(No Model.)

F. E. FISHER.

TALKING STRAP FOR TELEPHONE SWITCH BOARDS.

No. 314,819. Patented Mar. 31, 1885.

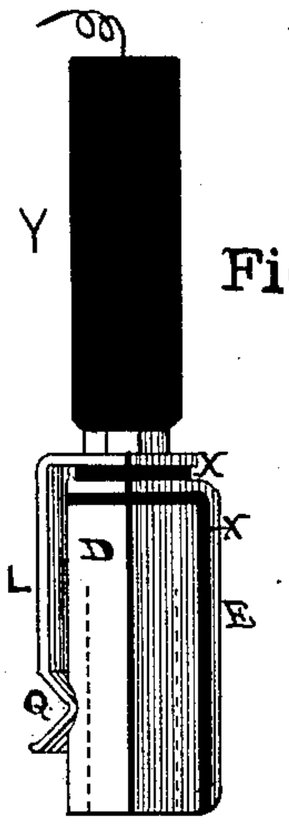


Fig. 2

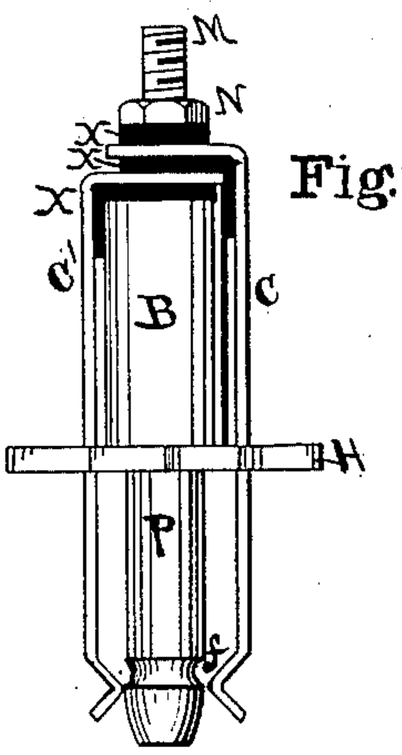
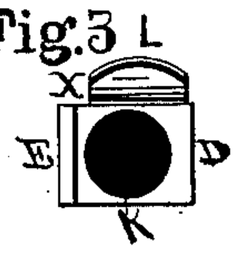


