from the company's first circular, dated May, 1877:

The proprietors of the telephone, the invention of Alexander Graham Bell, for which patents have been issued by the United States and Great Britain, are now prepared to furnish telephones for the transmission of articulate speech through instruments not more than twenty miles apart. Conversation can be easily carried on after slight practice and with the occasional repetition of a word or sentence. On first listening to the telephone * * * the articulation seems to be indistinct; but after a few trials the ear becomes accustomed to the peculiar sounds and finds but little difficulty in understanding the words.

The advantages of the telephone over the telegraph for local business are: First, that no skilled operator is required, but direct communication may be had by speech without the intervention of a third person; second, that the communication is more rapid, the

average number of words transmitted a minute by Morse sounder being from fifteen to twenty, by telephone from one to two hundred; third, that no expense is required either for its operation, maintenance, or repair. It needs no battery, and has no complicated machinery. It is unsurpassed for economy and simplicity.

The company also announced that "telegraph lines would be constructed by the proprietors, if desired."

A few months later, Bell thought he would try to telephone from New York to Boston. The attempt was made under difficulties. First of all, the noise that had been raised o' nights when Watson was talking or singing for the entertainment of audiences gathered in nearby cities to see Bell's demonstration had somewhat strained the temper of the landlady of the Exeter place house, and, furthermore, the young men had not been in the habit of going out of their way to find her on rent day. Watson, who was to take charge of the local station in this experiment, realized that he must smother his cries (long distance telephony in those infant days being a matter of stentorian tone production), so he made a tent of blankets, and on this sizzling August night installed himself within. To preclude trouble at the New York end of the line (they used an Atlantic and Pacific telegraph wire) Bell had stowed himself and his apparatus in a closet in the telegraph office. As the result of this mid-summer night's performance, the young enthusiasts almost died of exhaustion. All for nothing. Long distance telephony, such as Americans are familiar with to-day, had to wait for the invention of hard drawn copper wire by Thomas B. Doolittle, one of the Bell engineers, before it became an unqualified success. Anyhow, that was virtually the end of the famous work at Exeter place. Those early days of the telephone were full of fiascos. Old Bostonians recall how a large assembly went to a hall in Back Bay to hear over the telephone a concert given in Providence by the then famous American Band, but, as the story-teller put it, "they didn't hear a thing."

The first Bell Company had a hard time of it. The public in general was disposed to regard the telephone as a toy. On the other hand, the telegraph men took it so seriously that they prepared to destroy their young competitors. At one time the clouds were so black that Bell and his associates offered to sell out, patents, property and all, to the Western Union Telegraph Company for \$100,000. Fortunately for them—as it turned out—the offer was rejected. The struggle went to the courts, and, in the still celebrated litigation, the Bell patents were sustained at every point.

What are Atoms, Electrons, and Ions?

The phenomena of the Crookes tube, of Roentgen rays, and latterly of radium, inexplicable by the chemical theories of a decade ago, have ren-

dered necessary the coining of several new words, which have taken their place in the vocabulary of the modern physicist. We hear so much these days of electrons and ions and their relation to the old-time supposedly indivisible atom that the time seems ripe for a few simple definitions condensed from a recent paper by Prof. Soddy.

The first and oldest conception of the ultimate unit of matter is the "atom," the smallest particle of an element capable of separate existence. The essential feature of Dalton's conception was that the atoms of the same element are all exactly alike in mass and every other property, but are recognizably different from the atoms of any other kind of element. The statement will be found in text-books of chemistry written long before the recent discoveries were foreshadowed, that if it is ever found possible to transmute any one kind of atom, that is, any one kind of elementary matter, into any other kind, there is little doubt that the same means would be sufficient to transmute or decompose the other elements.

The modern conception of the ultimate unit is the "electron," and this, although by origin an electrical conception, is in reality a material conception no less than the atom of matter. The electron could be defined as the smallest existence known capable of isolation and of free movement through space. It is a definite amount of "charge" of negative electricity, in a word, the smallest possible amount known to exist; for electricity, no less than matter, has been shown to consist of discrete particles or units, and not to occupy space continuously. Unlike the atoms of matter, only one kind of electron is known, consisting of the same amount or charge of negative electricity with identical properties in all its various manifestations.

It is certain that each atom of matter contains in the normal condition at least one electron, which it is capable of losing, and conversely that it may unite with at least one electron more than it normally possesses without deep-seated material change. An atom with one or more electrons less than it possesses in the normal state is positively charged and is often called a "positive ion." Similarly an atom with one or more electrons in excess is a "negative ion."

Preserve Your Papers.

By taking a little trouble, when TELEGRAPH AGE first comes to hand, it may be preserved to form a permanent and valuable addition to the reading matter of a kind which all telegraphers should be supplied. We furnish a neat and attractive cloth board binder, which will be sent by mail, prepaid, for \$1.00. It has good, strong covers, on which the name TELEGRAPH AGE is stamped in gold, and means by which each issue may be securely held as in a bound book. One binder may thus be made serviceable for a number of years, and when successive volumes, as they are completed, are bound in permanent form, the subscriber ultimately finds himself, for a moderate cost, in possession of a most valuable addition to his library, embracing a wide variety of telegraph, electrical and general information.

The Real Value

of a **Typewriter** is in the work it will do. If it produces poor work, is clumsy and hard to operate, slow in use or frequently out of order, then it is a poor typewriter.

If it does good, clean, clear-cut work, runs light and easy, can be operated at the highest speed, is durable and can be depended upon every day, year in and year out, it's a good typewriter.

The one machine that does all these things better than any other one is the one you need—the one you ought to buy—the



Fully Guaranteed

FAY-SHOLES

Maybe you have always used some other make, probably you or your operator prefer the so-and-so machine, and possibly you have never used, tried or even examined a Fay-Sholes, but you cannot overlook the fact that it has won first place in 14 out of the 15 important free-for-all public speed contests held since 1898, and that for years many of the largest concerns in the world and thousands of expert and experienced operators have and are today using the Fay-Sholes—not by any mere chance or accident, but because the **Fay-Sholes Typewriter** will produce more good work in a given time with less effort than any other typewriter made.

What has been done over and over can be done easily enough again—you can test a Fay-Sholes, at our expense, in your office on your own class of work to prove these facts.

In important cities we have sales agencies, but the customer located in the smallest town or in the most out-of-the-way place can deal direct by mail just as easily and safely as if he called at our general office, as all customers are treated exactly alike—every machine we sell is guaranteed for one year.

Regular correspondence machine, either No. 6 or No. 7 model, complete with cloth cover, box of tools and an instruction book, for:

\$100.00 on easy payments of \$10.00 down and \$7.50 per month—no interest.

\$50.00 payable \$22.50 down and \$22.50 in 30, 60 and 90 days—no interest.

\$35.00 to responsible parties on 30 days open account.

\$3.30—Cash with Order.

Second-hand typewriters taken in exchange as part payment.

Full information and handsome catalogue for the asking—ask now. Local Agents Wanted.

The Arithmograph Company
1074 Majestic Bldg., Chicago

KEEP UP-TO-DATE

SUBSCRIBE FOR

TELEGRAPH AGE

IF NOT A SUBSCRIBER

WRITE FOR SAMPLE COPY

DIAMONDS



ON CREDIT FOR EASTER GIFTS

CUPID IS OUR BEST AGENT, HE FINDS PLACES FOR DIAMOND RINGS EVERY DAY. HE WORKS AMONG ALL CLASSES, FROM THE MODEST CLERK TO THE WEALTHY EMPLOYER, AND WE FILL HIS ORDERS, OPENING A CONFIDENTIAL CHARGE ACCOUNT WITH EACH OF HIS CLIENTS. THE GOODS ARE DELIVERED AT ONCE. WE ASK

No Security, No Endorsements, No Interest

We open hundreds of confidential charge accounts every business day for **Diamond Rings, Pins, Brooches, Locketts, etc., and High Grade Ladies' and Gents' Watches**, and the larger percentage of these accounts are with persons who had always considered **Genuine Diamonds** a luxury until they read our little booklet: "HOW EASILY YOU CAN WEAR AND OWN A DIAMOND." It answers every question, and tells how every honest person, no matter where they live, can select any article they desire from our **Million Dollar Stock**. Have it sent to them on approval subject to examination, paying only one-fifth the cost on delivery and the balance in eight equal monthly payments.

Buying a Diamond is Not an Extravagance

It is a wise investment in the most valuable, stable and quickest cash producing gem in the world. Diamonds have increased in value more than twenty per cent in the past twelve months and the best of European authorities predict an even greater increase during the coming year.

Our Prices Are From 10 to 15 Per Cent Lower

than the ordinary spot cash retail jeweler. This is made possible by the fact that we are direct importers and sell a thousand Diamonds where the retail jeweler sells but one. **Write for our Catalog today.**

Our Handsome New Catalog a copy of which will be mailed to you with booklet mentioned above, contains 86 pages and 1,000 illustrations of all that is new and up-to-date in artistic jewelry. It affords you the pleasure of selecting in the privacy of your own home such articles of jewelry as you may desire for yourself or your loved ones.

Our Guarantee, aside from the fact that we are one of the oldest (est. 1858) and the **Largest Jewelry House** in the U. S., we give a signed guarantee as to quality and value with every Diamond sold. You can exchange any Diamond bought of us at any time for other jewelry or larger stone. **Write for our Catalog and Booklet. Mailed Free.**

The Old Reliable Original Diamonds on Credit House

LOFTIS
BROS & CO. 1858

DIAMOND CUTTERS
Watchmakers - Jewelers
Dept. D44 92 to 98 State Street
CHICAGO, ILL., U. S. A.

THE TELEGRAPHERS' MUTUAL BENEFIT ASSOCIATION

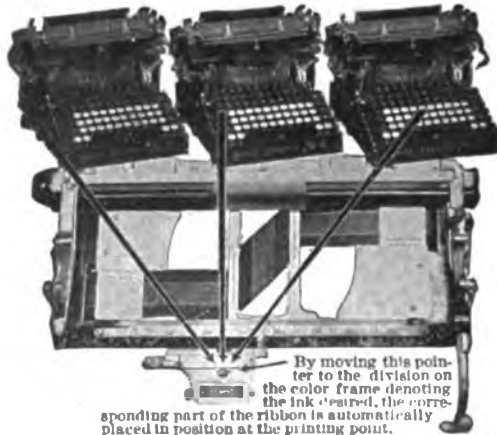
THIRTY-NINTH YEAR

FOR ALL EMPLOYEES IN TELEGRAPH OR TELEPHONE SERVICE

Insurance, Full Grade, \$1,000; Half Grade, \$500; or Both Grades, \$1,500; Initiation Fee, \$2 for each grade

ASSETS \$250,000. Monthly Assessments at rates according to age at entry. Ages 18 to 30, Full Grade, \$1.00; Half Grade, 50c.; 30 to 35, Full Grade, \$1.25; Half Grade, 63c. 35 to 40, Full Grade \$1.50

M. J. O'LEARY, Sec'y, P. O. Box 510 NEW YORK.



By moving this pointer to the division on the color frame denoting the ink desired, the corresponding part of the ribbon is automatically placed in position at the printing point.

Three Smith Premiers in One

The business world of to-day demands three kinds of typewriting—

- That which is permanent for record purposes,
- That from which letterpress copies can be made,
- That in which certain parts are brought into prominence by the use of a special color.

The New Tri-Chrome Smith Premier, having one ribbon combining black record, purple copy and red for emphasis, meets all three of these demands.

A simple movement of the little lever on the color frame brings the desired kind of ribbon into play.

This New Tri-Chrome Ribbon Machine, with all the good fundamental features of former models, gives the Smith Premier the widest possible field of usefulness.

Branch Stores Everywhere

THE SMITH PREMIER TYPEWRITER CO.

SYRACUSE, N. Y.

THE GAMEWELL FIRE ALARM TEL. CO.

19 BARCLAY ST., NEW YORK.

Gold Medal awarded at Berlin, Germany, Exposition of Appliances for Fire Prevention and Fire Extinguishment.

FIRE ALARM and POLICE SIGNAL TELEGRAPHS
For Cities and Towns.

Over 1,000 Plants in Actual Service.

SELLING AGENTS:

Frank C. Stover,
101-103 Randolph Street, Chicago, Ill.
The A. J. Coffee Company,
330 Market Street, San Francisco, Cal.
Oliver P. Croker, Atlanta, Ga.
A. D. Wheeler,
178 Devonshire Street, Boston, Mass.
Chas. Berst,
1107 Traction Building, Cincinnati, O.
Utica Fire-Alarm Telegraph Co., Utica, N. Y.
General Fire Appliance Co.,
Johannesburg, S. Africa.

The Telegraph Chronicle

is the only telegraph newspaper published in England. All who wish to know what is going on in the British Postal Telegraph Service and to keep abreast of the progress of technical improvements in telegraphic apparatus and methods, should subscribe to the

TELEGRAPH CHRONICLE.

