

THE BERLIN PRINTING-TELEGRAPH CENTRAL STATION.

BY DR. ALFRED GRADENWITZ.

On October 1 a most valuable addition to the Berlin telephone service, with nearly 68,000 subscribers, was made when the "Ferndrucker-Centrale" a type-printing telegraph service, was opened to public service.

This printing telegraph as constructed by the Siemens & Halske Co. is similar to the well-known Hughes type printer and the Baudot telegraph. Its distinctive feature is its simplicity. The telegraphing of a letter, figure, or punctuation mark is effected simply by pressing down a key corresponding to the signal in question. The manipulation of the new telegraph may be learned by anybody in a short time. The apparatus is nothing else than a *tele-typewriter*. The keyboard of the printing telegraph is similar to that of an ordinary typewriter, comprising four banks of seven keys each, of which 26 are provided each with a letter on one side and a figure or sign of punctuation on the other. Of the remaining two keys, one serves as a capital key or as a letter shift key, whereas the other, bearing the inscription "figure," serves as a figure or punctuation shift key. By striking either of these keys, the type wheel of the printing telegraph is displaced either for letters or figures in a manner similar to the Hughes apparatus. The apparatus at each end of a line may be used either as transmitter or receiver without any change, both being automatically and simultaneously operated as soon as the first white key, being the blank key, is struck. The apparatus will then become a transmitter.

The typewheel, as shown in the illustrations, is formed with a circle of letters and with a circle of figures and punctuation marks. On actuating the shift-key the typewheel is displaced automatically on its shaft, so as to bring the circular rows of signs mentioned, above the printing surface of the paper ribbon. By actuating an ordinary key on the other hand, the typewheel is rotated far enough to bring the desired type in front of the paper. The latter will be then pressed against the wheel and impressed with the character, return downward instantly, and be moved as far as the interval of two letters ready to receive the next sign. This process will occur simultaneously in both of the machines at the terminal stations, and is automatic in the receiver, no matter whether it is or is not attended by an operator. If the owner of the apparatus be absent, the telegram may be read on the paper ribbon on his re-

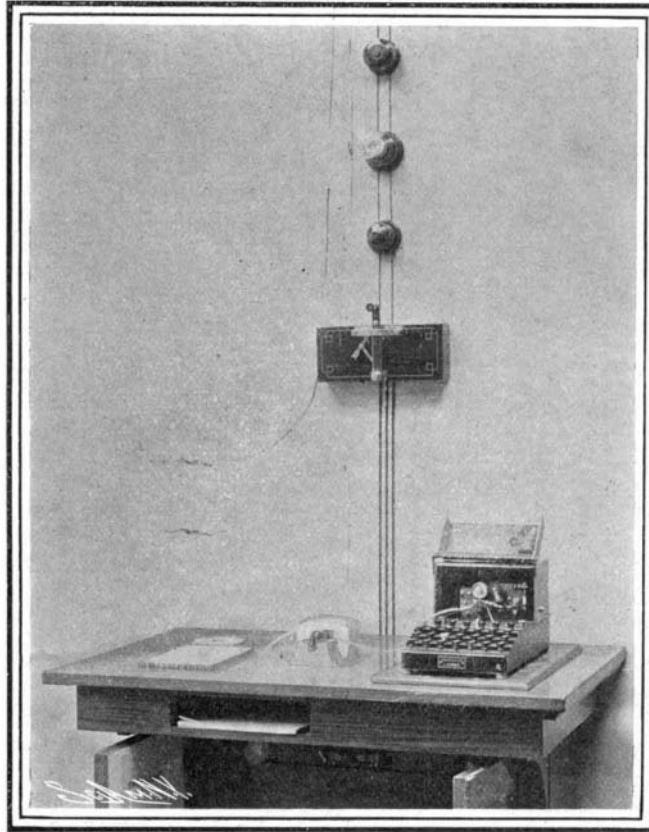
turn. The electric printing telegraph will thus give two perfect records of the same telegram, one on the sending and the other on the receiving apparatus, the transmitter having always at his disposal an evidence of the correctness of his communication so as

telegraph circuits on neighboring telephone circuits. It is thus possible to include both kinds of conductors in the same cable. A small electrometer, driven by the accumulator battery, will at the same time wind up the spring of the apparatus.

