(No Model.)

C. E. SCRIBNER.

KEY BOARD APPARATUS FOR TELEPHONE EXCHANGES.

No. 383,018. Patented May 15, 1888.

Fig. 1.

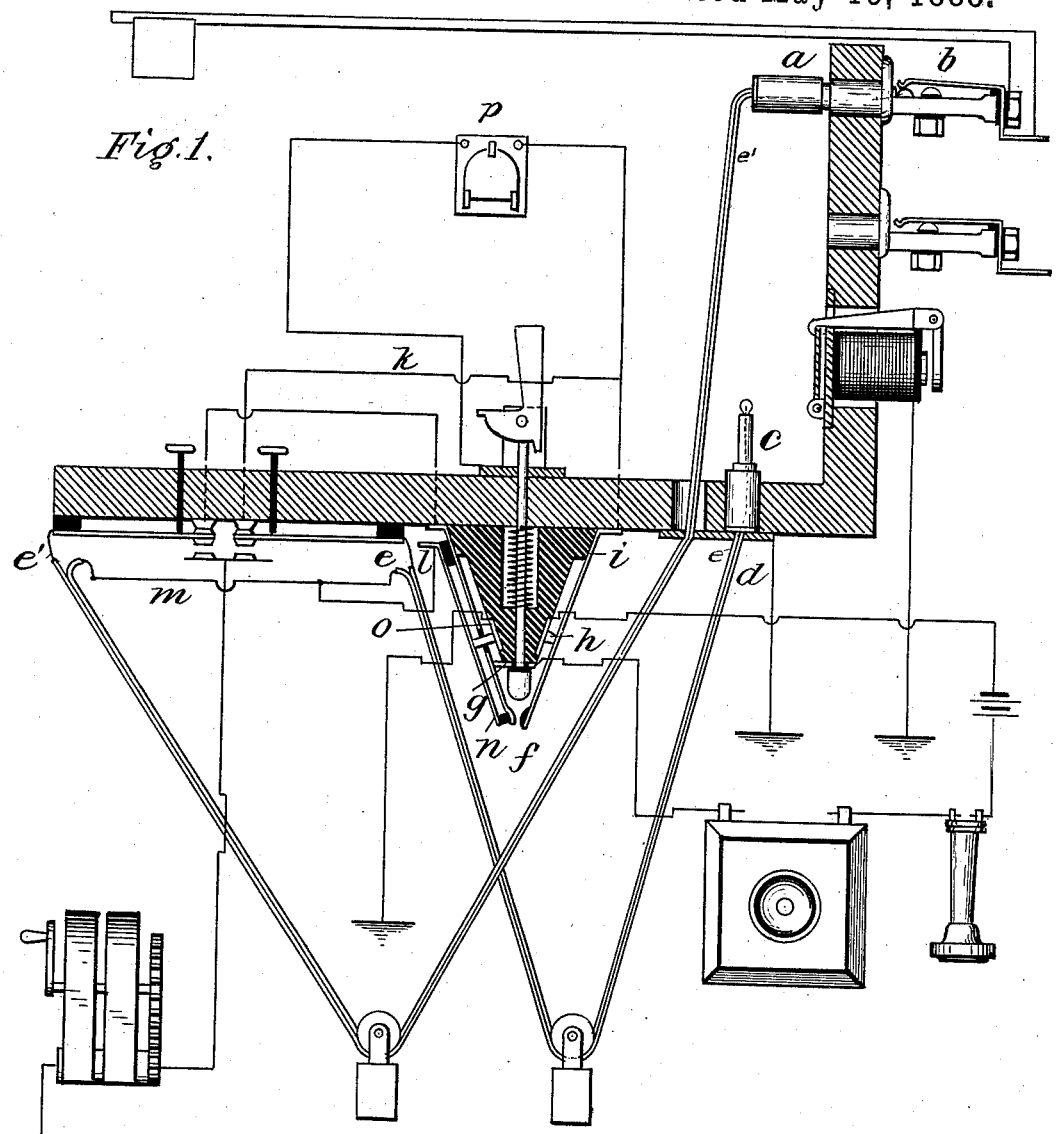
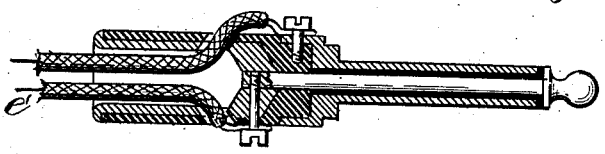


Fig. 2.



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UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

KEY-BOARD APPARATUS FOR TELEPHONE-EXCHANGES.

SPECIFICATION forming part of Letters Patent No. 383,018, dated May 15, 1888.

Application filed December 27, 1886. Renewed November 21, 1887. Serial No. 255,770. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Key-Board Apparatus for Telephone-Exchanges, (Case 119,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention is designed for use in connection with metallic-circuit systems of telephone-exchange, and may be used in connection with either single or multiple switch-boards. Such metallic circuits usually may terminate each in a different spring-jack. In some cases metallic circuits and ground circuits are used in the same exchange.

