

(No Model.)

E. T. GILLILAND.

LOOPING IN SWITCH.

No. 336,563.

Patented Feb. 23, 1886.

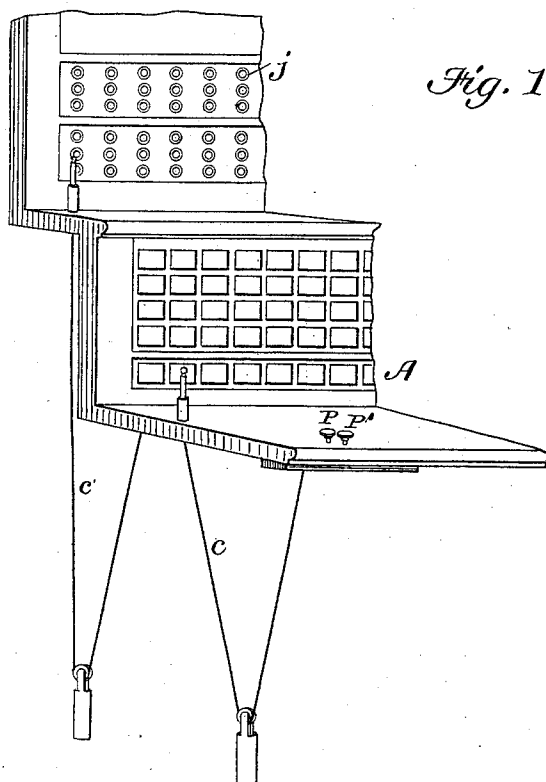


Fig. 1.

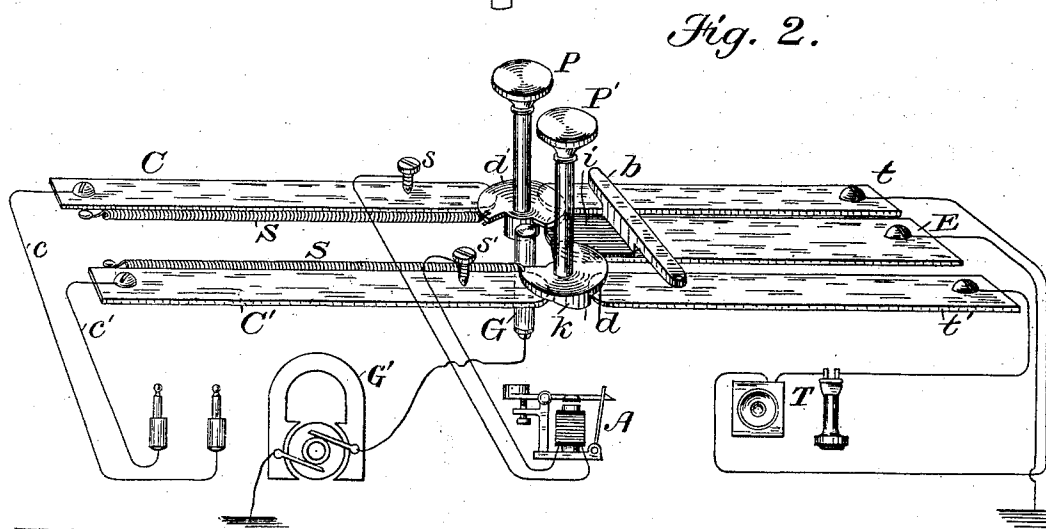


Fig. 2.

Witnesses.
Geo. Willis Pierce,
Wm B. Vansize

Inventor.
Ezra T. Gilliland

UNITED STATES PATENT OFFICE.

EZRA T. GILLILAND, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
AMERICAN BELL TELEPHONE COMPANY, OF SAME PLACE

LOOPING-IN SWITCH.

SPECIFICATION forming part of Letters Patent No. 336,563, dated February 23, 1886.

Application filed October 31, 1885. Serial No. 181,525. (No model.)

To all whom it may concern:

Be it known that I, EZRA T. GILLILAND, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain
5 Improvements in Looping-in Switches, of which the following is a specification.

This invention, called a "looping in switch," is an improved combination of apparatus to be located in the central office of a telephone-exchange. Its arrangement is such that by the
10 depression of one of two buttons a listening-telephone may be introduced into a telephone-circuit; by the depression of the second button the said telephone is introduced into a second
15 circuit; by the depression of both buttons simultaneously the telephone is looped into the circuit of two connected lines, and by imparting a rotary movement to a button a call is transmitted on one line or the other, depending upon which of the buttons is operated
20 and upon the connection of the flexible conducting cords in the circuit of which the apparatus is normally included.

Figure 1 shows a section of a multiple
25 switch-board to which my improvement is applied. Fig. 2 is a detail plan view of the looping-in mechanism.

C C' are two strips of spring-brass, to which flexible conducting-cords *c c'* are respectively
30 connected. These strips rest by their resilience upon two stops, *s s'*, respectively connected to opposite terminals of the clearing-out annunciator A.

t t' are strips of spring-brass, to which the
35 opposite terminals of the operator's telephone-set T are respectively connected.