Published fortnightly at 129 Penny Road, London, S. E. Subscription, post-free, Five Shillings per Annum. The TELEGRAPH CHRONICLE is the organ of the Postal Telegraph Clerks' Association, the most powerful organization of telegraphers in the world.

JUST OUT.

SMALL ACCUMULATORS. PRICE 50c.

HOW TO MAKE AND USE THEM.
With Numerous Illustrations.

BY P. MARSHALL.

Mailed postpaid to any address on receipt of price.

J. B. TALTAVALL, Telegraph Age.

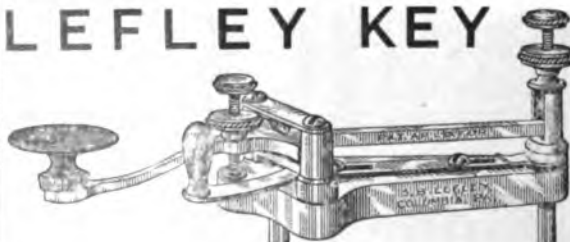
253 Broadway, - - - New York

Please mention Telegraph Age when communicating with advertisers.



AGENT IS ALL IT COSTS to write postal for our big Free Bicycle catalog showing all models at lowest prices. **DO NOT BUY** a bicycle or a pair of tires until you learn our marvelous new offer. We ship on approval without a cent deposit, prepay freight, allow 10 Days Free Trial—All our new and wonderful propositions with catalogues and much valuable information sent you FREE for the asking. **WE WILL CONVINCE** you that we sell a better bicycle for less money than any other house. Buy direct from the factory. If you want to **Make Money or Earn a Bicycle** write for our Special Offer. **TIRES, Coaster-Brakes, built-up-wheels and all sundries at half usual prices. Do Not Wait, but write us a postal today and learn everything. Write it now.**
MEAD CYCLE CO. Dept. 7142, Chicago, Ill.

LEFLEY KEY



The Fastest Telegraph Key in the World.

movement of key knob; the hardened steel knife blade trunnions, which prevent all side motion, combined with the light, springy lever and the flat contact plate, impart to it the qualities of Speed, Ease, Firm and Clear-cut Morse and wearing qualities possessed by no other key on the market.

LEG PATTERN.....\$4.00
LEGLESS "\$4.50

Remit by draft, Post Office or Express Money Order.

With highly burnished Brass Base and Posts well lacquered; lever and name-plate of high grade carbon (spring) steel; heavily nickel plated; makes a beautiful key; the large opening between contact points, with a small

S. B. LEFLEY, Columbia, Pa. No. 1, R. F. D.

Telegraph Age.

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

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

TERMS OF SUBSCRIPTION.

One Copy, One Year, - - - - -	\$1.50
One Copy, Six Months, - - - - -	.75
Foreign Countries, - - - - -	2.00

ADDRESS ALL COMMUNICATIONS TO

J. B. TALTAVALL, - Editor and Publisher,
253 BROADWAY, NEW YORK.

E. H. BOWEN, ASSOCIATE EDITOR.
WILLIE H. JONES, ELECTRICAL EDITOR

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

CABLE ADDRESS: "Telegraph," New York.
Telephone, 4148—Cortlandt.

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.
REMITTANCES to Telegraph Age should be made invariably by draft on New York, postal or express money order, and never by cash loosely enclosed in an envelope. By the latter method money is liable to be lost, and if so remitted is at the risk of the sender.

NEW YORK, APRIL 16, 1906.

The Book Department of TELEGRAPH AGE, always a prominent and carefully conducted feature of this journal, has, in obedience to continually growing demands made upon it, materially increased its facilities of late. The desire is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished, promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same. These will be of especial aid to buyers inasmuch as they contain brief descriptive references of each volume listed, frequently with full chapter titles.

The electrification of steam railroads is going to impose on the telegraph and telephone companies an electrical problem that promises to be difficult of solution. The Western Union Telegraph Company, whose lines parallel the railroads to a large extent, will be the greatest sufferer from this new source of trouble, although the wires of both the Postal Telegraph-Cable Company and the American Telephone and Telegraph Company will be very largely within the high tension electrical zone, estimated to embrace all paralleling lines within reach of five miles.

Mr. Gardner Irving, who recently retired from the presidency of the New York Telegraphers' Aid Society, which he has held for two consecutive terms, in an admirable speech made on the occasion, dealing with the affairs of the society, called attention to a case where money is being paid for

disability, which is decidedly unique in the annals of this, or probably in those of any other, society of similar character. He referred to a young man who is confined in an asylum because of insanity, yet who is in perfect health bodily, and who may in the ordinary course of events, live to be an old man. He pointed out that if the non-compos lives twenty-five years more he will have had paid to him \$1,250, added to which the sum of \$300 already paid, a total amount of \$1,550. He also called attention to the fact that there would then be due another hundred dollars for burial. While of course this is an extreme case, it nevertheless possesses peculiar significance, and introduces a matter for which consideration was asked, to which end Mr. Irving urged the appointment of a committee.

A Boston Telegraphic Tournament.

Once again a telegraphic tournament, international in character, is to be undertaken, the event this time being scheduled to come off at Boston early in June. Much may be said in commendation of such an affair. It appeals strongly to the telegraphic mind, particularly to the young and aspiring element, for it affords an opportunity under conditions at once attractive in plan and scope for a competitive trial of skill and speed in telegraphing stimulated by the hope of gaining public approval and of the flattering prize award. As the Boston telegraphers, and the "Hub" shelters some of the very best within its corporate limits, appear to have resolutely set about to make their "meet" a success, Yankee grit will undoubtedly carry the day in this respect. Apart from the fact that the tournament is expected to attract the best telegraphic operating skill in the country, the further object is to raise sufficient money to pay a balance due on a bed endowment for telegraphers in one of the Boston hospitals, reasons sufficient to entitle the enterprise to the moral and practical aid of the telegraph companies. A correspondent in another column refers to the tournament at length.

The Invention of Printing Telegraph Systems.

The production of a successful automatic and printing telegraph system has fired the imagination and stirred the inventive genius of many. It has offered an attractive field for effort and experimentation in telegraphic procedure almost without parallel, and many really bright minds have been devoted to its study. Naturally the columns of TELEGRAPH AGE have been sought by inventors of such systems through which to describe their inventions and present their claims for recognition. The result has been that during the past few years considerable space has been surrendered to articles of this nature. As a telegraphic newspaper, independent in thought and deed, whose purpose it is to publish without bias all information pertaining to the telegraph, we have made it a rule never to curtail or abridge any proper statement made by inventors or others

in explaining or describing such systems of telegraphy in which they may have been interested in producing. The object has been to permit those who had worked out new methods in which at least some degree of merit appeared, any advantage that might accrue by its publication in a telegraphic journal whose pages are read by the managers of telegraphs the world over. These contributions were of value, inasmuch as they added to the general literature of the subject discussed, and frequently brought light and intelligent thought to the elucidation of a highly complex problem, even though failing to reach a correct solution of the same. The worth of the inventions described in some particulars have occasionally gained recognition to the extent that general managers of telegraphs have afforded facilities for a demonstration of the same in order that the sometimes specious claims advanced for the new systems might be subjected to careful tests, with a view of determining their commercial value, as distinct from any theoretical or laboratory estimate of worth, for the practical telegraphic executive is ever mindful of possible improvements in transmission.

Inventors in the field of printing and automatic telegraphy may rest assured that whatever the merits inherent in their systems—and some have developed truths in one direction and some in another—the same have not escaped notice, for the fact remains that all inventions of this nature, as described in these columns, have sooner or later received due consideration at the hands of telegraph officials both at home and abroad.

"Tattling" Operators.

Apropos of our criticism published in the issue of March 16 in answer to an editorial in the New York Tribune on "Tattling Operators," passing strictures on telegraph operators for sometimes supposed tattling propensities in disclosing the contents of telegrams, a prominent western telegraph manager had this to say in discussing the subject with a local newspaper:

"In all my thirty-seven years' experience in the telegraph service there has not been, to my knowledge, a single instance of any of our operators betraying the sacred trust reposed in him. The telegraph is secret, and the secrets in the messages entrusted to the company for transmission are as sacredly guarded as any loyal member of any secret organization guards that knowledge he has given his pledge to preserve. Operators are given to understand it is one of their most important duties to keep from the ears of the outside world the contents of the thousands of messages that pass through their hands daily. There are perhaps no other men who carry more secrets, and keep them, too, than the great army of telegraph operators. It is tacitly understood that the secrecy of the telegraph is inviolate, and we have had no trouble on that score.

"I will acknowledge, however, that some very peculiar things have occurred which have fre-

quently made it look as if an operator had betrayed his trust. A careful investigation, coupled with some clever detective work, has in each of this kind of cases with which I am familiar, resulted in locating the 'leaks' outside of the office.

"Frequently newspaper men cause suspicion to fall upon our operators. I recall an instance where a reporter 'queried' a paper in a distant city on a story he thought he had exclusively. Another paper got wind of the story, after the query had been sent, which made it look very much like we were guilty of a betrayal of trust. We immediately started an investigation, and it did not take very long to satisfy everybody concerned that the trouble was entirely outside our office.

"All messages, no matter who sends them—the millionaire or the pauper, the clergyman or the criminal—all are guarded with an equal sacredness to preserve the secrecy of their contents."

Underground Telegraph Wires.

The completion of the underground connection between London and Scotland marks an epoch in the history of English telegraphy. The business of the country, as well as the preservation of rapid private communication, is no longer completely at the mercy of a furious gale which has periodically blown down the aerial wires and cut the telegraphic communication between the metropolis and distant industrial towns, sometimes isolating Scotland and Ireland for many days at a time.

The main difficulties in the way of providing this underground system have been—first, the cost, which is enormous; and second, certain electrical obstacles, which are even more grave and troublesome than the financial one. Germany was the first to attempt to overcome the troubles of broken communication by a subterranean system when, in the early seventies, such a means of communication was established between the principal cities of the empire and Berlin. France followed suit in 1879, as the result of a great storm that isolated Paris in 1875.

The cost of the French system up to date has been stated at many millions, but the engineers are of the opinion that the economies in maintenance more than counterbalance this enormous expenditure. It is asserted, for example, that the French underground lines have never had to be replaced to any large extent. With the improvements in construction that are now in use the limits of this durability should be exceeded.

It was because of many obstacles and electrical problems that the laying of underground lines in Great Britain has been so long delayed. But the completion of the line to Scotland gives ample scope for observation and experiment.

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

The Safer Ways of Crime.

The decision of the New York District Attorney's office to carry to the higher courts for re-determination the legal questions involved in one of the most famous of alleged recent "wire-tapping" cases—that of last February, in which John Felix was the victim—has some very interesting and important aspects. The sum of money lost in this case made it remarkable, as well as the elaborate preparations for the swindle. Felix was decoyed to a room which purported to be a branch telegraph office. After a talk with the supposed "manager," he was conducted to an office where bets were apparently being made on the New Orleans races. His new acquaintance at the "telegraph office" pretended to supply him with information by telephone as to winners ten minutes in advance of its transmission over the wires. After making one small bet and winning, he subsequently put up large sums on races following, aggregating \$50,000, according to his "tips," but was told that "the similarity of colors of the jockeys caused a mistake."

This extremely ingenious cheat belongs to a class with which the law as now interpreted finds it almost impossible to deal. As in the "green goods" and several other very intricate "games," the victim is himself contemplating an illegal act. "Green-goods men" and "wire-tappers" are arrested often enough, but are not even brought to trial unless there exist some special circumstances which put the offense in another category. The reason is to be found between the calf covers of the volumes of judicial decisions.

Thirty-six years ago, in June, 1870, a certain Charles C. Miller was approached by a stranger who declared that he was a police officer, and that he had a warrant for Miller's arrest. Miller tried to induce the supposed officer to let him off, and finally handed over his gold watch and a diamond ring. Afterwards he had the imposter, Henry McCord, arrested. The latter was tried at General Sessions and convicted, but the case being carried up, the Court of Appeals in a remarkable decision reversed the conviction.

The prosecutor, said the court, parted with his property as an inducement to a supposed officer to violate the law and his duties; and if in attempting to do this he has been defrauded, the law will not punish his confederate, although such confederate may have been instrumental in inducing the commission of the offense. Neither the law nor public policy designs the protection of rogues in their dealings with each other, nor to insure fair dealing and truthfulness as between each other in their dishonest practices. The design of the law is to protect those who, for some honest purpose, are induced upon false and fraudulent representations to give credit or to part with their property to another, and not to protect those who, for unworthy or illegal purposes, part with their goods.

