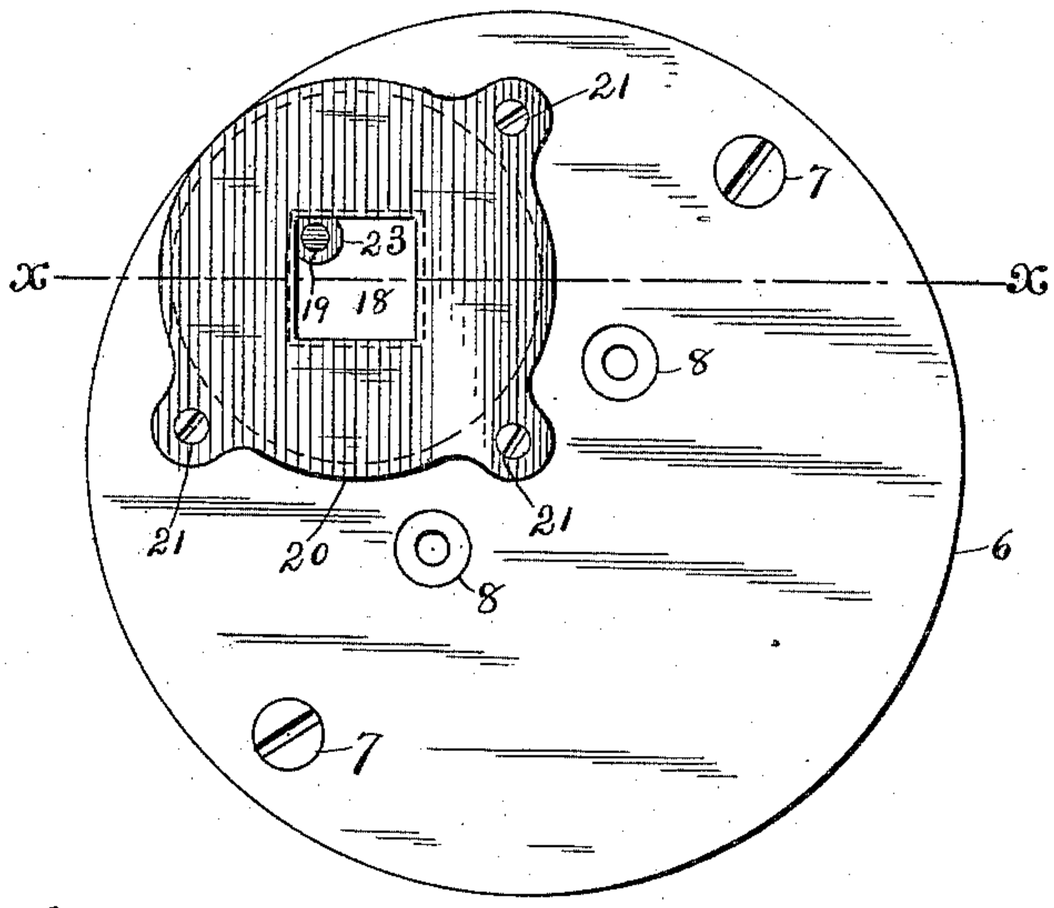
(No Model.) 2 Sheets—Sheet 1.

H. ETHERIDGE.

AUTOMATIC SWITCH FOR AUTOGRAPHIC TELEGRAPHS.

No. 445,716. Patented Feb. 3, 1891.

Fig. 1



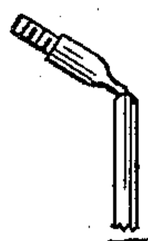


Fig. 3.

