(No Model.)

# F. W. HARRINGTON.

## SWITCH BOARD.

No. 310,890. Patented Jan. 20, 1885.

*Fig. 1,*

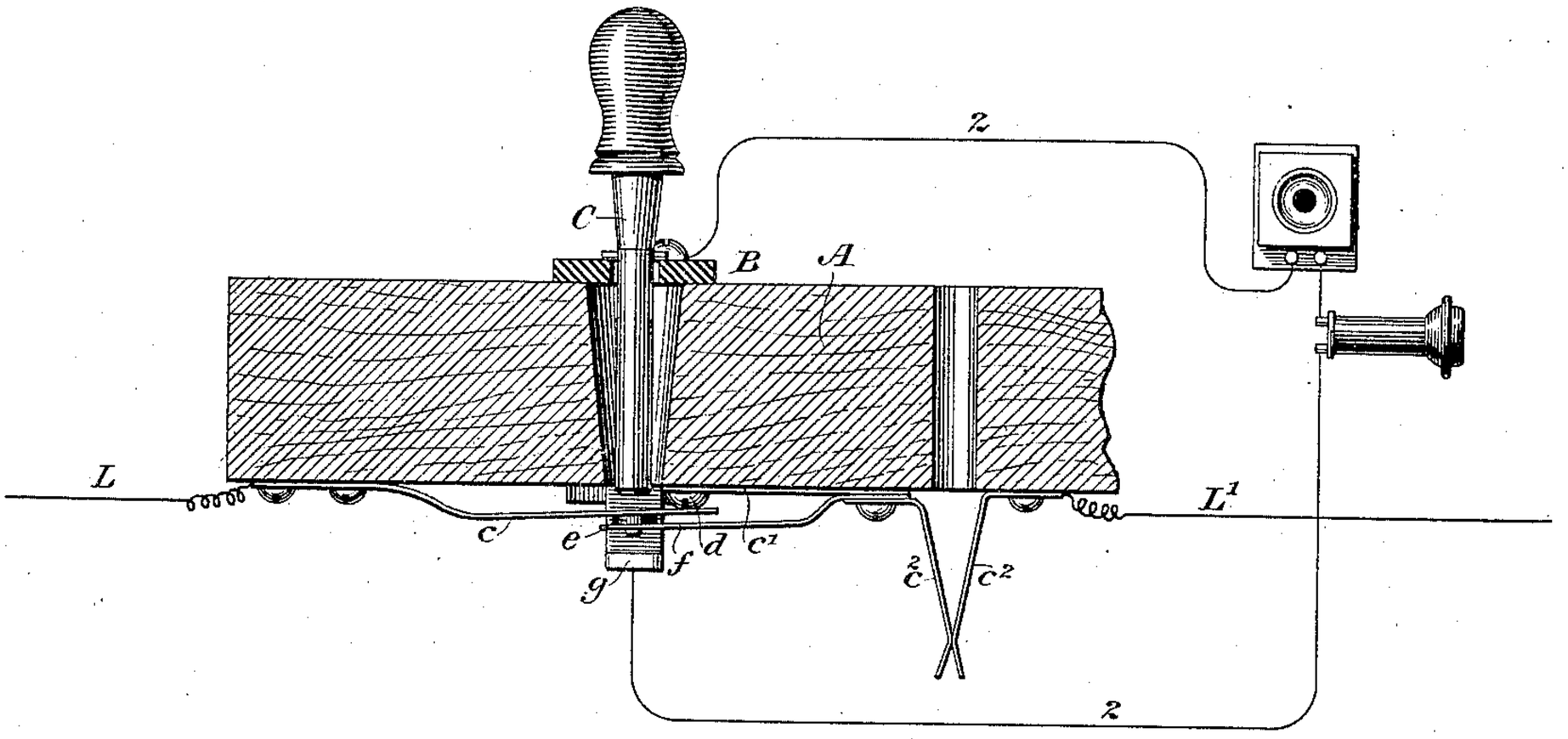
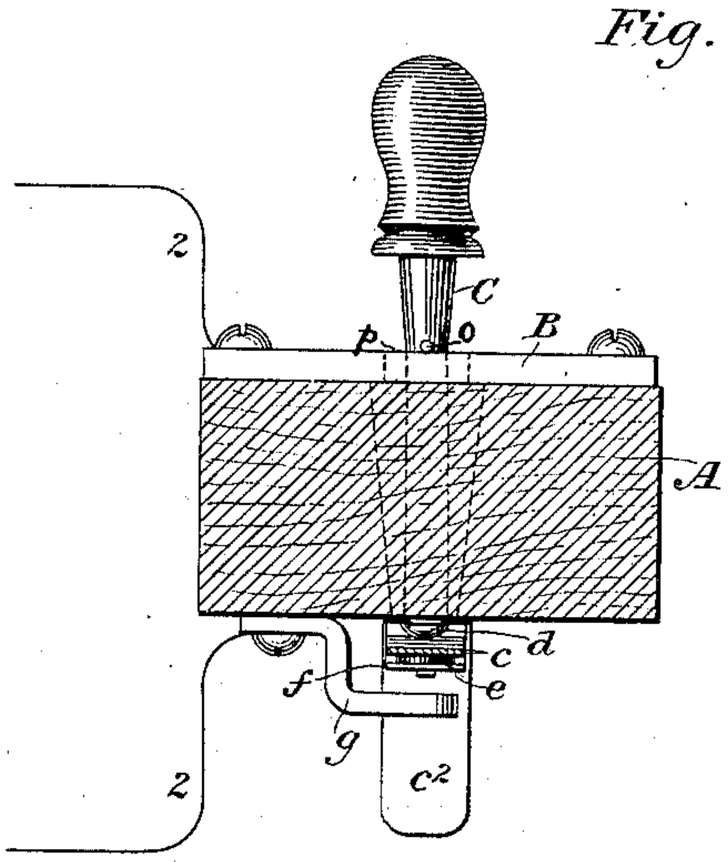