Judge Peckham wrote a dissenting opinion in which he said:

This statute, it should be borne in mind, is not solely for the relief of the party defrauded. Its purpose is to

punish a public offense, to punish and prevent fraud, and to protect the weak and credulous. Where both parties to a civil suit are equally guilty of a felony, out of which the action arises, the law refuses its aid to either. It leaves them where it finds them. This rule has no application to criminal proceedings; the complainant is no party to that proceeding. The people are the party prosecuting, not the complainant. There is no ground for that rule in a criminal sense, and there is no such rule.

The Appellate Division in 1900, passing upon the conviction of a "green-goods" man, while it was guided by the decision in the McCord case, yet expressed an opinion not unlike Judge Peckham's:

We very much regret being compelled to reverse this conviction. Even if the prosecutor intended to deal in counterfeit money, it is no reason why the appellant should go unwhipped of justice. We venture to suggest that it might be wise for the Legislature to alter the rule laid down in *McCord v. The People* (supra). It is true that there is now in the Penal Code a provision for the punishment of these "green goods" offenders, but prosecution under it seems to be difficult, the only reported case that we know of having been unsuccessful, and that on account of technical defects. If the rule as to larceny by false pretense, and by trick or device, were made the same as the common-law rule that stealing property from a thief is the same crime as stealing from the true owner, we think this class of cases might be much more successfully dealt with. We know that a feeling prevails to some extent in the community that it is unjust that one offender should be punished and his co-offender obtain immunity. The feeling is absolutely unreasonable, where one offender is punished and another escapes, there may properly be a feeling of dissatisfaction, but the dissatisfaction should be not because one man is in prison, but because the other man is out.

Not only has the construction of the law as thus laid down encouraged swindlers along these lines, but it has actually led to the invention of new "games." The "wire-tapping" scheme itself is said, on good authority, to have been invented subsequent to the decision in the McCord case, and designed to come to a nicety within its protection. All that is necessary is to devise some sort of criminal conspiracy, persuade the victim to be a party to it, and there need be no fear of prison.

That a large portion of the public endorses the prevailing interpretation of the law is probably true. "He got exactly what was coming to him," is a common street-corner comment when some countryman has overreached himself in trying to buy counterfeit money or "beat the races." The victim deserves not a particle of sympathy from any one, but if the principle is to be accepted that crimes should be punished only when committed against persons themselves respectable, much more of our criminal law might as well be thrown away.—New York Evening Post.

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

Dr. L. M. Rheem Indulges in Reminiscence.

The reminiscent article referring to old telegraphic days at Omaha, contributed by J. W. Hayes, of Portland, Ore., and published in the April 1 issue, has stirred the memory of Dr. L. M. Rheem, a member of the force adverted to, who now resides at Minneapolis, Minn. The genial doctor, whose vivid recollection and fund of anecdote, casts abundant and pleasant illumination on the personnel of former days of Western telegraphy, in reply to our suggestion, makes a welcome contribution to the literature of the subject. He writes:

"When you suddenly ask a respectable and respected grandfather like myself to turn a flip-flop back through the evergreen aisles of thirty years, there to paint a picture of how we used to do it, you must remember that there is a limit to the old man's strength, and you must make allowance for the inroads of senility, and the magnifying power of a lens thirty years thick. In retrospect there come to me shades, shadows, spirits, faces, incidents and names in much profusion.

"In addition to those named by Mr. Hayes as working in the Western Union office, at Omaha, I recall the two W. H. Murphys, who, on account of the color of their hair, were known, respectively, as "Full" and "Half-rate" Murphy; McMeans, who was in Indiana somewhere the last I heard of him about twenty years ago; R. S. ("Bob") Hayes, now in the freight department of the Burlington road at Omaha; "Rod" Tyler, now in the milling business at Council Bluffs, Iowa; George Nail, who preceded Frank B. Knight as chief operator, and who is now working in the Omaha office; Ewing L. ("Dad") Armstrong, also now in the Omaha office; Charles B. Horton, bookkeeper, now superintendent of the third district at Omaha; Frank J. Burkley, check boy, who afterwards became one of the most finished operators in the West, later leaving the business to establish with his father and brother The Burkley Printing Company, which he is still successfully conducting. Then there were W. L. Reed, Barker, and Linton. Later on in this decade, 1870 to 1880, came Luke Fisher, Tom Curry, chief operator, both of whom I believe have passed away; "Con" Dwyer, also dead; W. B. Hibbard, superintendent, who moved the office from Salt Lake City, dead; Charley Moore, superintendent's clerk, now in Superintendent Horton's office; Frank Crittenton, night chief, who is now division chief in the Western Union office, Chicago; Perry Chamberlain, now in the Postal service, New York city; Edgar Allen, now a prominent and wealthy wholesale grocer of Omaha, and others whose names do not come to me.

"Leaving the Western Union and taking up the Atlantic and Pacific, and its twin brother, the Union Pacific, at Omaha, I remember that a few years previous to Mr. Hayes' advent in

Omaha the repeating office was in the Union Pacific headquarters, where Superintendent J. J. Dickey, L. H. Korty, "Jake" Tallman, who died recently in New York, and the writer made up the day force, "Jake" working the Chicago wire, I the Ogden wire west, while Korty looked after No. 1 Union Pacific, in addition to his clerical work and seeing that Jake and I got to the office on time in the morning, and kept our wires clear. If either of us wanted to go out 'just a minute,' which more often than otherwise meant 'just an hour.' Korty was the 'relief.' I knew then and know now that we used to impose on him in this way, and I want to say right here that I am truly sorry for my part in the imposition.

"This public acknowledgment ought to make Korty feel good, and I hope it will, for there never was and never will be a more accommodating, a more patient, a better friend, counselor and advisor to the operators than L. H. Korty, who deserves more than a simple acknowledgment.

"The night force as I remember it, consisted of 'Ed.' Dickinson, assistant despatcher, whose 'commercial' duty consisted of 'tending' a Wood's button repeater, for late press report. He is another good man for other things besides tending button repeaters; as every one knows he afterwards worked his way by sheer merit to the head of the Greater Union Pacific Railroad system, retiring recently from the road as its general manager. He is now the vice-president and general manager of the Kansas City, Mexico and Orient Railroad, and is to-day just the same 'Ed.' to his old friends as he was thirty-five years ago. I remember his telling me one night when we were speculating on what the future held in store for us, that if he could only get enough of a strangle hold on Fate to induce her to place him in a position where the salary would be one hundred and fifty dollars per month, that he would consider himself 'fixed.' I am satisfied now that he used the choke lock on Mrs. Fate, as he would work just about four to six minutes for that amount of money now, and from what people tell me he would be cheap at that.

"Then there was 'Ed.' Titus, another despatcher, who used to help out on Atlantic and Pacific business; he is now the proprietor of a large patent medicine business in Minneapolis. Just to illustrate the strictness with which lines of authority were drawn in those days, I want to tell you about Titus's dream. We had a sort of a split trick in the office that paid \$85 per month. I forget who worked it, but whoever it was decided to make a move, and left the place vacant. As Mrs. Korty and Mrs. Dickinson were both away on a visit, Korty proposed to Mr. Dickey that himself, Dickinson and I work the trick every third night, dividing the pay equally between us. Mr. Dickey, with his usual good nature, agreed to this, and we started in. I want to say that while this arrangement lasted, that

old repeater was the best tended repeater on record; it had what you might call a supersaturation of tending, as will be seen later. I, as the youngest and handsomest member of the triumvirate, took the trick the first night. Along about one o'clock in the morning I was sitting at the repeater table listening to the Chicago man paste San Francisco, and ruminating on the uncertainties of human life and whether marriage really was a failure or not (I was not married then, but I know now that it is not a failure), when my attention was attracted by a big clod of earth striking me between the shoulders with force enough to nearly knock the wind out of me. The clod had come through the open door at my back, but I could not find the party who threw it, although I made an extended search. I sat down again, and in a minute after I got another jolt. I then found that the throwers were the other two-thirds of the aggregation, who had just dropped round to help me out. They came in and assisted me until 'clear.' The precedent thus established demanded that on subsequent nights the unoccupied members of the trio should tend the man who tended the repeater. This precedent was never violated during the life of the arrangement.

"One night after we had turned the office over to Titus in our usual formal way about two o'clock, we started home. Some one of us had forgotten something, so we went back to get it. We found everything quiet, including Titus, who was sound asleep on one of the tables. It only took a minute and a little careful work to tie him fast to the table without waking him, which we did. Korty, who could imitate the sending of every operator on the despatcher's wire, went into the battery-room and opening the local circuit, began to call 'X,' the despatcher's signal, in a most frantic manner. We made a little noise, which awakened Titus, who made every effort to get loose, without succeeding. Korty then held a conversation between two offices, one of which was telling the other that a passenger train had gotten away from him and that a collision was inevitable unless he could catch 'X,' whom he had been after for over an hour. Titus began to yell for 'Pete,' the night-watchman, who finally came in and released him. He made one jump across the room, answering 'I I X' before he sat down. As the wire was quiet he, after waiting a moment, called up the calling office, which did not answer immediately. When he got the office he asked about the train, and was told that it had left on time and that there was nothing wrong. He asked why the operator had told the other office that he could not raise X, and what about the threatened collision. The operator stoutly denied having said anything of the kind, and further that the wire had been entirely quiet. Titus got up from the table, rubbed his eyes, scratched his head, looked at the clock and then called up the other office, which he

questioned on the same lines, with the same result.

"We were watching him through the window. The expression of his face was alone worth the price of admission. We left him to figure it out himself. The next day he came round to the office quite a while ahead of his usual time. He seemed to have something on his mind, which turned out to be a dream he had had during his daily siesta. He told us the dream, which was the occurrence of the previous night suitably toned to fit the occasion. We agreed with him that it was truly wonderful. It did not take long to publish the dream and Titus finally got the straight of it, which he took good naturedly. He is now a great student of psychological phenomena, and I believe that we gave him his first lesson.

"It is needless to say that you could not hire either Korty, Dickinson or myself to perpetrate a trick of that sort now for less than seven dollars, to be divided equally.

(To be continued.)

The Telharmonium.

If the telharmonium, the invention of Dr. Thaddeus Cahill, of Holyoke, Mass., as described in our previous issue, as its promoters predict, by reason of the ability to transmit its music over telegraph and telephone wires for distances practically without limit, a remarkable electrical achievement will have been accomplished.

The instrument combines in itself the musical power of all the known instruments. It does not, like the phonograph, reproduce music; it makes it and in an entirely new way. The operator plays upon a number of specially arranged dynamos, so connected to the keyboard, which is arranged like that on an organ, that the depression of any given note causes a current in the transmitting wires, which, in turn, produces vibrations in the receivers at the other end of the lines. The person who has the receiver at his ear, therefore, hears the note as if it were actually played instead of as if it had been reproduced.

Dr. Cahill claims for his invention that the combined harmonies that occur in orchestral pieces can be accurately produced by a single performer at the keyboard and transmitted over the wires.

The telharmonium is, of course, an exceedingly complicated and delicate instrument, and the one now in existence is said to have cost \$200,000. This great cost, however, is not considered a difficulty by the backers of this project for disseminating music broadcast over the country, because, it is pointed out, a single telharmonium will be able to supply between 7,000 and 10,000 subscribers.

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

Looking Backward at Salt Lake City.

BY J. W. HAYES.

It was in 1878 and 1879 that the hegira from the Omaha office to Salt Lake City began. N. Courcay Burke was the first to arrive in Salt Lake, where his brother, M. J. Burke, afterwards and for many years American Consul at St. Thomas, Ontario, where he died a year ago, had preceded him. "Bif" Cook was the next arrival, and with him came Eddy J. Fullum, J. H. Largay and George MacMahon. Then followed Homer Grey, Thomas F. Kehoe and Samuel Kelly. A little later on came Edward Beecher, Joe Hurley and Robert Empey.

The rest of the force at Salt Lake at this time was John Henderson, manager, a very affable gentleman, who sought to make things as pleasant as he could for his employees; John Greer was chief operator, John and Alexander Morison, William Greer, C. H. White, Michael Conway, Walter Huey, Frank Brown, with the other contingency I mentioned, completed the office staff so far as my memory serves me. The office was run "wide open," but at no time was there ever any advantage taken of this fact. The two Morison boys went to New York about 1880 and I think are still there. Both were fine operators, and were not lacking in other accomplishments. William Greer was one of the finest senders on the Coast. He is now ranching in Santa Clara county and doing well.

John Greer entered a bank in Deadwood, Dakota, years ago, and now counts his money with seven figures. Michael Conway entered the railway service, and is probably still in the same employ. John Henderson went further west and worked as manager at several important points, finally returning to Portland, Ore., where he is still in the Western Union Telegraph Company's service.

I forgot to mention Ernest W. Emery, who was very much in evidence at the time of which I am writing. He was a great operator and a very companionable young man. He went East about 1879, and is now with The Associated Press in Washington, D.C., as manager of its telegraph department. Superintendent W. B. Hibbard, with Chief Clerk Charles Moore, had their offices on the same floor with the operating room, and both officials were much liked by all the employees. Charles Moore is with the Western Union Telegraph Company in Omaha, and Mr. Hibbard is now dead.