A central station, similar as to its arrangement and working to telephone central stations, has been opened at 28 Zimmerstrasse, Berlin, for subscribers. This central station is fitted with a switchboard with indicators (the white shields shown in the upper compartment) and catches (in the compartment below the indicators) for 100 subscribers. Sixteen connecting lines permit the simultaneous connection of thirty-two subscribers so as to enable a simultaneous communication between one-third of all the subscribers when the switchboard is completed. As soon as a subscriber presses down the calling key of his printing telegraph, the annunciator of the indicator-board will drop and an alarm be rung. The official in charge will put himself in communication with the caller in order to ascertain the desired connection through an inquiring apparatus, six of which are reserved for this purpose, and connect both subscribers, so that their apparatus are ready for direct communication. This shows the similarity of service with telephone service. There is, however, in addition, the possibility of connecting any desired number of subscribers to the same printing telegraph, so as to transmit the same communication simultaneously to all the subscribers.

Similar telegraphic services from one central station to a certain number of subscribers simultaneously by "ticker," have for some time been worked in New York, London, and Paris. A similar service has been carried out also in Bremerhaven, Germany, for transmitting ship telegrams from one central station to 100 subscribers in different places. The central station just opened in Berlin is used in addition to the mutual communication between the subscribers, intended to transmit similar information to a certain number of subscribers, limiting the service at first to Exchange telegrams, which are transmitted at given hours from the transmitting apparatus in the Berlin Exchange. The same system of communication could be employed for transmitting telegrams from a central telegraph office to a certain number of newspaper offices.

The city of Valladolid is about to lay down a system of general collectors and surface drainage.



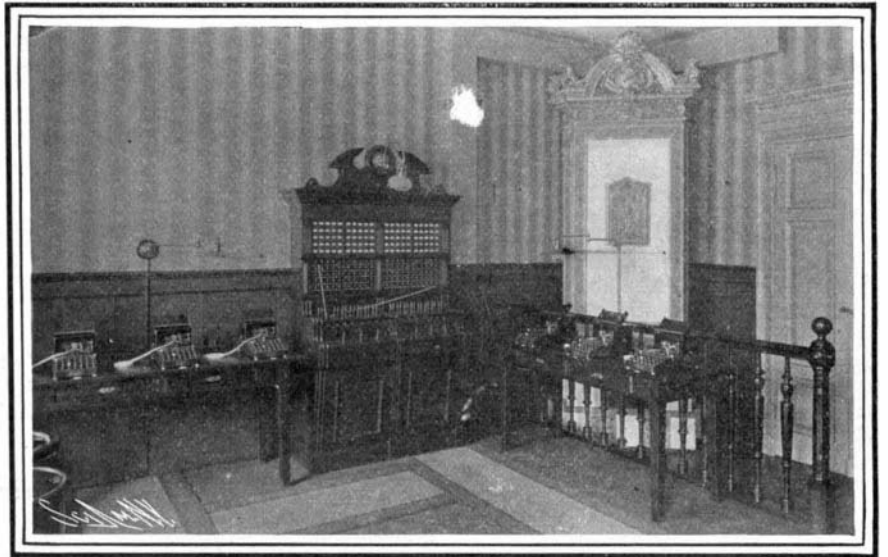
TWO GROUP SWITCHES.

to exclude the possibility of mistake. The typewheel is inked by an inking wheel to the right.