By the use of my invention not only metallic circuits, but ground circuits, may be connected together, or a ground circuit with a metallic circuit, all by means of the same apparatus.

When the loop-plug of a pair is inserted in a spring-jack for answering the initial call, it is desirable to ground both strands of the cord, so that the operator's telephone will be connected in metallic circuit extending to the subscriber's station. When the other plug of the pair is inserted in the switch of the subscriber wanted, both of these grounds should be removed in order that the two subscribers' lines may be looped together in metallic circuit with no ground branch at the central office.

Heretofore the tips of the pair of loop-plugs have been connected with one of the strands of a double cord and the insulated sleeves of the said plugs with the other strand. A metallic heel-piece has been provided on each of the plugs, which connects with the tips. When the heel of either plug rests upon a ground-plate, it is evident that one strand of the cord is closed to ground.

My invention consists in providing a switch device, in connection with the listening-key or loop-switch, by means of which the strand of the cord connecting with the sleeves will be closed to ground when the operator's telephone is looped into the circuit of the cords.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a diagram illustrative of my key-board system. Fig. 2 is a detailed sectional view of an ordinary loop-plug provided with an ordinary metallic heel connecting with the point.

Like parts are indicated by similar letters of reference throughout the different figures.

Loop-plug *a* is shown inserted in spring-jack *b*. The heel of the other plug, *c*, is shown resting upon ground-plate *d*. The line-terminal of switch *b* rests upon the point of plug *a*. The point of plug *a* is connected with strand *e'* of the cord, and thence the circuit may be traced through a calling-key to spring *f* of the loop-switch, which spring *f* rests upon contact-piece *g*.

It will be seen that contact-piece *g* is permanently insulated from the plunger. From contact-piece *g* the circuit may be traced through the telephone and test-battery to point *h*, against which spring *i* of the loop-switch rests. From thence the circuit may be traced by wire *k* to the other calling-key, with which strand *e* is connected. This strand *e* connects with the tip of the plug *c*, and hence with the heel which rests upon the ground-plate *d*. We have thus the circuit of the line-terminal of switch *b* through the strand *e e'* of the cord to ground. The other line-terminal of switch *b* is the insulated frame, which, when the plug is inserted, is connected with the metallic sleeve upon the shank of the plug, and thence the circuit may be traced through strand *m* to spring *n*, and thence, when the loop-switch is in the position shown, to contact-point *o*, which is connected with the ground. Thus when a loop-plug is inserted both strands of the cord are connected to ground when the telephone is looped into the circuit.

In multiple-switch-board systems, when it is desired to test a line wanted, the plug *c* may be lifted and applied to the test plate or frame of the spring-jack of the line to be tested. When thus touched to the frame, circuit will be closed from said frame through the tip of plug *c*, through the strands *e e'*, as before described, to the tip of plug *a*, and thence over the line connected with switch *b* back to the

frame of said switch *b*, and thence by strand *m* to spring *n* and contact *o* to ground. The plugs of each pair may be used interchangeably, and no matter which is used, when the cam-lever of the listening-key is in the position shown, the telephone outfit will be included in one strand of the cord, while the other strand will be connected to ground. On throwing down the cam-lever the telephone will be disconnected from the circuit and the ground-point *o* will be opened at spring *n*, while the clearing-out annunciator *p* will be included in the circuit.

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

1. In a key-board system, the combination of double-pointed plugs connected together by double-stranded cords, the tips of the plugs being connected by one strand and the insulated sleeves by the other strand of the cord, ground-contact upon the heels of each plug, said ground-contact being permanently connected with the tip, a listening-key included in the circuit of the strand, connecting the tips of the plugs, and a ground-switch operated by said listening-key, connected with the strand included between the sleeves of said plug, whereby the operator's telephone outfit may be included in one of the strands of the cord and the other strand simultaneously grounded, substantially as shown and described.

2. A metallic circuit extending from the spring of a spring-jack switch at a telephone-exchange station out through a subscriber's station and back to the insulated frame of said switch, in combination with a loop-plug inserted in said switch, a double-stranded cord connecting with said loop-switch, the strand connecting with the tip of the plug being normally grounded and the other strand being normally open, a telephone, and a switching device, whereby the telephone may be looped into the strand connecting with the tip, while the other strand which connects with the sleeve is grounded to complete a metallic circuit through the said telephone and the subscriber's station.

3. The combination, with a metallic circuit extending from ground at the central office through a subscriber's station and back to a normally-open terminal at the central station, of a telephone and a switching device, said switching device having contacts connecting with the said telephone, and a ground-contact, whereby the telephone may be looped into the grounded side of said metallic circuit, and the normally-open side of said circuit simultaneously closed to ground to complete the circuit from the normal ground at the subscriber's station through the metallic circuit and back to the ground last formed at the central station.

In witness whereof I hereunto subscribe my name this 16th day of November, A. D. 1886.

CHARLES E. SCRIBNER.

Witnesses:

GEORGE P. BARTON,

WM. M. GILLER.