Among the visitors to Salt Lake about this time was Peter Rowe, formerly of Elko, Nevada, who spent a short time there, and then hied to Chicago, where he entered the telegraph service, afterwards achieving fame in the Illinois Legislature. His brother, John Rowe, passed through Salt Lake shortly afterwards, but I have lost track of him. He is smart enough, however, to fill any position to which

he may aspire. Another figure in Utah's metropolis was George E. Millar, who went to Pioche, to Austin and finally to San Francisco, where he became one of the best known commercial men on the Coast. Frank D. Giles, manager at Ogden, now assistant chief operator of the Western Union Telegraph Company's main office in New York, used to run down to Salt Lake occasionally to visit his old friends. C. H. White went East about 1880 and is now manager for the Western Union Telegraph Company at Adrian, Mich.

The Western Union employed but one man in Ogden, which was only a test station for their lines, but was the relay and transfer point for the Atlantic and Pacific Telegraph Company which operated the wires of the Union Pacific Railroad Company, transferring to those of the Central Pacific Railroad Company, now the Southern Pacific, and while the company was known as the Atlantic and Pacific through to the Coast, separate organizations were maintained and checks divided at Ogden. F. D. Giles was manager of the Atlantic and Pacific proper, or Eastern side, with A. B. Hilliker, E. A. Street and Mrs. A. L. Nichols as assistants. George F. Brown was manager of the Central Pacific side, with A. Bruckman and Sam Kimber as assistants. George F. Brown is, I believe, still connected with the Southern Pacific in Ogden. Bruckman is now in San Francisco with the Western Union, and Kimber was in the same city at last accounts, but not in the telegraph business, having retired upon the proceeds of his mining strike in Bodie, and is devoting his time to the collection of rents. Mrs. Nichols has retired, and resides with her son in Washington.

It was about 1880 that the Western Union moved its relay office from Salt Lake to Ogden, and early in 1881 F. D. Giles relieved Mr. Henderson as manager at Salt Lake.

A generation has passed since these young friends were in Salt Lake and vicinity, but each one as he looks backward will feel a pang of regret that the good old times have gone ne'er again to return. A more pleasant and agreeable lot of young men, congenial in every way, would no doubt be hard to find again, and it is pretty sure that one and all admit that their Salt Lake days were among the happiest of their lives.

Senator Dolliver of Iowa tells of a time when he was a school teacher in Ohio and knew two young fellows who between them looked after a small railroad station. One was "Billy" Van Horne and the other was "Charley" Hayes. The former became a telegraph operator, and before ten years was superintendent of the St. Paul road. Now he is Sir William Van Horne, made a baronet because of the wonderful ability he displayed in rescuing the Canadian Pacific from its moribund condition. Hayes is now head of the Southern Pacific.

International Telegraph Tournament at Boston.

BY S. F. SHIRLEY.

An international telegraph tournament is announced to be held in Boston on June 8. There will be the usual speed contests, including one innovation, namely, a "team match," something that has never before been attempted, and there will also be practical demonstrations of all telegraph ideas that can be worked out.

It is the intention of those having charge of this tournament to work out the problems in such a way that it will be as interesting to the public as to the telegrapher. It is an attempt to bring the telegraph closer to the people. Nearly every business in the world has its exposition or fair. They are nothing if not advertising ventures, held with the idea of exploiting their worth to the public. It is just this problem that will be attempted to be worked out at the Boston tournament—exploit the telegraph and bring it more prominently before the people.

It is impossible at this time to announce all of the classes. The "team match," the new idea, will consist of sending and receiving messages, practically a bonus contest. This offers an excellent opportunity for "pairs" to show their ability. Chief Operator F. B. Travis, of the Boston Postal, and Captain Thomas F. Clark, chief operator of the Boston Western Union, are already doing everything in their power to develop fast teams for this event, and advices received from New York indicate that at least one of the New York-Philadelphia teams will enter. There will also be press classes, broker classes, railroad contests, and a special class of contests for women.

Mr. Andrew Carnegie has donated a very handsome cup, to be known as the "Carnegie International Cup, for the Championship of the World." It is of solid silver and stands fifteen inches high with delicate etchings symbolic of the profession.

Mr. Clarence H. Mackay, president of the Postal Telegraph-Cable Company, has contributed four handsome cups as first and second prizes in a team match on message work. This gives a prize for the sending and receiving operator comprising the team making the best and second best records. Several cups and bowls for other events have also been donated.

Cash prizes will also be added for first, second and third winners in each event. Although the list of prizes has not been fully made up, it can be announced that it will aggregate over \$1,000.

The purpose of this tournament, aside from advertising the telegraph, is to create a fund to endow a free hospital bed, and in other ways to assist the members of the profession when necessity arises. The Boston operators now have a bed in the Carney Hospital on which about \$2,100 has been paid. It is the hope of those running this tournament that enough can be realized to pay off the balance of the \$5,000 necessary to acquire full ownership. This bed is held by an association of operators incorporated under the laws of Massachusetts, and is officered by some of the most substantial telegraphers

in the city. They also desire to create a fund that will enable them to do away with the subscription papers. While these subscription papers are a necessity, and are always met with as hearty a response as the telegraphers' means permit, there is no denying the fact that they are numerous, and a fund that can be drawn on in such cases is badly needed.

The list of gentlemen who have consented to act as a board of judges for the tournament include all the officials of both companies in Boston, former telegraphers now high in the newspaper ranks; Superintendents Forristall and Smith, of the Boston and Maine Railroad, as well as the most representative operators from the largest banking houses in Boston. Their names are a high endorsement of the tournament.

The gentlemen having charge of the tournament are: James J. McGarty, president; Charles F. Edney, vice-president; S. F. Shirley, secretary and P. T. Haggerty, treasurer. The executive committee consists of P. J. Stewart, Manchester, N. H.; P. J. Bell, Bangor, Me.; W. M. Laird, M. J. Reidy, C. A. Hart, Fred Dixon and Hon. James B. Clancy, Boston. Further particulars can be had by addressing the secretary, P. O. Box 1271, Boston, Mass.

A Growing Evil.

There seems to be a regrettable tendency among a class of so-called electricians to appropriate that which does not rightly belong to them, says "Electricity," of New York. We refer to certain men capable of stringing a wire and connecting up a bell who deliberately place the letters E. E. after their names, presumably with a view to instilling confidence into prospective clients.

If a man opens an office and hangs out an M. D. sign and has not the proper credentials to entitle him to mend broken limbs he is immediately prosecuted and stands a good chance of being sent to jail as an impostor. Why, then, should a man who has not earned the degree of E. E. be allowed to appropriate a title which does not belong to him and be allowed to practice in peace a profession of which he is in reality not a member?

As we all know it takes usually four years of hard study to possess these two little letters E. E., and why therefore should a man who has taken a correspondence school course or learned a few things electrical in a factory or shop be allowed to coolly appropriate the title without a word being raised in protest.

He is not only taking something which does not belong to him, but he is deceiving the public as well, and some leading scientific body, such as the American Institute of Electrical Engineers, should make it its business to look up and expose all such cases.

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

Wire Ordinance in Minneapolis.

George T. Raymond, wire inspector of the city of Minneapolis, Minn., has drafted the following ordinance to govern the construction of overhead wires in that municipality:

Owners of existing overhead wires or underground conduits must file plans of the same with the city engineer within six months after the passage of the ordinance. Service wires must be properly insulated and line wires must be covered with weatherproof paint, and such wires shall not pass over roofs or under sidewalks except within the block where distribution pole is situated. No wires shall cross alleys or streets diagonally from distribution pole to buildings, but must span the space horizontally to buildings and follow wall surface of building up or down. All poles must bear name of owner, and on joint pole lines different companies must use separate crossarms, each arm to be painted a different color for purposes of identification. High-potential wires on roof fixtures must be differentiated from other wires by special insulation to signify that they are dangerous to human life. Wire network in congested districts to be eliminated by substituting underground conduits or aerial cables for groups of wires entering buildings from terminal poles. It is also the intent of the ordinance to compel wire companies to use striped special insulated coverings on high-potential wires. A penalty of a fine of from \$10 to \$100, or imprisonment not to exceed 90 days, is to be imposed for violations of the ordinance.

The Chicago and Milwaukee Telegraph Company

Editor TELEGRAPH AGE:

The misfortunes of the Chicago and Milwaukee Telegraph Company, the short independent line, connecting the exchanges of the two cities, and relying mainly upon its Board of Trade business for support, appear to multiply. The Associated Press, which has maintained a leased wire service over this line, on March 1 severed its relations with this company. As this move entails considerable financial loss, it cuts a big hole into the earnings of the concern. It is said that the management of the line, since it passed from the control of the receivership on November 1 last, has been far from satisfactory, the statement being made that it is not directed by a practical telegraph element; that apparatus and equipment generally has been allowed to deteriorate, and that the best use of what facilities were at their disposal have not properly been made use of.

It is peculiarly unfortunate that this once valuable property has been allowed to run down. For some time prior to January, 1905, when the company passed into the hands of a receiver, its business had been exceptionally good, thus showing, apparently, that under conservative management the property had value and was capable of holding its own even in the face of the oppo-

sition of the two big companies. How true this may be to-day, in view of the setback the company has received on account of its misfortunes, the recovery from which presents many difficulties, is a question. Certain it is, however, to overcome present unfortunate conditions wise management is imperative. If definite results for good are to be attained, attention should be directed to the proper maintenance of the aerial wires, and not diverted to any thought of submarine or underground construction, such as is said to be engaging some consideration.

A TELEGRAPH MAN.

Chicago, April 6.

An Unsatisfactory Earth Current.

Editor TELEGRAPH AGE:

The experience of the telegraph and telephone companies has developed the fact that it is impossible to get a satisfactory earth connection at Joplin, Mo. The difference of potential between an earth connection at Joplin and one at Kansas City varies between 10 and 25 volts, and between Joplin and St. Louis 10 to 35 volts, causing decided fluctuations in current strength on wires worked to a battery at Joplin. Apparently the soil there is so impregnated with lead and zinc ores, that the return wires of the electric light and trolley leads charge the earth in much the same way as if it were an immense plate of a storage battery cell, and a higher earth current is given out there than from any other point of which I have heard.

It was necessary to run a wire two miles out of town to a creek in order to obtain an approximately good ground, and even then there was an earth current of 5 to 10 volts encountered.

"G."

St. Louis, Mo., April 5.

Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Denver, Colo., June 20, 1906.

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

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

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

International Association of Municipal Electricians meets at New Haven, Conn., on August 15, 16 and 17, 1906.

Magnetic Club, business meeting, meets the second Thursday in January, at New York.

Old Time Telegraphers' and Historical Association meets at Washington, D. C., October 9, 10, 11, 1906.

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

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

Train Despatchers' Association meets at Buffalo, N. Y., in June, 1906.

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

No operator should fail to read TELEGRAPH AGE regularly. It will pay him to do so.

Messenger Boy Law.

A decision affecting the rights of persons employing district messenger boys was handed down April 6 by the Appellate Division, New York. Under it the court holds that the company furnishing the messengers is not responsible for any mistake, loss or misfeasance by the boy.

Morris J. Hirsch sued the American District Telegraph Company, as assignee of Joseph S. Jantzen, on a claim for \$500. The case was tried in the Municipal Court. Hirsch got a verdict for the full amount, which was subsequently affirmed by the Appellate Term. The Appellate Division now reverses this and orders a new trial.

Jantzen, it appeared, in January, 1904, had occasion to send \$500 in cash to the Rutherford National Bank at Rutherford, N. J. He went to the telegraph company's office and asked for a messenger, telling the man in charge that he wanted a trustworthy, careful boy, as the envelope contained \$500. There were no boys present, but in a few minutes the chief of the boys, known as "sergeant," came in, and the operator recommended him to Jantzen.

The messenger went off with the envelope, but the money never reached the bank. What became of it or the boy is not known. Jantzen demanded the money from the company and didn't get it. He assigned his claim to Hirsch, who sued on the theory that the company had contracted to deliver the money by its messenger boy and was therefore liable.

In its opinion the Appellate Division, through Justice Ingraham, says that what the defendant actually undertook to do was to furnish a messenger, and a failure of the messenger to perform the service required was not a breach of contract.

The court, which is unanimous, also finds that the company cannot be held liable on the theory that it was the employer of the messenger and therefore responsible for his negligence or misfeasance. The only question is whether there was a special agreement that the company would undertake to deliver the money as Jantzen wanted it delivered, and the court says there is no proof of any such agreement. The company is merely a general employer, furnishing servants to those who need them for particular work and cannot be held as the direct employer of the messengers. Nor is it a common carrier, says the court, which would make it liable for such losses.