Fig. 1

Fig. 3



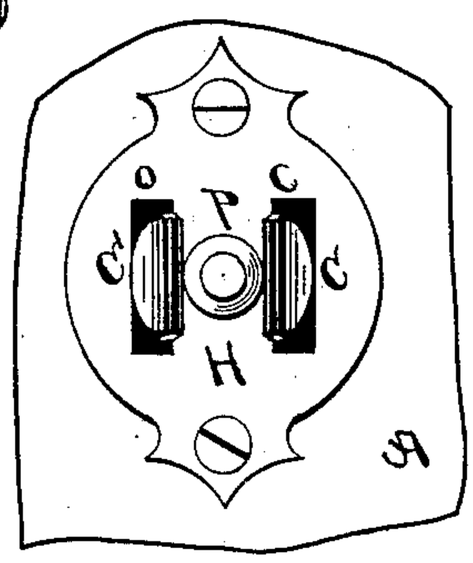


Fig. 4

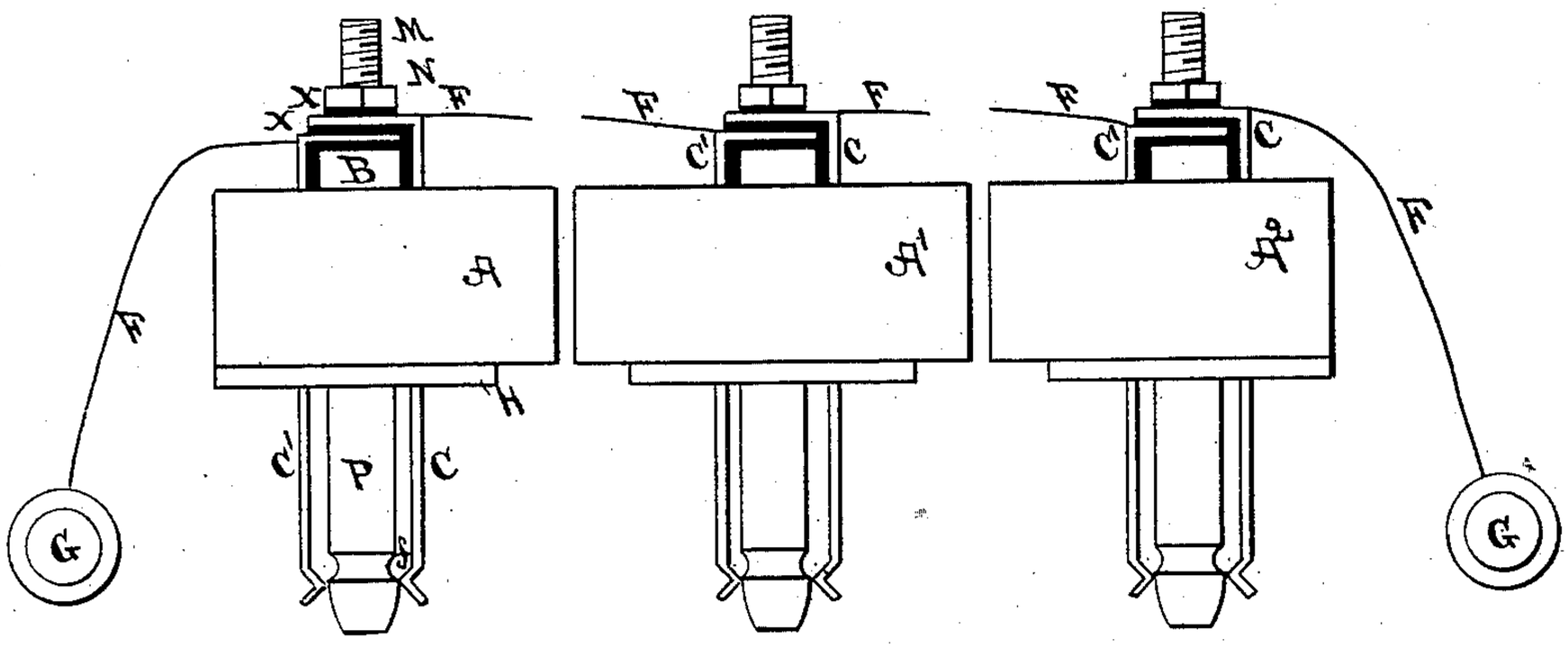


Fig. 5

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UNITED STATES PATENT OFFICE.

FRANK E. FISHER, OF DETROIT, MICHIGAN, ASSIGNOR TO THE DETROIT ELECTRICAL WORKS, OF SAME PLACE.

TALKING-STRAP FOR TELEPHONE SWITCH-BOARDS.

SPECIFICATION forming part of Letters Patent No. 314,819, dated March 31, 1885.

Application filed October 18, 1884. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. FISHER, of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Improvement in Talking-Straps for Telephone Switch-Boards, of which the following is a specification.

Figure 1 is a perspective of the strap. Fig. 2 is a perspective of the connecting-plug. Fig. 3 is an end view of the connecting-plug. Fig. 4 is a front elevation of a portion of a switch-board, showing one talking-strap; and Fig. 5 is an outline view of part of three switch-boards, showing the connection between them.

My invention is intended for use in telephone-exchanges arranged upon the group system, where it is necessary to make connection between two switch-boards in order to connect two subscribers whose lines terminate at different switch-boards; and it consists in a device whereby an operator at one switch-board in calling a switch-board at her right cuts off from the circuit of the strap all switch-boards at her left, and vice versa, and in the act of breaking connection restores the circuit through the strap, so that it is impossible to leave a subscriber's line open in the exchange.

A represents a portion of a switch-board. B represents a metal piece projecting through a hole in the switch-board, and cast on a metal shield, H, which is screwed to the switch-board. P represents a cylindrical piece of metal cast on or secured to shield H and projecting forward of the switch-board. Its end is somewhat pointed, and a groove, *f*, is cut around the base of the point. C C′ represent two metal springs, which are fastened to B by slipping the threaded shank M, which is part of B, through holes in right-angled ends of said springs and screwing the nut N on said shank. Springs C C′ are insulated from each other and from B by strips of insulating material, X. These springs C C′ pass through slots O in shield H and press against cylinder P, so that they are thus in electrical communication.

F represents a wire or conductor, which connects spring C′ on the switch-board at one end of the exchange with the ground G, then connects C on said switch-board with spring C′ on the next switch-board, and so on through all of the switch-boards in the exchange, the last being grounded, as shown in Fig. 5. This forms a complete circuit or talk-strap through all the switch-boards, and as many of these straps or circuits are put in as are necessary to accommodate the business of a given exchange.

X represents insulating material (rubber, &c.) wherever used in the drawings.

D represents a plug for making connection with the talking-strap. It consists of a metal body, D, preferably rectangular, having a hole, K, drilled therein longitudinally and large enough to just easily slide over cylinder P.