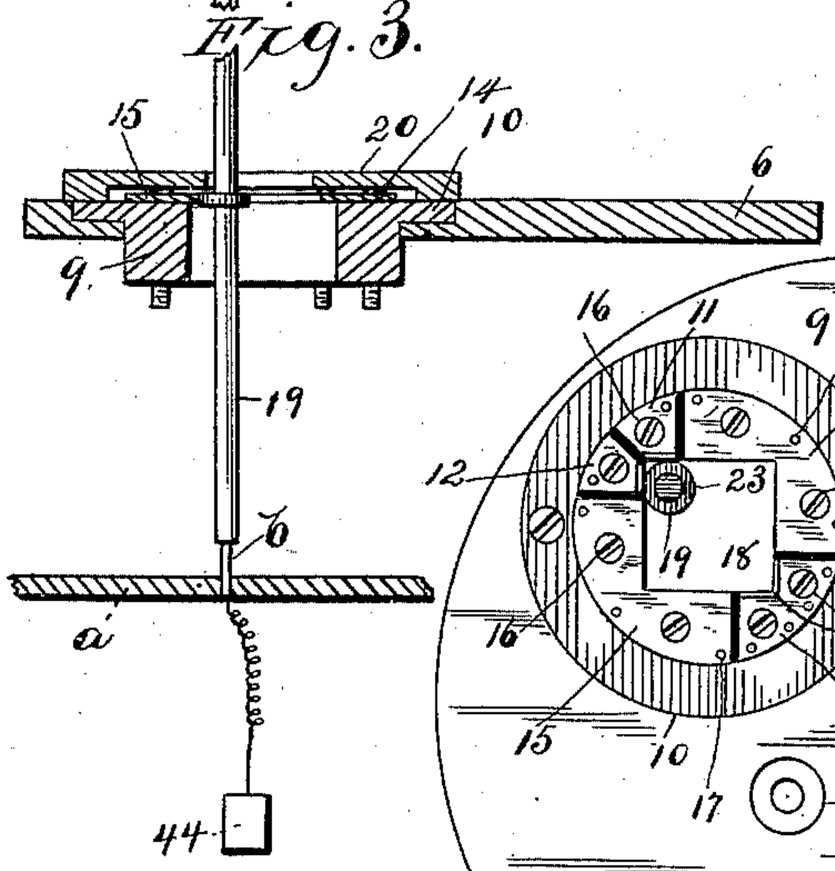
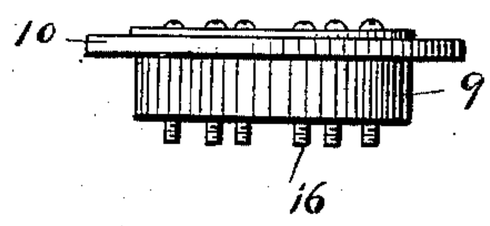


Fig. 4.