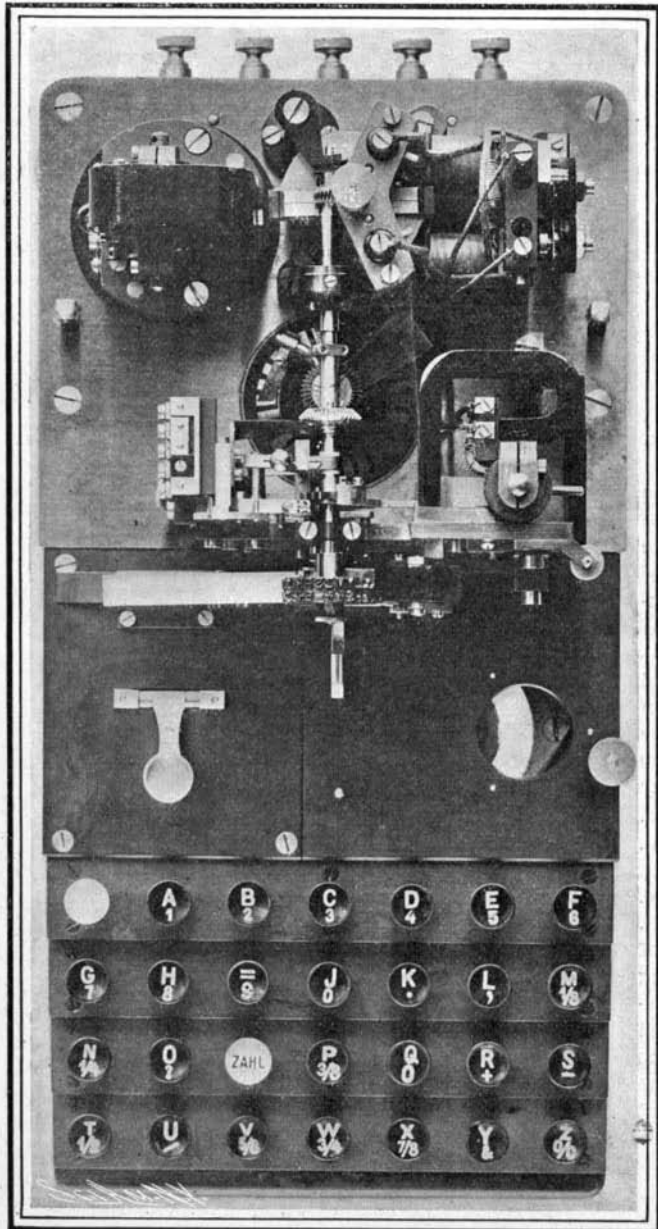
As soon as the capital or initial key is pressed downward, the circuit of the transmitting apparatus is completed. A switching roller is set rotating, which sends electric currents of alternating directions into the printing telegraph circuit and through the line relays connected with the apparatus. Both the transmitting and receiving apparatus will be energized by local currents, which through the medium of relay magnets, cause the rotation of the type wheel from the initial position through the same distance in all stations.

When a letter-key is depressed a peg attached to one end of its lever will strike against the rotating switching inking roller, stopping the latter, and thus the typewheel of the printing telegraph. At the same time the type, levers of both apparatus being attracted, the corresponding letter will be printed. As long as the key is pressed downward, the typewheels cannot move, thus enabling the transmission to take place at any desired speed. After a telegram is transmitted, both the transmitter and receiver will be cut out automatically with a certain position of the type wheel, the apparatus thus being stopped.

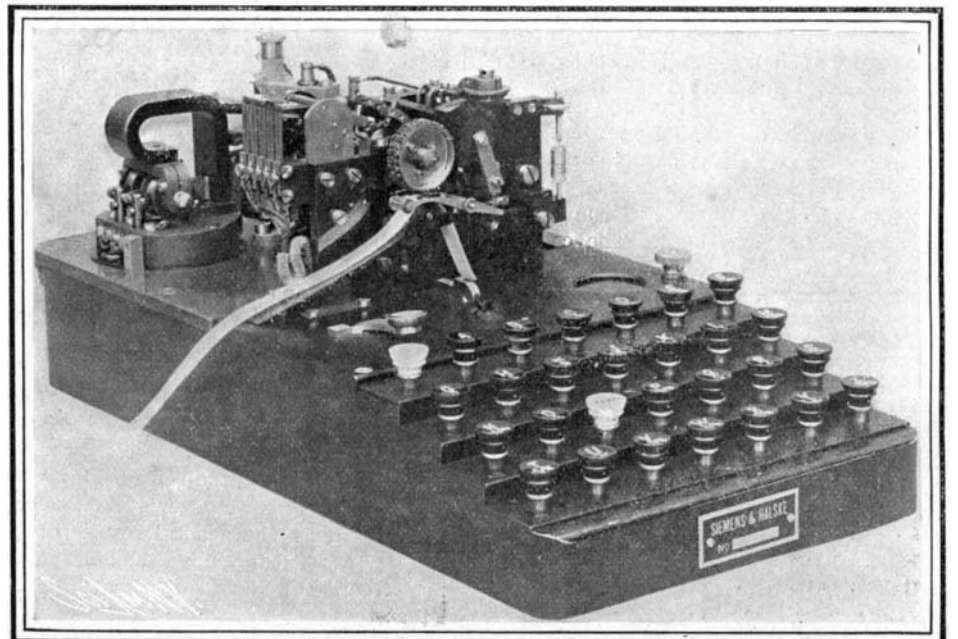
Twelve accumulator cells enclosed in a box, serve as a working battery. The battery is divided in the middle so that either half of the battery only is used in the local or line-current circuit. The tension (12 volts) in the line circuit is so low as to exclude any possibility of an inductive influence of printing



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TOP PLAN VIEW OF PRINTING TELEGRAPH.



PRINTING TELEGRAPH WITH COVER REMOVED.