The decision will be appealed.

The Operator and the Adobe Collision.

A writer in the Railroad Gazette, who signs himself "Ex-Telegrapher," has this to say in extenuation of the blunder of the operator on the Denver and Rio Grande Railroad, whose neglect, it has been charged, caused the recent frightful disaster on that road:

"After perusing the editorial in the Railroad Gazette of March 23, the casual reader would be

led to believe that this operator who slept while No. 3 passed Swallows, was a moral derelict who deliberately made himself comfortable, took a good nap and upon awakening was so criminally indifferent to his responsibilities that he told the despatcher that No. 3 had not passed when he knew that there was a possibility if not a probability that it had passed while he was asleep. Thus far there has been no evidence to show that this operator's previous record was not good. Until such evidence is forthcoming it would seem that he should be entitled to a little more charity. There is no one who realizes the awful responsibility which is upon him more than the operator himself—if he is old enough and has had the experience which one in such a position should have. Anyone who has experienced the terrible feeling which a railroad man has (though it be but for an instant) when he erroneously believes he has made a terrible mistake, will never take any chances which might make that state of mind permanent. The shock to the nervous system is something awful and indescribable. It is no wonder that some of the best of railroad employees have become violently insane soon after making such a mistake. An old conductor once said: 'A man suffers the tortures of a thousand deaths in trying to keep awake while doubling the road at night.' This operator was 'doubling' at the time of this wreck. Any operator who has ever done this at night will tell you that it is quite possible for one to go to sleep sitting bolt upright at his sounder, sleep several minutes and awaken again without realizing that he has been asleep at all. It is quite possible that this was the case with the operator in question, as there was a snow storm at the time, which would do a great deal towards muffling the noise of the slowly moving No. 3."

Government Telegraph Line Will Be Sold.

Bids have been asked for by Lieutenant J. S. McCleery, chief signal officer of the department of the Colorado, for the sale of seventy-three miles of government telegraph line between Price and Mytton. This line has not been used since the building of the Utah road from Mack to Dragon, Utah. Prior to the opening of this railroad the government hauled its supplies over the wagon road from Price to Fort Duchesne and built the telegraph line at that time. The distance from Price to Duchesne by wagon road is eighty miles. The distance over the Mack-Dragon railroad is sixty-four miles. All government stores are now diverted via the railroad, which also has a telegraph line to Duchesne. As a result there appears to be no use for the old military telegraph line from Price to the fort in question.

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

Perfect Phillips' Code.

BY GEORGE W. CONKLING.

I submit herewith a specimen of Phillips' Code contractions. The matter is in its original phraseology, which appeared as a recent editorial in the New York "Sun," excepting a few substitutions. It should be considered by those familiar with the subject, an unusually fine example, being almost wholly made up of one-word abbreviations, and to lovers of good receiving code, this will appeal strongly.

With an intelligent sender, matter of this sort can be transmitted at the rate of fifty-five words per minute, with but very little effort, and at the same time reduce the strain on the receiver to a minimum.

Two, three and four-word contractions are very popular among code operators, but they should not be used in the midst of numerous one-word abbreviations, as they tend to demoralize the receiver for an instant, or until he can "line up" on increased speed.

The intent of Mr. Phillips was to give a system of abbreviations to the sending operator which would net certain results with the least possible effort on the part of the sender. I am sorry to admit that some operators use the code the same as spelled-out matter—disregarding all pretense at judgment or space. It is a fact that a general complaint is heard among operators to the effect that but very few have ever taken the pains to learn how to discriminate against obscure and confusing abbreviations. This fault is bad enough, but when coupled with a failure to space uniformly it becomes positively irritating and produces nothing but breaks and worry.

To attain perfection in the transmission of Phillips' Code, to my mind, is the pinnacle of the telegraph profession and operators should look upon it as something more than merely memorizing a score of abbreviations, similar to a school-boy's spelling lesson.

There has also been a tendency of late to introduce all kinds of "mongrel" code, in fact, anything which can be abbreviated phonetically. This may have been Mr. Phillips' idea, but where do we put the peg in? There should be some rule to govern transmission, because if this loose method continues indiscriminately, it is safe to say that it is only a question of time when we will have no code. My friends, especially Mr. A. P. Velie, the reviser of the present book, will, I think, agree with me that the present list of contractions is sufficient and should be followed faithfully.

In conclusion, I would say that the specimen attached hereto represents substantially the arrangement of abbreviations for transmission, omitting nothing except the first word of a sentence, spelling out words which have no abbreviations and using "n" for words ending with "tion"

and "g" for words ending with "ing," which is one of the unwritten laws.

One f ms Intg dypms d pl histroy f ex US is t skm in var stas to el ex Sars bl dl pop vo.

The lpc o sh a cng mst crny be cdrd a rvy mvm be f xty alteratns wh wb efd d fjo o ou gvt. ad ts bcm ad xty d cou.

The six y term o ex Sars wl. oko. wrk aga a ex Sa eld pecy bl pop vo fm beng a pop bdy sim to t exs Hu of Reps. There wl aso b aarl tdn. es cams to cal w. bt it wb lkd tt a ex Sa was mems ad b eld geny. as crn ex Sars r nw. wd b a dft ex Sa fm tt knpd bl t fjs o ts gvt eat mkrs f ex Xn. It wd b a ex Sa was eln one f xnl cks upn ral es qk pop actn hdb abnd. es b less f ck upn t ex Hu wh lw intended to b.

These cdns r. hvr. ntg nu. They hrb tkn up es dsd wnv It hb ppod to and t ex Xu ftp o chug ex Sars bl pop vo. The Intg fac is nw tt in sm stas t xnl pvn ft eln o ex Sars bl xgrs wl bcm a fvb wheel d gvt coach.

Mems o ex Cgs rptg und cv emms o eno cap wo krp xgn lfo thr adhts wl emb aga ay emt to t crpns. bt cujx es dtmd efo qpt peo f sq stas wl efy dmz ay osn.

One of the most interesting developments in the political history of the United States is the scheme in various states to elect Senators by direct popular vote. The importance of such a change must certainly be considered a revolutionary movement because of the extensive alterations which will be effected in the foundation of our government, should this become adopted extensively in the country. The six-year term of Senators will, of course, work against a Senate elected practically by popular vote from becoming a popular body similar to the House of Representatives. There will also be senatorial tradition and customs to calculate with, but it will be indicated that a Senate whose members should be elected generally, as certain Senators are now, would be a different Senate from that contemplated by the founders of this government, and the makers of the Constitution. It would be a Senate whose election one of the constitutional checks upon radical and quick popular action had been abandoned, and be less of the check upon the House which it was intended to be.

These considerations are, however, nothing new. They have been taken up and discussed whenever it has been proposed to amend the Constitution for the purpose of choosing Senators by popular vote. The interesting fact is now that in some states the constitutional provision for the election of Senators by legislatures will become a fifth wheel in the government coach.

Members of Congress representing under cover combinations of enormous capital who corrupt legislation in favor of their adherents will combine against any embarrassment to the corporations, but courageous and determined effort on the part of the people of the separate states will effectually demoralize any opposition.

Iron Wires Being Substituted for Copper.

The Postal Telegraph-Cable Company is now improving its wiring through districts where winter storms and sleet are likely to interrupt communication. In mountainous districts and also in valleys in the eastern part of the United States, the sleet and rain frequently collect on the wires and freeze. Then the wires break under the additional weight. The Postal company uses copper wire almost exclusively, but at exposed points in these districts iron wire is being substituted. The tensile strength of the iron wire being so much greater than that of copper, there is less liability of breakage. Where the iron wire is being installed the number of poles is also being doubled.

At exposed places on the Allegheny mountains where the iron wire has been substituted for copper, and the number of poles increased, there has not been a single breakdown during the past two winters. This change in wire is only in the nature of an experiment, but thus far it has proved to be a good one. At the same time the conductivity of the wires has not suffered to any appreciable extent.

TELEGRAPH AGE should go regularly to every one interested in the telegraph. Write for a sample copy.

The New Vice-President of the New York Telegraphers' Aid Society.

The election of Herbert C. Worthen on March 27, as vice-president of the New York Telegraphers' Aid Society, places in that position a very capable member of the younger element in the telegraph profession. Mr. Worthen was born at Shelby, N. C., July 22, 1877. Left an orphan at an early age, he learned telegraphy at the Oxford, N. C., Masonic Orphan Asylum, of which institution he was an inmate, afterwards entering the telegraph service of the Seaboard Air Line Railway, December 5, 1890, at Clay, N. C. Here he remained filling successively promotive places, until May 23, 1898, the last two years of his stay working as relief train despatcher. Subsequently he passed several months at Washington, D. C., with the Western Union Telegraph Company, but since August 8, 1898, he has been in the employ of that company in New York, with the exception of about a year passed with the Laffan



HERBERT C. WORTHEN.
Vice-President of the New York Telegraphers' Aid Society.

Bureau of the New York Sun, and a few months in the train despatcher's office of the Atlantic Coast Line Railroad at Richmond, Va. During the time he has been with the Western Union company he has been in charge of their interests at the Tribune office, and has held, respectively, the positions of traffic chief of the Southern and Eastern divisions and wire chief of the Southern switch, while at present he is the Southwestern wire chief, in each instance serving his company with credit.

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

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

LETTERS FROM OUR CORRESPONDENTS.

[Advertising will be accepted to appear in this department at the rate of five cents a word, estimating nine words to the line, announcements to be enclosed with a border and printed under the name of the place of the advertiser. The special local value attached to advertising of this character will be apparent. Our agents are authorized to solicit advertisements for these columns, and further information on this subject may be obtained on application.

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 constitute the legitimate contents of all letters. And we wish that our correspondents would avoid the too frequent habit, at all times a bad one, of abbreviating words in writing. This is a peculiarity among telegraphers, we know, but what may be plain to the writer, and for local interpretation, is usually a mystery to the editor, and is apt to lead to error in the printed statement.]

SAN FRANCISCO, POSTAL.

Fourth Vice-President C. C. Adams, of this company, of New York, accompanied by his wife, spent several days in this city recently. Mr. Adams is on a tour of inspection of the larger Postal offices on this Coast. He was accompanied to Portland and Scattle by General Superintendent L. W. Storrer.

Mr. Edward Reynolds, auditor of this company, of New York, was also a recent visitor. Mr. Reynolds was accompanied by Mrs. Reynolds.

Mr. Gus Ericson, construction foreman, died here on March 16, after but a few days' illness.

On March 1 our Seattle local was made a bonus wire. E. F. Welker and Miss Beede take care of this circuit.

William McCandlish has been placed in charge of the Postal interests at the "Examiner" office, vice Frank Howard, transferred to the main office.

John Ufford has been changed to the night trick to look after the traffic.

George Crouch is with the Hearst newspapers, here.

J. J. Murphy and W. E. Collins have resigned.

George Davie and Miss O'Connor are late appointments.

Walter Huey, of New York, was a recent visitor.

PHILADELPHIA, POSTAL.

After a long term of hustling work on "A" New York wire, during which time he made and broke the record for the greatest number of messages handled, Mr. Al. Weiss has resigned to accept a position with the Western Union. Mr. A. Goldberg is creditably filling the vacancy thus created by Mr. Weiss's retirement.

Assistant Traffic Chief Harry Thompson meets some pretty hard propositions at times. In connection with regular routine work he found his troubles augmented the other day in his efforts to meet the usual requirements, while being handicapped by the absence of ten men.

The following named are new arrivals: G. I. Haur, from Pittsburg, and M. Ruberg; Mrs. C. C. Figg from the Western Union, this city.

Mr. Robert Robinson, of Lancaster, Pa., always makes it a point to visit his telegraphic friends when

in Philadelphia, among whom he is always welcome.

Owing to the absence of a regular night man, Manager Roy L. Massey of the Broad street station office, found himself obliged to work very long hours, alternating afterwards with Mr. Leo Miller, until a permanent incumbent should be appointed. Mr. Leon Embly, who fills the newly-created all-night operatorship at this office, is doing well.

PHILADELPHIA, WESTERN UNION.

Mr. Charles Henry Beckwith, assistant transfer agent, was married a few days since to Miss Florence Rosabelle Warwick. Numerous telegraph friends of the groom attended the ceremony.

Late arrivals include: Messrs. Holland, Layton and O'Neill, from the Postal company; Mr. Seeley from Egg Harbor, N. J.; Mr. Willis from Trenton, N. J.; Mr. Lieberman, from Philadelphia; Mr. Almes from the Philadelphia, Reading and Pottsville Telegraph Company, and Mr. F. G. Pratt from Elkton, Md.

The recent death of the wife of H. Hamburg, manager of the branch office at 529 Arch street, elicited many expressions of sympathy on the part of his telegraph friends.

CHICAGO, WESTERN UNION.

Chief Operator L. K. Whitcomb has been absent on sick leave.