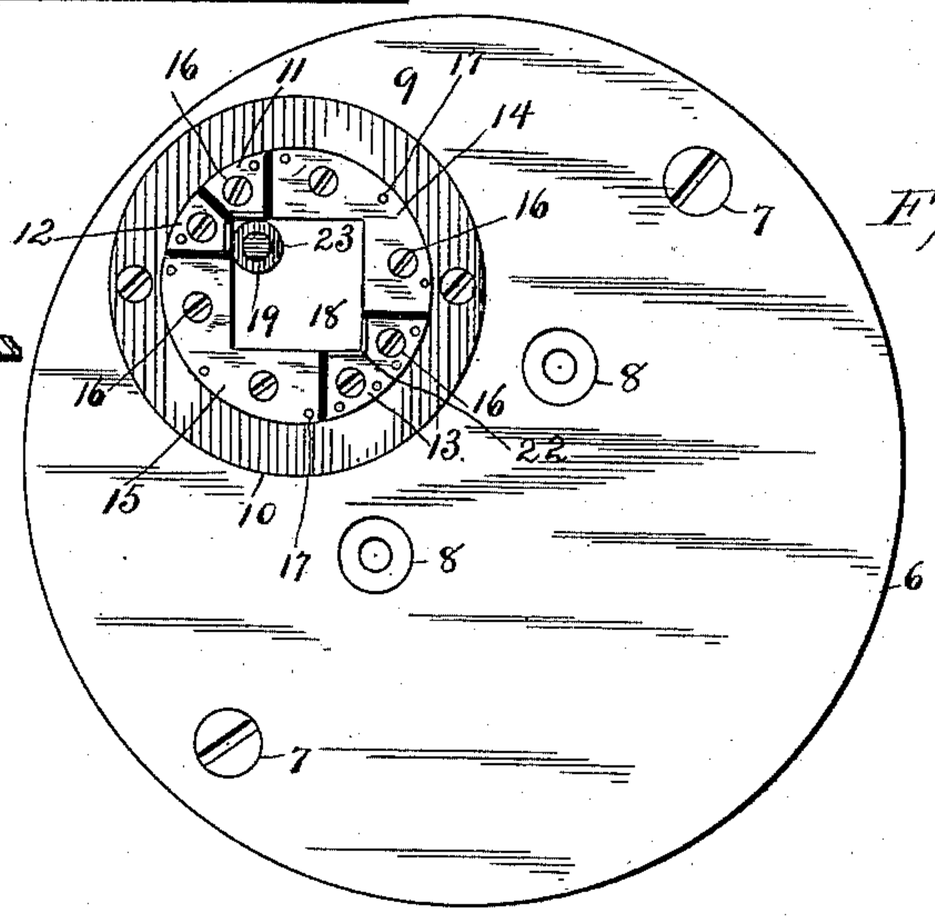


Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 5

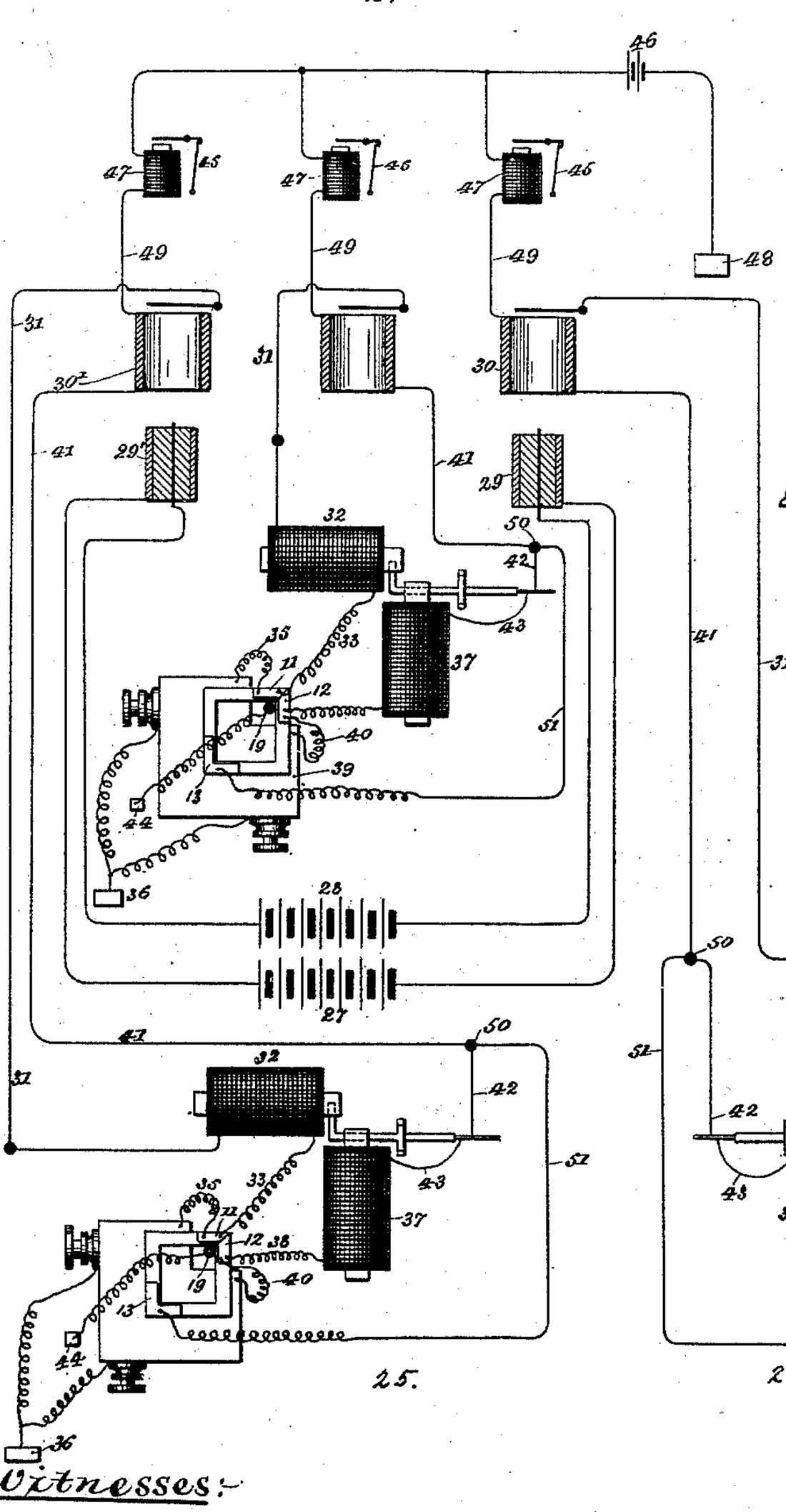
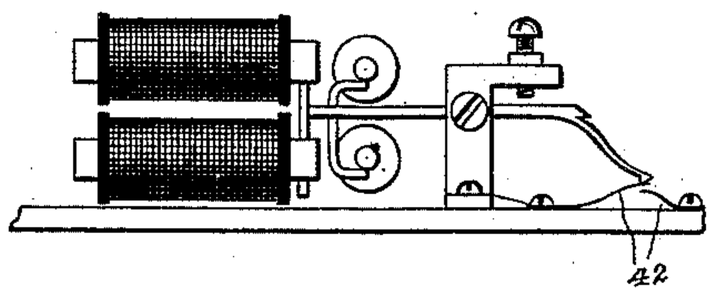