Y represents the handle of the plug, made of any suitable non-conducting material, and a flexible connecting metallic cord passes through this handle and is connected to the metal part of the plug, the other end of said cord being connected with a plug adapted to make connection with a line-switch, as described in an application for a patent heretofore made by me and now pending.

E represents a piece of metal secured at one side of D, but entirely insulated therefrom. This strip of metal E is only a facing for the insulation X, to protect it and afford a smooth sliding surface, and may be dispensed with by making the insulating material of some hard smooth material, such has hard rubber, glass, &c.

L represents a spring secured to D and having its free end bent into a V shape, as shown at Q, the point thereof lying normally in a slot cut through D into hole K. It is obvious that this construction of spring L renders it impossible to force plug D over cylinder P, except when the plug is in such a position that spring L will pass between springs C C′ without coming in contact with either, and that when the plug is forced over cylinder P the V portion of the spring L will engage with notch *f* and hold the plug in position. The act of forcing the plug over cylinder P forces springs C C′ away from P, thus breaking the contact which afforded electrical communication between the springs.

The end of plug D may be slightly beveled,

and the extreme ends of C C′ turned outwardly to facilitate the entrance of the plug between the springs.

The operation of my invention is as follows: Suppose the switch-boards A each contain fifty lines, that the talking-strap shown is No. 1, and that subscriber 51 on board A′ wishes to talk to subscriber 150 on board A². Subscriber 51 calls the exchange, and, when in communication with the operator in charge of the board A′, asks for No. 150. The operator forces plug D on cylinder in such manner that the insulated strip E comes in contact with spring C′, and thus cuts off board A and all boards on the same side, because electrical communication between spring C′ and cylinder P on board A′ is broken by means of the insulation between strip E and D, while the circuit between boards A′ A² and all boards on the same side is not affected. The operator at board A′ then calls up the operator at board A² and asks for No. 150 on strap 1. The operator connects the line of 150 with strap 1, using a plug like D, and so placing the plug as to break the circuit through the strap on the farther side from board A′. The first operator now rings up No. 150, and then connects the cord attached to plug D to the line of No. 51, when the two subscribers can talk together.

It is evident that the two grounds at the ends of the talking-strap are entirely cut out, so that they do not interfere with the telephonic circuit.

When the signal for disconnection is given, the act of pulling off either plug D restores the ground at the end of the talking-strap, so that if either or both operators forget to disconnect the subscriber's line from the strap such line is always grounded and the subscriber can operate his annunciator, thus obviating the present difficulty experienced from occasionally leaving a subscriber's line open in the exchange.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A talking-strap for switch-boards in a telephone-exchange, consisting of a metal piece fixed in each switch-board, having a pointed metal projection, and having fastened thereto two metal springs insulated therefrom and from each other at the point of fastening, but normally in contact with the projecting metal piece, electrical conductors connecting alternate springs on adjoining switch-boards with each other and the outside spring on each end switch-board with the ground, and a plug adapted to slide over said pointed metal piece and break the contact of said springs therewith, and having one of its surfaces insulated from the rest of the plug, substantially as shown and described.

2. A talking-strap for switch-boards in a telephone-exchange, permanently grounded at each end, wherein the circuit in each switch-board is composed of two insulated contact-springs normally in contact with a common electrical conductor, in combination with a connecting-plug adapted, when placed in position, to break the contact of said springs and their common conductor, and having one side thereof insulated, substantially as shown and described.

3. In a telephone-exchange, the combination of the switch-boards A A′, &c., metal pieces B, each having the projection P, with groove *f*, insulated contact-springs C C′, and conductors F, substantially as shown and described.

4. In combination with a talking-strap connecting the switch-boards in a telephone-exchange, and consisting in each board of the metal piece B, projection P, and insulated contact-springs C C′, the connecting-plug D, having the insulated side E, substantially as shown and described.

5. In a talking-strap for telephone switch-boards, the combination of the metal piece B, projection P, having thereon the groove *f*, insulated contact-springs C C′, and plug D, having spring L, with V-shaped part Q, adapted to engage with groove *f*, and insulated side E, substantially as and for the purposes set forth.

6. A talking-strap for switch-boards in a telephone-exchange, permanently grounded at each end, and consisting at each switch-board of two contact-springs insulated from each other, but in contact with a metal piece adapted to receive and hold a connecting-plug when said plug is not in use, substantially as shown and described.

7. A talking-strap for switch-boards in a telephone-exchange, permanently grounded at both ends, in combination with a connecting-plug having one side insulated, whereby the ground at one end of the strap is cut out whenever the connecting-plug is placed in position, substantially as and for the purposes set forth.

FRANK E. FISHER.

Witnesses:
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