The east and west switch boards have been burished up, and present a much improved appearance.

Frank Plain, who has been assisting Messrs. Gales and Eshman in the quadruplex room nights, has been promoted to the east board, nights.

Mr. Walter Omeliah, an old time operator, formerly of this office, known to the theatrical world as Walter McCullough, played at the Garrick Theatre, St. Louis, recently, with marked success.

John L. Cassidy, of Minneapolis, has a rival in the character sketch field, in the person of D. F. Taylor, a recent arrival at Chicago, who is cartooning ludicrous local situations. Mr. Taylor promises to become an artist of note and probably his telegraph career will be short.

E. M. Lusk, of the repeater department, has returned from a trip south. Miss Annie Costello is now assisting Mr. Bassett, the claim clerk.

Frank Donaldson of the loop switch, is sick at home. He hopes soon to report for duty.

Edward Lavery is now working in team with William Dunn on the Omaha bonus wire.

Mr. and Mrs. L. D. Seavey, of Omaha, are now located here.

Stanley Wooster of the Armour company, is now working in this office.

MONTREAL, GREAT NORTH WESTERN.

Mr. Moore, former day traffic chief, has been appointed to succeed Mr. R. E. McCord, recently resigned as night chief operator. When Mr. McCord retired he was presented with a purse of gold by the staff as a token of the high esteem which they held for him. He has ac-

cepted a position of superintendent with the De Forest Wireless Telegraph Company, as announced in the April 1 issue of TELEGRAPH AGE. Mr. Stainton, an operator, succeeds to the position made vacant by Mr. Moore's promotion.

CINCINNATI, WESTERN UNION.

The following are late arrivals at this office: Miss Kate E. Specker, Mr. John A. Walker, Mr. Robert Dudley, Mr. A. C. Bennett, Mr. H. A. Whitehead, Mr. J. P. Quiggins, Mr. Harry Brown, Mr. Chas. Miller and Mr. Robt. H. Caldwell.

ST. LOUIS, WESTERN UNION.

The bonus wires are now being worked in teams, and are arranged as follows: Dallas, R. C. Johnston and C. E. MaLett; Chicago, B. F. Ragsdale and W. F. Thomas, G. B. Godfrey and A. J. Mackler; Kansas City, Charles Rapp and F. W. McConoha.

Mr. Ray Alger, one of the wire chiefs, will be married to Miss Virginia Kaut on April 17.

Miss Adele Kaut has left here to take a position in the office of George D. Barnards, vice Miss Virginia Kaut, resigned.

Among the new arrivals are: A. H. Faulkner, W. B. Hill, H. J. Forman, P. P. McGrory, F. W. Farrier, Jr., R. T. Ward, E. E. Hooper, P. A. Miller and J. F. DeWitt.

The telegraph clerks' baseball club will play with the broker operators April 22, at Forest Park.

NEW YORK, WESTERN UNION.

A Last Appeal to the Generous.

This is an invitation to you to be present at the big smoker Friday evening next, April 20, at Manhattan Lyceum. The cause is a worthy one. You or some of your friends may be a beneficiary of this fund at some future time, although I hope not. Valuable prizes to those holding lucky numbers. Please apply to me for tickets, which are 50 cents.

D. A. MAHONEY.

Mr. Robert Logan, formerly of the Eastern division, now with the Anglo-American Telegraph Company, was the winner of a \$25 prize given last week by one of the evening papers, having anticipated to a nicety the correct ending of one of their stories.

Messrs. W. A. Eberts and George L. Marshall have returned from an extended vacation which took them to Denver and Salt Lake.

Mr. J. E. Robinson from the Elizabethport, N.J., testing office, has been assigned to the Southwestern switch.

The baseball season having opened in this city, Mr. R. J. Murphy as usual is in charge of the office at the polo grounds.

Among recent visitors were: Manager C. K. Hunt, of Winsted, Conn., accompanied by his son-in-law, William Strong; also J. G. Purple, former-

ly of this department, and at present engaged in the real estate business.

Mr. M. T. Durkin, assistant wire chief, Western switch, has resigned to accept a position under the government.

Mr. L. D. Grace has been transferred from the quadruplex department to the Western switch, Mr. W. T. Cowardin going to the quadruplex department.

Miss S. P. Coxon of the Western ways has resumed duty after a three-months' absence, following the death of her mother.

Mr. Walter C. Burton, formerly of this department, but now engaged in other business, returned recently from a trip to the Pacific Coast.

NEW YORK, POSTAL.

John J. Whalen, the promotion of whom to be assistant day manager of the Postal, was mentioned in this column April 1, is a native of Long Branch, N. J., where he was born June 11, 1872. At ten years of age he began during his school vacation to serve as a messenger for the Western Union Telegraph Company in his native place. Later he entered the employ of the Baltimore and Ohio Telegraph Company, and rose grade by grade until he became assistant day manager. He first entered the service of the Postal company in May, 1892. In November, 1896, he became a member



J. J. WHALEN, BECOMES ASSISTANT DAY MANAGER.

of the New York police force, appointed thereto by Theodore Roosevelt, then police commissioner. His term as a policeman was of short duration, for in the following February, 1897, he returned to the Postal employ as wire chief. He was appointed night manager January 1, 1900, and in October of that year rendered conspicuous service in protecting the company's property at the time of the fire originating in the Hardware Club, located on the fourteenth floor of the Postal building. For this action he received the thanks of the company and was rewarded by an increase of salary.

Daniel F. Mallen, until recently assistant night manager, and whose advancement to the position of night manager in place of J. J. Whalen, pro-

moted, was announced briefly in this column April 1, will have completed twenty-two years of service with the Postal company this year. Mr. Mallen began his telegraphic career as a messenger for the Atlantic and Pacific Telegraph Company in Jersey City in 1876, afterwards serving the Western Un-



D. F. MALLEN. BECOMES NIGHT MANAGER.

ion Company first in that city and later in the main office, New York. His experience acquired in the various departments of the Postal service, during which he long held the position of general traffic chief, has been varied, affording him an excellent grasp of the requirements of the general run of the company's business, well qualifying him to discharge the duties of his present post.

Watch the Mecograph demonstrators at the "Big Smoker" Friday evening next. Get your tickets from Mahoney. You may draw one of the many prizes.

The twelfth floor gossip at present is all about the coming "smoker" at Manhattan Lyceum, corner of Sixty-sixth street and Fourth avenue, on April 20, to be given by the Commercial Telegraphers' Union. The Actors' Union and other local unions are contributing to the success of this affair. There is a select vaudeville programme, and an exhibition tournament of fast telegraphing on the bill.

Mr. Wilbur O. Eastlake is back on the Washington bonus after quite a serious illness.

S. A. Coleman, traffic chief, has been transferred to the switchboard.

J. E. McCarter has resigned.

The arrivals are: D. C. Murphy, H. A. Mosher, E. A. McManus, W. W. Wilson, H. N. Wiley, R. Waterbury, E. H. McFadden, V. C. Frost and G. O. Heath.

OTHER NEW YORK ITEMS.

Thirty-eight messengers in a down town telegraph office, New York, went out on strike a few

days ago because they had been forbidden to smoke cigarettes while on duty. To prevent a tie-up of business the manager gave in and withdrew the order.

Mr. M. J. O'Leary, secretary of the Telegraphers' Mutual Benefit Association, recently undertook a trip to Mount Clemens, Mich., for the purpose of accompanying Mrs. O'Leary, who is to remain at that resort for a month, taking the baths for the benefit of her health.

The Magnetic Club, of New York, will hold its spring meeting and dinner at the Hotel Astor, Broadway and Forty-fourth street, on Tuesday evening, April 17, the hour appointed being half past six o'clock. A number of prominent ex-telegraphers are expected to be present.

The friends of Mr. John Brant, secretary of the Old Time Telegraphers' and Historical Association, will be glad to hear that he has so far recovered his health as to be able to resume his duties at his office, where he may now be seen almost daily.

Book Notices.

"The Telegraphist's and Telephonist's Note Book" is the final outcome of a purpose in bookmaking long entertained by its English author for the handy requirements of employees in the telegraph, telephone and railway services. Its contents cover a wide range of subjects of interest to the classes named, inasmuch as it presents solutions of problems met with in every-day practice. Price seventy-five cents. For sale by J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

"Wireless Telegraphy" is the title of a bright little volume of 174 pages that has just made its appearance in England, written by William J. White, of the engineer-in-chief's department of the general post office, London. The author has gone into his subject with evident care, and the discussion of wireless telegraphy and of the several systems now in vogue are invested with much interest. The volume contains fourteen chapters and eighty-six illustrations. Price seventy-five cents. For sale by J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

The twelfth edition of that standard work of Abernethy, on commercial and railway telegraphy, theory and practice, including railway station and express service, arranged on the plan of questions and answers, more than maintains its previous reputation. Revised and enlarged, it affords an excellent study of the telegraph both in its commercial and railway aspects, a guide and help to workers in this broad field of the telegraph of the utmost importance, for the general subject is handled with a minuteness and intelligence rarely reached. The enlarged volume contains 424 pages, and is fully illustrated. Price \$2.00, which includes express delivery charges. Address orders to J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

Canadian Pacific Telegraphs Increases its Facilities.

The telegraph department of the Canadian Pacific Railroad will, during this year, largely increase its wire facilities.

The principal new work to be undertaken, as announced by James Kent, manager of the Canadian Pacific Telegraphs, is as follows:

A copper wire will be erected from Montreal to Winnipeg, which will be worked duplex; this will make four duplex circuits in use between these points; a copper wire from Montreal to Toronto, worked quadruplex; this will make four quadruplex wires between these cities, in addition to the railroad and way wires. An iron wire from Montreal to Ottawa, worked quadruplex, in addition to one now in use. A cable will be laid between Prescott and Ogdensburg for railway service. A heavy iron wire will be erected between Brandon, Man., and Strassburg, Sask. A copper wire between Minnedosa, Man., and Sheho, Sask. Two iron wires from Reston, Man., to Brandon, Man. A heavy iron wire from Brandon, Man., to Regina, Sask., via Arcola.

A copper wire will be erected from Revelstoke to Ashcroft, and an iron wire thence to Vancouver, completing the third duplex wire between Winnipeg and Vancouver; the construction of a pole line carrying two wires between Guelph and Goderich, Ont.; the construction of a pole line carrying two wires, on the new Toronto-Sudbury route; the construction of a pole line and one wire over the new railway branch between Reston, Man., and Wolsely; pole line carrying one iron and one copper wire along the extension of the railway from Sheho, Sask., west; east of Saskatoon a new pole line carrying three iron wires; west of Saskatoon a pole line carrying two iron wires, and from Daysland (near Edmonton), east, two iron wires; pole line carrying two iron wires from Strassburg west; pole line with one wire over the extension from Winnipeg Beach to Ginli; pole line with one wire over the extension north from Teulon, Man.; pole line with one wire on the extension of the Lauder branch.

In all there will be a total of 610 miles of new pole line, and 4,068 miles of wire, 1,966 miles of which will be copper.

In addition to this new work there will be a large amount of reconstruction and general overhauling of the older lines. The company expects to finish this work, now just begun, by early autumn.

Interesting Telephone Figures.

President Frederick P. Fish in his annual report of the American Telephone and Telegraph company just issued, shows that there were 2,528,715 Bell Telephone stations in operation at the close of 1905, an increase of over half a million,

or about 25 per cent. since the close of the previous year. The total mileage of wire in use for exchange and toll service was 6,043,518 miles, of which over a million and a quarter miles were added during the year. During the year the Bell companies spent for new construction in exchanges and toll lines \$46,603,516, and for land and buildings \$4,177,390, a total of over fifty million dollars, as against \$31,619,100 in 1904. During the year the Bell companies handled a total daily average of 13,911,000 connections, or at the rate of about 4,479,500,000 a year, being 54 telephone calls to each man, woman and child in the United States.

The American Bell system of the United States now exceeds in number of subscribers, mileage of wire and the extent of traffic the telephone systems of Great Britain and continental Europe combined.

Mr. Fish says that it is the duty of the company to employ the best business methods, to adhere to their conservative capitalization, to continue to establish and maintain the highest practicable methods of efficiency and to give every portion of the public as far as possible the class of service it requires at the lowest rates consistent with a proper return on the investment.

The Telegrapher's Despair.

Julian Hawthorne as an author is the delight of the printer, but as a newspaper correspondent he is the telegrapher's despair, says the Saturday Evening Post. This is all for the same reason. Mr. Hawthorne writes slowly, carefully weighing each word before he sets it down, and, when he does set it down, forming it in characters so small and upon lines so close together that the process of reading it becomes almost as dilatory as that of writing it. As, of course, the manuscript is typewritten when it is intended for a book or magazine, this method of composition is all very well for the printer, since the author's original deliberation guarantees but few corrections in the typewritten "copy" and still fewer corrections in the proofs. But the meat of the printer becomes the poison of the telegrapher when Mr. Hawthorne happens to be writing news reports for a daily paper and having them sent over a wire. Then it is the original "copy" which goes to the operator, and the more pressing the necessity for speed, the harder becomes the task of meeting the demand.