Fig. 6



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UNITED STATES PATENT OFFICE.

HARRY ETHERIDGE, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE WRITING TELEGRAPH COMPANY, OF NEW YORK, N. Y.

AUTOMATIC SWITCH FOR AUTOGRAPHIC TELEGRAPHS.

SPECIFICATION forming part of Letters Patent No. 445,716, dated February 3, 1891.

Application filed October 29, 1888. Renewed July 12, 1890. Serial No. 358,475. (No model.)

To all whom it may concern:

Be it known that I, HARRY ETHERIDGE, a subject of the Queen of Great Britain, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Automatic Switchs for Autographic Telegraphs, of which the following is a specification.

My invention has reference to means for controlling the circuits between subscribers and the central office in an autographic-telegraph-exchange system.

The object of the invention is to devise a switching mechanism which will be automatic in its operation and thereby obviate the necessity for the manual adjustment of the mechanism by the subscriber to make the required connections to throw the transmitter or receiver into or out of circuit.

In carrying out my invention the transmitting-stylus is utilized as a part of the switching means, and in the normal condition of the apparatus the stylus automatically maintains such a relation to the other elements of the switching means as to keep only the receiver in circuit; but when the stylus is moved from its position of rest, when grasped by the hand of the operator to transmit a message, the connections are automatically so changed as to cut in the transmitter, and when the writing has been done and the operator releases the stylus it at once assumes its normal position and thereby cuts the transmitter out of circuit. It is by such an arrangement that I propose to accomplish automatically what heretofore was made to depend upon the intelligence and thoughtfulness of the subscriber.

The invention will now be described in connection with the accompanying drawings, which form part of this description, and the subject-matter for which protection by Letters Patent is desired will be specified at the end hereof.

In the drawings, in which like features are indicated by like figures of reference in the several views, Figure 1 is a top plan view of the supporting-plate for the transmitter, to which certain features of my improvements are applied, and showing the cap 20 in place. Fig. 2 is a similar view with the cap 20 removed. Fig. 3 is a cross-section on the line *x x* of Fig. 1. Fig. 4 is a view in side elevation of the form or block which receives the insulated contact points or pieces of the switch mechanism. Fig. 5 is a view illustrating diagrammatically the application of my improvements to an autographic-telegraph-exchange system. Fig. 6 is a side view of the circuit maker and breaker.

Referring to the drawings, 6 indicates the plate, preferably of brass, which supports the transmitter, and it is held in place by the screws 7 to the box or case (not shown) containing the writing mechanism of an autographic telegraph, with which each subscriber is supplied. The holes 8 are for the purpose of receiving the bolts or rods which secure the transmitter to the plate 6.

Within an opening made in plate 6 there is fitted a form or block 9, of ebonite or other suitable material, for receiving the insulated brass contact-pieces comprising parts of the switching mechanism. The form 9 is provided with a central opening and with a supporting-flange 10, as shown. The insulated brass pieces are five in number, and are indicated by 11, 12, 13, 14, and 15, and they are secured to the form or block 9 by screws 16, which pass entirely through said block, and to insure a firm connection between the parts a number of pins 17 are also made use of, as indicated. When the pieces 11 to 15 are fastened in place around the opening of block 9, they form a central square opening 18, within which the transmitting-stylus 19 is adapted to be manipulated. The cap 20, of ebonite or other suitable material, and having a depression in its bottom to receive the tops of pieces 11 to 15, as shown in Fig. 3, and having also a square central opening corresponding to the opening formed by said pieces, is secured by screws 21 over the top of said form 9 to exclude dust from the insulated pieces 11 to 15. The only purpose that brass pieces 14 and 15 serve is to complete the square 18, and they are insulated from contact-pieces 11 and 12, and also from contact-piece 13, and contact-pieces 11 and 12 are likewise insulated from each other. The interior diagonally-opposite angles of square 18, formed by contact-pieces 11, 12, and 13, are provided with pieces

of platinum 22, as shown, to insure a satisfactory electrical contact between said contact-pieces and the stylus 19, the stylus being also provided with a platinum contact 23 for a like purpose.