*Fig. 2,*




Witnesses

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# UNITED STATES PATENT OFFICE.

FRANK W. HARRINGTON, OF CHARLESTOWN, MASSACHUSETTS.

## SWITCH-BOARD.

SPECIFICATION forming part of Letters Patent No. 310,890, dated January 20, 1885.

Application filed April 19, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK W. HARRINGTON, a citizen of the United States, residing in Charlestown, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Switch-Boards, of which the following is a specification.

My invention relates to certain improvements in the construction of devices employed in connection with telephonic switch-boards, for the purpose of conveniently securing electrical connections with various lines connected therewith.

The object of the invention is to provide means whereby the necessary operations of introducing telephonic instruments into the circuit of the main line at the central station and cutting them out at will may be readily and effectively accomplished.

The invention relates especially to a class of devices described in Letters Patent No. 250,081; and it consists, generally, in constructing the apparatus in substantially the following manner: Each telephonic conductor is provided with the usual system of circuit-completing strips and springs, and, in addition thereto, with two other metallic springs. Through one of these additional springs the normal connections of the line are made. An independent contact-plate is connected with one terminal of the conductor including the central-office telephonic instruments, and through this plate extends a switch-plug, which is designed, when it is desired to place the central-office instruments in circuit, to impinge against the additional contact-spring, through which the normal line-connections are made, and to press it out of contact with the resting contact-stop, thereby severing the normal line-connections. A second contact-spring, however, which is connected with the resting-stop, is by the same operation placed in electrical connection with the other terminal of the conductor including the instruments. When, therefore, the plug is pressed inward, the main-line connections are completed through the switch-plug to the switch-plate, and thence through the instruments to the resting contact, and thus with the remaining portion of the main line.

In the accompanying drawings, which illustrate my invention, Figure 1 is a side elevation, partly in section, of a portion of a switch-board, and Fig. 2 is a cross-section of the same.