On one occasion half a dozen newspaper men, among whom was Hawthorne, were all at a small New Jersey town on the same assignment. By seven in the evening all their "copy" had been filed with the single operator, and the whole of it should have been sent and the wire "clear" by ten o'clock at the latest. But at 10.30 one of the reporters happened in at the telegraph office and found the operator still at his instrument.

"What, not through yet?" asked the reporter.

"Naw," growled the telegrapher; "I've been workin' on nuthin' but this here Hawthorne mes-

sage since seven o'clock, an' if there's a hundred more words of it I reckon I won't git through before twelve, nuther."

Whereupon the other reporters held a council of war and sent their "stories" by long-distance telephone.

London, Ont.

(Communicated.)

About half way between Buffalo and Detroit, London is situated on the Thames River and surrounded by the rich farming country known as "The Garden of Canada." London is decidedly a manufacturing city as well as an agricultural center. The electric power to be brought from Niagara Falls will serve to increase the importance of London as an industrial city. There are now over two hundred factories in operation at this point, many of them having branches in the leading Canadian cities. London is no less an educational center, there being located there, among other institutions of learning, the Western University and the Provincial Normal School. With its exclusive connection with the Western Union Telegraph Company, the Great North-Western Telegraph Company offers the public telegraph facilities equal to any city in the United States or Canada. Reaching three cable stations and all the important cities of Canada, communication can be had with upwards of 49,000 places in Canada, the United States and Mexico.

The North American Telegraph Company.

Organized 1886.

GENERAL OFFICES, MINNEAPOLIS, MINN.

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

CLINTON MORRISON,
President.

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

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

Exclusive direct connection with the telegraph lines of the Minneapolis, St. Paul and Sault Ste. Marie Railway Company.

Telegraph Notes From Unknown Europe.

Primitive as we are accustomed to supposing the east coast of the Adriatic to be, the network of telegraph is fairly complete, and in Istria, at every railway station, as in America, the operator is installed, writes Felix J. Koch, in "Sound Waves." There, and in Montenegro, like the post office, the telegraph is a government institution. Even little Montenegro has its wireless telegraph system, owned by the Prince himself, at Antivarri, when the grand cordon of Montenegro was conferred upon Signor Marconi.

At Budapest, in Hungary, the newspapers, one and all, publish the same telegrams from outside, and such a thing as a "scoop," or "beat," is unknown. Hence, much of the necessity for haste in journalistic telegraphing, that is so apparent with us, is there obviated.

Even the higher Carpathians, in the vicinity of Schmecks, have now been connected by telegraph with the greater centers. In Roumania the telegraph and the post office are conceded by the poverty-stricken people to be about the only exemplary institutions of the government.

From Belgrade, Servia, the frequent regicides make cable tolls to the press agencies an important factor in the telegraph offices, though strict censorship obtains.

TELEGRAPH AGE has helped many a telegrapher in his career. It will help you. Price, \$1.50 a year. Send for a free sample copy.

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

For Sale.—A new Yetman transmitting typewriter; practically has never been used; \$70. W. C. Graves, 210 Girard Trust Building, Philadelphia, Pa.

Rubber Telegraph Key Knobs.

Price fifteen cents, reduced from twenty-five cents. No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. This renders the touch smooth and the manipulation of the key much easier. Remit in one or two-cent stamps and address

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

TYPEWRITERS New and Second-Hand

On easy monthly payments. Typewriter supplies of all kinds. Renting and repairing a specialty. Send for catalogue and price list.

CENTRAL TYPEWRITER COMPANY

Postal Tel. Bldg., Chicago. 22 E. Mitchell St., Atlanta, Ga.
O. T. Anderson, Pres. - W. L. Gilbert, Manager

THE Canadian Pacific R'y Co's Telegraph

Executive Offices, Montreal
JAS. KENT, Manager

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

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

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

The Postal Telegraph-Cable Company of Texas.

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

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

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

BOOKS ON THE TELEGRAPH.

ABERNETHY, J. P.—The Modern Service of Commercial and Railway Telegraphy, in Theory and Practice, including the Railway Station and Express Service; arranged in Questions and Answers; \$2.00.

CREHORE, ALBERT CUSHING, PH. D.—Synchronous and Other Multiple Telegraphs. Some methods of obtaining independent telegraph circuits on a single wire, both with and without synchronism. 124 pages; 42 illustrations; working diagrams; \$2.00.

CROCKER, F. B. AND WHEELER, S. S.—The Practical Management of Dynamos and Motors. Has a special chapter by H. A. Foster. Contents: Descriptions and Directions; Examination, Measurement and Testing; Localization and Remedy of Trouble in Dynamos and Motors; Arc Dynamos and Motors requiring special Directions. Illustrated; \$1.00.

HASKINS, C. H.—The Galvanometer and its Uses. \$1.50.

HOBBS, W. R. P., AND WORMELL, R.—The Arithmetic of Electric Measurements. \$0.50.

HOUSTON, E. J.—A Dictionary of Electrical Words, Terms and Phrases; 980 pages; 582 illustrations; \$7.00.

HOUSTON, E. J.—A Pocket Dictionary of Electrical Words; leather; \$3.00.

JONES, WILLIS H.—Pocket Edition of Diagrams and Complete Information for Telegraph Engineers and Students. This standard work has been carefully revised and 74 pages and 30 diagrams added, including full descriptions of the newest apparatus lately adopted by the Western Union and Postal Telegraph companies. It presents the finest study of the complex subject of the telegraph ever published; it explains clearly the equipment of a modern telegraph office, and is a text book that no student, operator, engineer or official, no matter what his grade, can afford to be without; 334 pages, 52 chapters, 160 illustrations; \$1.50.

LOCKWOOD, T. D.—Electrical Measurement and the Galvanometer and its Uses; 144 pages, fully illustrated with diagrams of connections, engravings of apparatus, etc. \$1.50.

LOCKWOOD, T. D.—Electricity, Magnetism and Electric Telegraphy; A Practical Guide and Handbook of General Information for Electrical Students, Operators and Inspectors; 376 pages; 152 illustrations; \$2.50.

LYNDON, LAMAR.—Storage Battery Engineering; 360 pages; 178 illustrations and diagrams; 4 large folding plates; \$3.00.

MARSHALL, PERCIVAL.—A. I. Mech. E. Small Accumulators; How Made and Used; an Elementary Hand-Book for the Use of Amateurs and Students; \$0.50.

MAVER, WM., JR.—American Telegraphy and Encyclopedia of the Telegraph. This fine work, revised and enlarged, treats of the systems, apparatus and operation of telegraphy; 656 pages; 490 illustrations; \$5.00.

MAVER, WM., JR., AND DAVIS, M. M.—The Quadruplex. This standard book treats its subject in a most thorough manner. Its chapters are: Development of the Quadruplex; Introduction and Explanatory; The Transmitter, Rheostat and the Condenser; Stearns's Duplex; Instruments of the Polar Duplex; The Polar Duplex; The Quadruplex; The Dynamo Electric Machine in Relation to the Quadruplex; The Practical Working of the Quadruplex; Telegraph Repeaters; The Wheatstone Automatic Telegraph; 128 pages; illustrated; \$1.50.

MEADOWCROFT, WM. H.—A B C of Electricity. This book begins at the very root of electrical science, and contains a vast amount of useful information; \$0.50.

MEYER, FRED L.—Twentieth Century Manual of Railway and Commercial Telegraphy. This work embraces all kinds of commercial messages, train orders, phrases, etc.; 249 pages; illustrated; \$1.00.

MONELL, DR. S. H.—The Cure of Writers' Cramp, and the Arm Troubles of Telegraphers. This valuable treatise should be in the possession of every telegrapher suffering from this common annoyance; \$0.50.

OFFICIAL DIAGRAMS OF THE POSTAL TELEGRAPH-CABLE COMPANY'S APPARATUS AND RULES GOVERNING THE CONSTRUCTION AND REPAIR OF LINES; 134 pages; 105 full-page illustrations; \$0.50.

PHILLIPS, WALTER P.—Phillips Code. A popular, generally used and thoroughly tested method of shorthand arranged for telegraphic purposes, and contemplating the rapid transmission of press reports; also for general newspaper and court reporting; flexible leather cover, pocket size; \$1.00.

PRIME, S. IRENAEUS.—Life of S. F. B. Morse. The only work authorized by the family and executors of the great inventor, compiled from original data. This is the finest, most accurate and complete life of Prof. Morse, and includes the history of the invention of the telegraph and the many important business connections with those who were interested with Prof. Morse in the development of the telegraph, that has ever emanated in any shape or at any time from the press; sheepskin; 775 pages, illustrated. The regular price of \$6 has been reduced to \$3.

POPE, FRANKLIN LEONARD.—Modern Practice of the Electric Telegraph; a Technical Hand Book for Electricians, Managers and Operators; 234 pages; 185 illustrations; \$1.50.

PREECE, W. H., AND SIVEWRIGHT, J.—Telegraphy. A description of every telegraph system and apparatus used in the English telegraph department; \$2.

PRESCOTT, G. B.—Electricity and the Electric Telegraph; 8th edition; 2 volumes; \$7.

REID, JAMES D.—The Telegraph in America. A complete detailed history of the telegraph, including the organization of the various telegraph and cable companies; 804 pages; illustrated; full morocco binding. Reduced from \$7.00 to \$5.00.

SCHNEIDER, N. H.—Electrical Instruments and Testing; 210 pages; 100 illustrations. Cloth, \$1; full limp leather, \$2.

SCHNEIDER, N. H.—Model Library, comprising 4 books, viz.: Study of Electricity for Beginners; Dry Batteries; Electrical Circuits and Diagrams; Electrical Bells, Alarms, etc.; bound in 1 volume; cloth, \$1.

SMITH, E. W.—Electricians' Manual of Diagrams; 93 pages; \$0.50.

TALTAVALL, JOHN B.—Telegraphers of To-day. Biographical and historical sketches of more than 900 leading telegraphers, living and dead; 354 double-column pages, 7½ x 11 inches; gilt edges; imitation morocco binding; only work of the kind; of much practical value to those who would keep in touch with the personnel of the profession; reduced from \$5 to \$1, express charges collect.

THOM, CHARLES, AND JONES, WILLIS H.—Telegraphic Connections; Embracing Methods in Quadruplex Telegraphy and other Apparatus; 20 plates with circuits distinguished by three different colors; \$1.50.

WEBER, W. L.—Handy Electrical Dictionary; 224 pages; 32 illustrations; cloth, \$0.25; leather \$0.50.

WILKINSON, H. D.—Submarine Cable Laying and Repairing; \$5.

YOUNG, J. ELTON.—Electrical Testing for Telegraph Engineers; \$4.

TELEGRAPH SKETCH BOOKS.

LIGHTNING FLASHES AND ELECTRICAL DASHES.—A book made up of bright, ably written stories and sketches, telegraphic and electrical, that should find a place in the home of every telegrapher; 160 large double-column pages; profusely illustrated; reduced from \$1.50 to \$1.

PHILLIPS, WALTER P.—Sketches, Old and New, by the author of Phillips Code, containing a number of telegraph stories, told with all the charm of that delightful story writer; 200 pages; illustrated; \$1.

BOOKS ON WIRELESS TELEGRAPHY.

BOTTONE, S. R.—Wireless Telegraphy and Hertzian Waves; diagrams and illustrations; \$1.

COLLINS, A. FREDERICK.—A Short History of Wireless Telegraphy, its Theory, Experiments and Results Obtained; 300 pages; 332 illustrations; \$3.

FAHIE, J. J.—A History of Wireless Telegraphy; third edition, revised; illustrated; \$2.

TOBACCO TAGS

(PAPER BACKS)

From the following Brands of

PLUG TOBACCO

Are GOOD for PRESENTS

- | | | | |
|------------------|---------------|-----------------|-------|
| "Horse Shoe" | | "Spear Head" | |
| "Master Workman" | "Old Honesty" | "Pick" | |
| "Razor" | "J. T." | "Eglantine" | "Ivy" |
| "Sailor's Pride" | "Jolly Tar" | "Granger Twist" | |

Also RED TIN TAGS (Paper Backs) from
 "Tinsley's 16-oz. Natural Leaf"
 and
 W. N. Tinsley's Picture Tags

This Offer Expires November 30th, 1906

SEND TAGS FOR PRESENTS TO

PREMIUM DEPARTMENT

The American Tobacco Co.

JERSEY CITY, N. J. SAN FRANCISCO, CAL. ST. LOUIS, MO.