Referring now to Fig. 5 of the drawings, which is designed to illustrate the utilization of my invention in an autographic-telegraph-exchange system, 24 indicates the central office, and 25 and 26 two sets of apparatus—including my present improvements—such as subscribers in a district system are supplied with.

The office batteries are indicated by 27 and 28, the battery-plugs by 29 and 29′, and the openings in the switch-board, which receive the battery-plugs, by 30 and 30′. The line 31 connects the central-office switch-board with the magnet 32 of the receiving-instrument, said magnet being also connected by wire 33 with contact 11 of the individual switch mechanism.

The transmitter-section for the receiver-magnet 32 is indicated by 34, the transmitter-sections consisting of piles of carbon disks, as shown and described in patents to James H. Robertson, No. 350,320, dated October 5, 1886, and No. 353,593, dated November 30, 1886, and it is connected by wire 35 to contact-piece 11 and is grounded at 36.

The transmitter-section for the receiver-magnet 37, which latter is connected to contact-piece 12 by wire 38, is indicated by 39, and is connected to contact-piece 12 by wire 40 and grounded at 36, as shown.

Line 41 connects the central-office switch-board with contacts 42, (see Fig. 6,) at which point there will be located a circuit breaker and maker, the latter being connected by wire 43 to receiver-magnet 37. Any suitable construction of circuit breaker and maker may be employed; but I prefer to make use of that construction shown in my pending application bearing Serial No. 255,342, filed in the United States Patent Office November 16, 1887, wherein an arm carrying a pair of armatures is pivoted in such relation to electro-magnets, preferably the receiver-magnets, and contacts corresponding to 42 as to be controlled by said magnets, the circuit being completed by the depression of the pivoted arm when the magnets are energized, and broken by the elevation of said arm when the current is switched off.

The transmitting-stylus 19, besides being pivoted, as usual, in the base-plate *a* of the transmitter, as shown in Fig. 3, is grounded, as at 44. The spring *b* at the foot of the stylus normally holds the latter in contact with the contact-points 11 and 12, as shown in the drawings, so that when the stylus is released by the operator after a message has been written it automatically resumes its normal position, with its contact 23 resting within the platinum-faced angle formed by contact-points 11 and 12.

At the central office 45 indicates the location of the annunciators, 46 battery, and 47 annunciator-magnets connected to the battery 46 and grounded at 48. Wire 49 is connected to the central office switch-board, and also to the line 41, as shown. The line 41 where it is joined to the binding-post 50 has an extension 51, which is connected to contact 13, as shown, and it is brought into play to effect the dropping of the annunciator-shutter at the central office when the stylus 19 is moved over in contact with said contact-piece 13, as presently explained.

From the above description of the construction of the mechanism and the disposition of its various elements the following explanation of the direction of the several currents in the operation of the autographic-telegraph-exchange system herein illustrated will be readily comprehended.

In Fig. 5 of the drawings both sets of apparatus 25 and 26 are in condition for receiving my switching instrumentalities automatically, maintaining the receivers in circuit. If the subscriber controlling apparatus 26 desires to call up the central office, he takes hold of his transmitting-stylus 19, and moving it away from contacts 11 and 12 brings it for a moment in contact with contact-point 13 and then permits it to resume its normal position in contact with points 11 and 12. The momentary contact of stylus 19 with contact-piece 13 causes the annunciator-shutter at the central office to drop, the circuit being completed through the stylus 19 to effect that result, as follows: Beginning at ground 48, to which battery 46 is connected, the circuit is through annunciator-magnet 47 and wire 49, thence through line 41 to binding-post 50, and through wire 51 to contact-piece 13, and to stylus 19 to ground 44. Upon receiving the signal communicated in manner just explained the central-office attendant plugs in the subscriber calling, another office-battery plug being in or may be put in the office connection to the office instrument, and said subscriber is then enabled to communicate with the central office, the circuits being as follows when thus communicating: From the ground of the central-office instrument and through said instrument and by line 31 to receiver-magnet 32, which when energized closes contacts at 42, from thence through wire 33 to contact-piece 11 and through wire 35, transmitter-section 34 to ground 36, and from the ground of the central-office instrument and through said instrument and through line 41 to receiver-magnet 37, from thence through wire 38 to contact-piece 12 and through wire 40, transmitter-section 39 to ground 36. The central-office attendant having plugged in the called subscriber, the calling subscriber moves his stylus away from contact with contact-pieces 11 and 12, in order to manipulate the same within square 18 in forming the characters to be traced by the pen of the receiver, and in this movement he cuts in his transmitter, the circuits then being from ground