Referring to the drawings, A represents the non-conducting base of the switch-board, upon which is mounted a brass or other metallic plate, B. Through and in metallic connection with this plate extends a switch-plug, C. The plug C is normally held outward, as shown in the drawings.

Applied to each plug C is a spring, *c*, which normally rests in contact with a contact-stop, *d*. The spring *c* is in electrical connection with one portion of the main line—say, for instance, the conductor leading to the switch-board, as shown at L. The point *d* is in electrical connection, through connecting-strip *c'* and a series of circuit-springs, $c^2$ $c^2$, such as described in the patent referred to, with the outgoing line L'. When, therefore, the plug C is in its normal position, the main-line connections are complete through the spring *c* and point *d*.

Applied to the spring *c* upon the opposite side from the plug C is a non-conducting plate or block, *e*, which is designed to be pressed into contact with a second flexible spring, *f*, when the plug C is pressed in. The spring *f* is thereby pressed into contact with a point, *g*, carried upon the non-conducting base A. The point *g* is in electrical connection with one terminal of a conductor, 2, in which the telephone T is included. The other terminal of this conductor is connected with the plate B. Such other instruments as may be desired are included in the conductor 2.

It will be understood from the foregoing description that when it is desired to place the telephone-receiver and the transmitting-instruments in circuit with any given line it is necessary only to push the corresponding plug C inward, thereby interrupting the connections of the main line at the point *d*, at the same time completing the connections from the spring *c* to the plug C, and thus to the conductor 2. The remaining terminal of the telephone-conductor 2 will at the same time be connected through the point *g* and spring *f*, which has been pressed in contact therewith, to the series of springs $c^2$, and thus with the main line L', or with any other conductor which may be substituted therefor, through

the agency of the springs $c^2$, in the usual manner. The telephone transmitting and receiving instruments being then in circuit, they may be employed in the usual manner.

For the purpose of readily retaining the plug C in its forward position, a pin, *o*, extends through the same and projects slightly upon each side. The ends of the pin are designed to pass through corresponding notches, *p*, formed in the plate B when the plug is pressed inward. By turning the plug slightly after it has been pressed in, the ends of the pin will be brought beneath the plate B, and the plug will then be held in position notwithstanding the pressure exerted by the spring *c*.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, with a telephonic main line, of a contact-spring and its contact-point included in the circuit of said line, a local telephonic conductor and telephonic apparatus included therein, a switch-pin in electrical connection with one terminal of said local conductor, a contact plate or point in electrical connection with the other terminal of said local conductor, a flexible spring applied to the last-named point, which spring is in electrical connection with one portion of said main line, and is adapted to be placed in contact with said point through the action of said switch-plug after said plug has interrupted the normal connections of said main line, substantially as described.

2. The combination, substantially as hereinbefore set forth, of the plug C, the spring *c*, the point *d*, the spring *f*, the point *g*, and the circuit-connections of the same, substantially as described.

3. The combination, substantially as hereinbefore set forth, with a telephone main line and the central-office instruments, of a contact-spring connected with said main line, a resting contact-point, through which the normal connections of said main line are completed from said spring, a contact-point in electrical connection with one terminal of the conductor including said instruments, a switch-plug connected with the other terminal of said conductor, which plug, when caused to impinge against said spring, completes an electrical connection therewith and separates the same from said resting contact-stop, and also places said resting-stop in electrical connection with the remaining contact-point.

4. The combination, substantially as hereinbefore set forth, in a switch-board, of a flexible circuit-closing spring, a flexible contact-spring applied thereto, two contact-points which are respectively applied to said circuit-closing and contact springs, means for preventing said springs from making electrical connection with each other, and a switch-plug which, by impinging against said circuit-closing spring, serves to separate the same from its contact-point and to force said contact-spring against its contact-point.

In testimony whereof I have hereunto subscribed my name this 11th day of April, A. D. 1884.

FRANK W. HARRINGTON.

Witnesses:
DANL. W. EDGECOMB,
CHARLES A. TERRY.