WISE MEN INSURE THEIR LIVES AND PROPERTY.
 WHY NOT INSURE YOUR SENDING SKILL ABSOLUTELY
 AGAINST DETERIORATION AND PARALYSIS BY USING THE YETMAN

TRANSMITTING TYPEWRITER

(TWO MACHINES IN ONE)

A modern, up-to-date, labor saving, **KEYBOARD SENDING DEVICE**,
 And a completely **VISIBLE-WRITING TYPEWRITER FOR RECEIVING**.

A COMPLETE "KIT OF TOOLS" FOR THE TELEGRAPH OPERATOR

A single touch transmits the Morse signal for every letter and every figure.
 No exhausting physical effort. No nervous strain.

YOU FURNISH THE BRAINS,
 THE TRANSMITTING TYPEWRITER DOES THE REST

Of course you use a Typewriter.

Why not use The Transmitting Typewriter,

And, in SENDING as well as RECEIVING,

Employ your PRESENT KEYBOARD SKILL?



Size (Inches), base 11 x 13 1-2, height 11
 (Smaller than an ordinary Typewriter)

All modifications and improvements, so called, on the out-of-date, nerve-destroying hand key, require a special skill for manipulating, and, even under the most favorable circumstances, can afford only a partial or temporary relief.

THE TRANSMITTING TYPEWRITER, with its keyboard touch, gives PERMANENT relief, and enables any intelligent operator quickly to become an expert, and to send absolutely perfect Morse easily and rapidly, with one-tenth the labor.

It is the only mechanism that with a single touch transmits the complete Morse signal for every letter, thus entirely doing away with the constant nervous and muscular strain of hand sending.

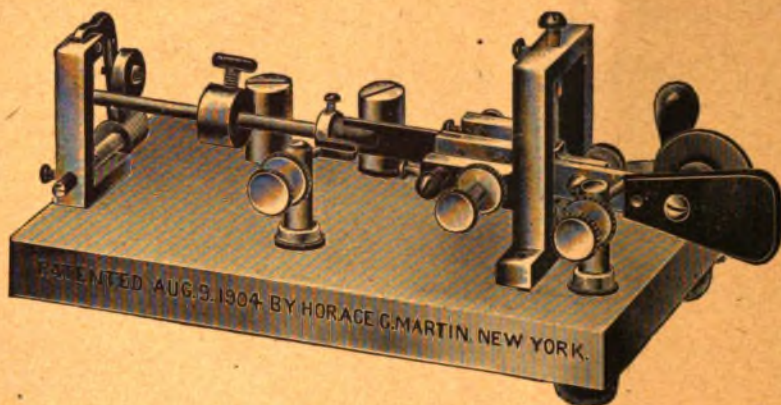
Price only \$125.

Also sold on easy Monthly Payments.
 Special Ribbons at standard prices sent post-paid.
 Write now for Catalog, full particulars and
 convincing testimonials to

Yetman Transmitting Typewriter Co.

ST. PAUL BUILDING - - 220 BROADWAY - - NEW YORK.

MARTIN'S VIBROPLEX The Perfect Transmitter



Operated without a battery; embodies all of the essential features of Martin's famous Auto-plex.

Scientifically constructed, it will carry on the longest of circuits.

Its signals can instantly be made light or heavy, slow or fast.

Its touch is easy and elastic, and adjustable to suit the sender.

IT IS EASY TO LEARN— A PLEASURE TO USE.

If you have lost your grip—
If it tires you to work the Morse key—
If you have a heavy, exacting sending trick—
If you wish to send perfect Morse at any speed,

You Need a

VIBROPLEX

For it makes the dots.

Write for circulars containing description and testimonials.

UNITED ELECTRICAL MANUFACTURING CO., Inc.

53 Vesey Street

New York

Official Diagrams of the Postal Telegraph-Cable Company's Apparatus and Rules Governing the Construction and Repair of Lines

We now have ready for delivery a book entitled "Official Diagrams of the Postal Telegraph-Cable Company's Apparatus and Rules Governing the Construction and Repair of Lines." The volume contains 134 pages, including 105 full-page diagrams; size 7 x 4½ inches.

Fourteen pages are devoted to Rules governing the construction and repair of telegraph lines; and four to the subject of standard tools. Submarine cable splices, underground cable splices, single-wire joints and aerial cable splices are also fully treated. Under the general head of Rules for Wiring Offices and Cable Boxes, the subjects of the terminal office, intermediate offices, submarine and underground cables, aerial cables, call circuits and call boxes, leased wire offices, branch offices, miscellaneous, are fully given. Then come rules for the care of motors and generators, explanation of and rules for the care of the Callaud battery, rules for the care of the Leclanche battery and resistance coils, following which is the table of Size and Insulation of Wire Cable for interior use, and that of Wire Gauges.

The authority to publish this fine work by TELEGRAPH AGE, exclusively, was granted by Mr. William H. Baker, vice-president and general manager of the company, the stipulation being that the price shall be restricted to but fifty cents a copy.

This is done primarily in order that the employees of the Postal company may enjoy the benefit of a low charge, for to them the book may be said to be practically indispensable; the price, however, will be the same to all purchasers alike.

This nominal price for so large, important and complete a work, embellished with so many first class plates, made especially for it, makes the book a valuable acquisition to any library; in fact, it is indispensable to every telegraph and electrical student. The book contains diagrams of the Phantoplex system, the latest development in the telegraph art. All of the engravings are made from the official blue-prints of the company, and are therefore absolutely correct.

All orders should be addressed to

J. B. TALTAVALL, Telegraph Age

Remit by Postal or Express money orders.

253 BROADWAY, NEW YORK

.....THE.....

Western Union Telegraph Co.

EXECUTIVE OFFICES, 195 BROADWAY, NEW YORK

ROBERT C. CLOWRY, *President and General Manager*

The Largest Telegraph and Cable System in the World

1,125,549 MILES OF WIRE;
24,434 OFFICES.

SEVEN ATLANTIC CABLES

Connecting North America with all Points
in Europe and Beyond.

Including two cables of the American Telegraph and Cable Company, four cables of the Anglo-American Telegraph Company, and one cable of the Direct United States Cable Company.

DIRECT WIRES to GALVESTON, TEXAS, connecting at that place with the Cables of the MEXICAN, the CENTRAL and SOUTH AMERICAN TELEGRAPH COMPANIES for

ALL POINTS IN MEXICO AND CENTRAL AND SOUTH AMERICA,

DIRECT WIRES and CABLES to HAVANA, CUBA, connecting at that place with the CUBA SUBMARINE and WEST INDIA AND PANAMA TELEGRAPH COMPANIES for

ALL POINTS IN THE WEST INDIES.

Domestic and Foreign Money Orders by Telegraph and Cable.

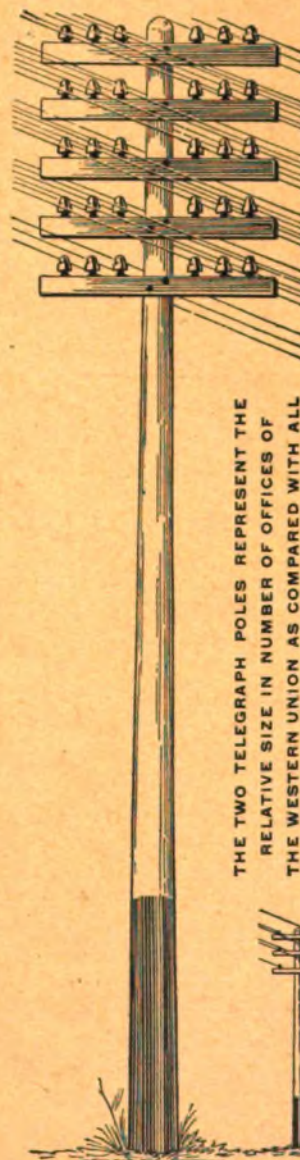
EXCLUSIVE CONNECTION WITH THE
GREAT NORTH-WESTERN TEL. CO. OF CANADA

OFFICES IN GREAT BRITAIN:

General Offices: **252 Gresham House, Old Broad Street, London, E. C.**

T. W. GOULDING, General Superintendent

40 Mark Lane, London, E. C.	Backhall Chambers, Baldwin street, Bristol.
21 Royal Exchange, London, E. C.	29 Gordon street, Glasgow.
Hays' Wharf, Tooley street, London, S. E.	10 Forster Square, Bradford
109 Fenchurch street, London, E. C.	1 Panmure street, Dundee
The Baltic, St. Mary Axe, London, E. C.	50 Frederick street, Edinburgh
Effingham House, Arundel street, Strand, London, W. C.	Exchange Buildings, Leith
2 Northumberland avenue, London, W. C.	31 Brown street, Manchester
3 Rumford street and Cotton Exchange, Liverpool.	1 Side, Newcastle-on-Tyne



THE TWO TELEGRAPH POLES REPRESENT THE
RELATIVE SIZE IN NUMBER OF OFFICES OF
THE WESTERN UNION AS COMPARED WITH ALL
OTHER COMPETING COMPANIES COMBINED

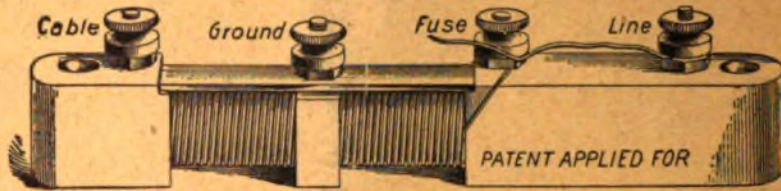
W. U. T. CO. OTHER COS.
24 634 4,868
OFFICES OFFICES

THE ARGUS LIGHTNING ARRESTER.

New Principle

New Design

New Results



Always Ready
No Carbons to Clean
No Plates to Adjust
No Ground to Clear
But Ready Just the same for the next Storm.

Lightning of any degree interrupted without grounding or disabling the line. Thousands in use last season. Not one case of loss of Instruments or Cables protected by THE ARGUS ARRESTER.

MADE BY **FOOTE, PIERSON & CO.** *Manufacturers of Electrical Goods,*
82-84 FULTON ST., NEW YORK.

ATLANTIC INSULATED WIRE & CABLE CO.
WIRES AND CABLES.

FOR SUBMARINE, AERIAL, UNDERGROUND
AND INTERIOR USE.

FACTORY
STAMFORD,
CONN.

120 LIBERTY STREET
NEW YORK CITY.

TELEGRAPH,
SIGNALS,
TELEPHONE,
LIGHTING,
RAILWAY.

Received Only Medals Awarded World's Fair, Chicago, 1893.

COVERING INSULATED WIRES AND CABLES

FOR
Aerial, Underground, . . .
Submarine and Interior Use.

KERITE TAPE.



FOR
Telephone, Telegraph, Power and Lighting.

W. R. BRIXEY,
MANUFACTURER.

203 BROADWAY, NEW YORK.

MANUFACTURED AT
SEYMOUR, CONN.

Catalogues, Samples and Prices on Application.

AMERICAN TELEGRAPHY:

SYSTEMS,
APPARATUS
OPERATION

500 Diagrams, 665 Pages, 34 Chapters.

By **WILLIAM MAVER, Jr.**

Bound in Cloth, . . . \$5.00

Sent, express charges prepaid, to any part
of the world upon receipt of price.

J. B. TALTAVALL,

Telegraph Age,

253 Broadway, New York.

Please mention Tele-
graph Age in communi-
cating with advertisers.

THE WESTON STANDARD VOLTMETERS AND AMMETERS.



The Weston Standard Mill-Ammeters and Ammeters are infinitely superior to galvanometers for tests of current strength on lines and for tests of Relays, Sounders and other Telegraphic Apparatus. They are direct-reading, dead-beat, and are practically uninfluenced by the earth's field. No constants are required, and, with careful use there is no necessity for recalibration. The Weston Standard Voltmeters are the very best practical instruments obtainable for determining the electro-motive force of single cells, or series of cells, or for ascertaining the voltage on lines. By the proper use of these instruments all tests of resistance, current, strength and electro-motive force required in telegraphic practice can be made with great ease and accuracy. Correspondence solicited.

WESTON ELECTRICAL INSTRUMENT COMPANY,

Main Office and Works: **WAVERLY PARK, NEWARK, N. J.**

LONDON BRANCH: Audrey House, Ely Place, Holburn.

PARIS, FRANCE: E. H. Cadot, 12 Rue St. Georges.

BERLIN: European Weston Electrical Instrument Co., Ritterstrasse No. 88.

NEW YORK OFFICE: 74 Cortlandt Street.

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

The Modern Service of Commercial
and Railway Telegraphy (8th Edition,
revised and enlarged) by J. P. Abernethy.
The theory and practice, including rail-
way station and express service. Arr-
anged in questions and answers 425
pages, 40 illustrations. Price \$2.00,
expressage prepaid. Address John B.
Taltavall, Telegraph Age, 253 Broad-
way, New York.