36 (of apparatus 26) to transmitter-section 34, through wire 35 to contact-point 11, through wire 33 to receiver-magnet 32, through line 31 to battery-plug 29, to upper battery 28, from thence to battery-plug 29′, through line 31 to the called subscriber's apparatus 25 to receiver-magnet 32, wire 33 to contact-piece 11 to stylus 19 in contact therewith and to ground 44. The second circuit, starting from ground 36 of the calling subscriber's apparatus, passes to transmitter-section 39 by wire 40 to contact-point 12, from thence by wire 38 to receiver-magnet 37 and to binding-post 50, from thence through line 41 to outside contact of battery-plug 29, through lower battery 27 to outside contact of battery-plug 29′, from thence through line 41 to binding-post 50 of the called subscriber's apparatus 25, then to receiver-magnet 37, and by wire 38 to contact-point 12 to stylus 19 and to ground 44. When the calling subscriber has finished writing and releases his transmitting-stylus, the moment it assumes its normal position in contact with contact-points 11 and 12 his transmitter is thrown out of circuit, his instrument being again in normal condition and in readiness to receive a message. It will thus be seen that to normally maintain the receiver in circuit and to bring the transmitter into circuit when it is desired to send a message and to cut out the transmitter when the message has been sent requires no calculation or care on the part of the subscriber, the operations being wholly automatic.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a writing-telegraph, the combination, with a transmitting-stylus electrically connected to ground, of contact-points electrically connected to the line, and shifting means arranged to automatically move and press said stylus against said contact-points, substantially as described.

2. In a writing-telegraph, the combination, with a transmitting-stylus electrically connected to ground, of contact-points electrically connected to the line, and a spring arranged to automatically press said stylus against said contact-points, substantially as described.

3. In a writing-telegraph, the combination, with a transmitting-stylus electrically connected to ground, of contact-points electrically connected with the receiving and transmitting instruments, and a spring arranged to automatically press said stylus against said contact-points, substantially as described.

4. In a writing-telegraph, the combination, with a transmitting-stylus connected to the base by a spring and electrically connected to ground, of contact-points electrically connected to the line, said spring serving to press the stylus against said contact-points, substantially as described.

5. In a writing-telegraph, the combination, with a transmitting-stylus electrically connected to ground, of a contact-point connected by a line to a central-office annunciator, said stylus being arranged in proximity to said contact-point, so that it can be brought into contact with the same to close the circuit through the annunciator to drop the shutter, substantially as described.

6. In a writing-telegraph, the combination, with a transmitting-stylus electrically connected to ground, of two contact-points, each connected to both receiver and transmitter, and shifting means arranged to automatically move and press said stylus against said contact-points, substantially as described.

7. In a writing-telegraph, the combination, with a transmitting-stylus electrically connected to ground, of contact-points electrically connected to receiver and transmitter, said receiver being connected to transmitter and through transmitter to ground, and shifting means arranged to automatically move and press said stylus against said contact-points, substantially as described.

8. In a writing-telegraph, the combination, with a transmitter and a receiver, of contact-points in communication with said receiver, an independent contact-point in communication with the main line, and a grounded stylus normally resting against the contact-points communicating with the receiver, thereby normally maintaining the apparatus in condition to receive a message and arranged to be moved against said independent contact-point to momentarily close the circuit through the central-office annunciator-magnet, substantially as described.

9. The combination, with the transmitter-supporting plate, of the form or block 9, having an opening therein and provided with contact-pieces, as 11, 12, and 13, and a grounded transmitting-stylus, substantially as described.

10. The combination, with block 9, having an opening therein and provided with contact-pieces 11, 12, and 13, of protecting-cap 20 and a grounded transmitting-stylus, substantially as described.

Signed at New York, in the county of New York and State of New York, this 21st day of September, A. D. 1888.

HARRY ETHERIDGE.

Witnesses:
J. J. KENNEDY,
J. E. M. BOWEN.