E is a similar strip of spring-brass connected to ground. Its free end is covered with a plate of insulating material, *i*, in connection
40 with E, and fixed near its free end is a metal bar, *b*, overlapping springs *t t'*, but normally out of contact therewith.

G is a fixed metal post to which a grounded generator of electricity is connected.

45 G' indicates a type of generator that may be used, though obviously any generator suitable for signaling purposes may be employed.

P P' indicate the controlling-keys, consisting of buttons of insulating material fixed to
50 the ends of spindles, which are placed in bear-

ings so that they can either be moved longitudinally or rotated. Upon the opposite ends of these spindles are fixed disks *d d'*, of metal, having a sector removed therefrom. The post G is located within the circumferential line of
55 both disks. Upon the under side of disks *d d'* are cam-shaped projections *k*. One disk overlaps springs C, *t*, and E, and the other overlaps C', *t'*, and E. When button P' is depressed it carries with it strips *t'* and E. The bar *b* on E, 60 making electrical contact with strip *t*, grounds said strip. When P is depressed, the same is true as regards *t*, E, and *t'*, respectively. When both P and P' are simultaneously depressed, the relative position of *t*, E, and *t'* is
65 unchanged, and neither *t* nor *t'* are grounded. The spindles are held in their normal position against longitudinal motion by the resilience of the flat spring-pieces which they overlap, and from rotary movement by helical
70 spring S.

The apparatus is placed in position upon the table of a switch-board, as shown at P P', Fig. 1. When a call is indicated, one of the
75 cord-tips, as *c'*, is inserted in a jack, as *j*, and the button P' depressed. The depression of P' carries with it springs C', *t'*, and E, breaks contact between C' and *s'*, makes contact between C', *d*, and *t'*, and between E and *t*. Circuit then is *via* elements *c' C' d t' T t E* to
80 ground. The telephone is thus placed in the calling-subscriber's circuit. Cord *c* is now placed in the called-for circuit and a rotary movement given to button P. The cam *k* on disk *d'* travels upon the surface of C, depress-
85 ing it, breaking contact between C and *s*, and making contact between G and C, P being rotated until that edge of the disk left by the removal of the sector strikes generator-post G. Button P immediately resumes its normal
90 position, and the telephone T may be inserted by depressing P in the same manner and to the same effect as described in respect to P'. Connection is now complete, the circuit being
95 *via C s A s' C' c'.*

To loop the telephone set T into the compound circuit, both buttons P P' are simultaneously depressed. This breaks the connection with *s s'* and makes connection between C and *t* and C' and *t'*, respectively. In this
100

manner I make two press-buttons perform the functions now performed by two press-buttons and two switch-levers.

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

1. A looping-in device for a telephone-exchange, consisting of the combination of two movable contacts in the circuit of a pair of conducting-cords, two movable contacts connected to opposite terminals of a telephone, a movable ground-contact, and two controlling-keys, by the operation of which two or more of said movable contacts may be connected together and to the ground, either or both.

2. A looping-in device consisting of two movable contacts included in the circuit of a pair of conducting-cords, two movable electrical contacts, to which the terminals of a telephone are respectively connected, a movable ground-contact, a fixed generator-contact, and two controlling-keys, whereby two or more of said movable contacts may be connected together, or either of the first-named contacts connected with the generator.

3. The combination, in a telephone-exchange, of two flat spring-contacts in the circuit of a pair of conducting-cords, two similar flat spring-contacts respectively connected to the opposite terminals of a telephone, a flat spring connected to ground, and a pair of controlling-keys, as P P', for inserting the telephone with respect to either or both of two connected circuits.

4. The combination of a pair of spring-contacts in circuit with connecting cords and plugs, a pair of rotatable buttons or keys having each a disk partly cut away, and a cam on

said disk, and a grounded generator-post within the circumferential line of both said disks, whereby the normal circuit of either of said springs may be broken and connection made with the generator, substantially as described.

5. A looping-in switch comprising, in combination, a pair of contacts in circuit with conducting cords and plugs, a pair of movable contacts forming terminals of a telephone-circuit, a movable ground-contact, a grounded generator-contact, and a pair of controlling-keys comprising each a spindle having rotary and longitudinal movements, and a conducting disk or plate, all of said contacts being under the control of one, and said ground and generator contacts being under the control of both, said controlling-keys, substantially as described.

6. In a looping-in switch, the combination of a separable electrical contact in the circuit of a conducting cord and plug, an electrical contact connected with a generator, an electrical contact connected with a telephone, and a controlling-key capable of rotation and depression, one movement establishing connection between the cord and generator-contact, and the other establishing connection between the cord and telephone-contact, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 5th day of October, 1885.

EZRA T. GILLILAND.

Witnesses:

WM. B. VANSIZE,
GEO. WILLIS PIERCE.