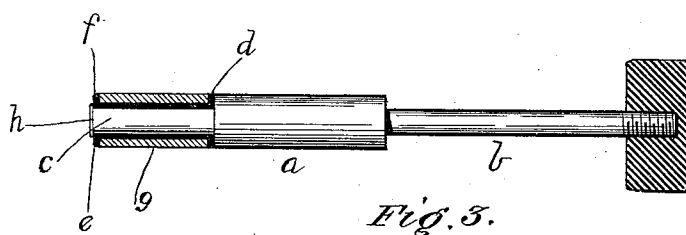
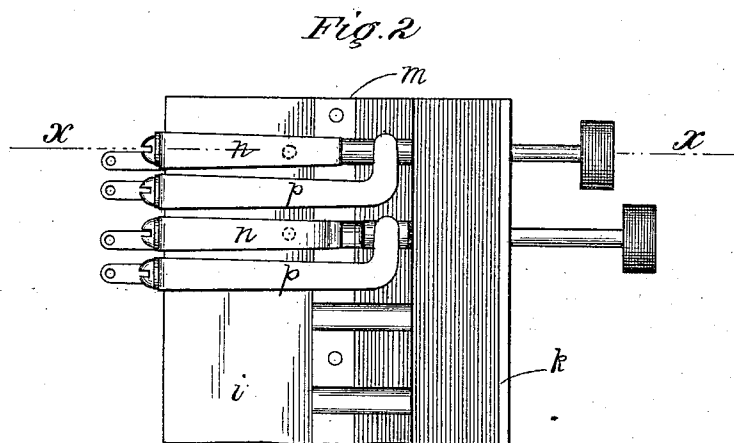
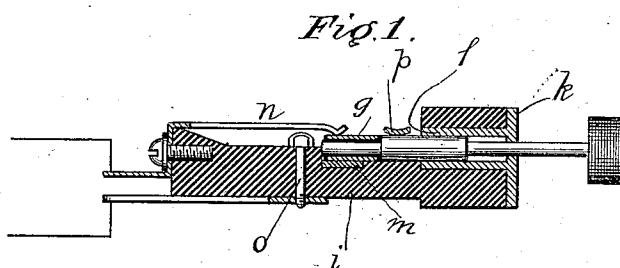


(No Model.)

C. E. SCRIBNER.
ELECTRIC LOOP SWITCH.

No. 427,123.

Patented May 6, 1890.



Witnesses:
Sam^l B. Dover.
Chas^l G. Hawley.

Inventor.
Charles E. Scribner
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UNITED STATES PATENT OFFICE.

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

ELECTRIC LOOP-SWITCH.

SPECIFICATION forming part of Letters Patent No. 427,123, dated May 6, 1890.

Application filed December 6, 1887. Serial No. 257,081. (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 Electric Loop-Switches, (Case 140,) 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 relates to electric switches, and is more especially designed for looping in and out the operator's telephone and clearing-out annunciator, respectively, in a telephone-exchange system. Heretofore various forms of switches have been employed in doing this work. When two telephone-lines are connected together for conversation, a clearing-out annunciator is usually provided in their circuits. The operator may at any time connect his telephone with the circuit to listen out or for any other purpose. When the operator's telephone is in circuit, it is desirable, that the clearing-out annunciator be out of circuit, and vice versa.

My invention relates to the construction of the loop-switches, and its object is to bring the loop-keys within the smallest space possible, and at the same time render them stronger, more durable and reliable than loop-keys heretofore constructed.

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

Figure 1 is a sectional view upon line *x x* of Fig. 2 of a loop-key embodying my invention. Fig. 2 is a plan or top view showing several loop-keys mounted upon the same strip or frame of insulating material. Fig. 3 is an enlarged detail view of the circuit-changing pin, which is pulled out and thrust in, as may be desired, to make the connections.

I will first describe the construction of this circuit-changing pin in detail.

I take a rod or tube, preferably of brass or steel, of the required diameter and turn it down, except at the portion *a*. The stem *b* and tip *c*, as well as the larger portion *a*, are thus formed of a single piece of metal. Over the tip *c* I place a rubber washer *d*, which is fitted thereto and of the same diameter in cross-section as the portion *a* of the circuit-

changing pin. The rubber bushing *e* is turned down and provided with a shoulder *f*. The metallic sleeve or thimble *g* is then slipped over the bushing against the shoulder. The bore of the bushing conforms to the size of the tip *c*. After the bushing is thus provided with the metallic thimble it is slipped over the tip *c* against the washer, so as to abut against the washer theretofore placed thereon, as shown. I then head down or upset the end *h* of the tip, so as to prevent the bushing from slipping off. A circuit-changing pin, preferably constructed in this manner, forms a part of each of my loop-keys.

Referring to Figs. 1 and 2, it will be observed that *i* is a strip or frame of hard rubber. My keys are built up upon such strips, as many keys being placed upon the same strip as may be desired. This strip *i* is provided with as many holes as there are switches to be mounted upon the same. The facing *k* may be of metal provided with metallic sockets *l*. These sockets and facing may be cast together and fitted to the rubber strip or frame so that each opening shall be provided with a metallic socket, all the sockets being electrically connected with the face or front strip. After the facing is fitted to the insulating-frame the circuit-changing pins are inserted therein from the rear, after which the knobs are screwed onto the stems of the circuit-changing pins, as shown.

m is a metallic strip placed, as shown, so that when the circuit-changing pin is forced in, the metallic sleeve of the circuit-changing pin will be in contact therewith.

The operator's telephone outfit or other instrument may be considered as included in a wire between strip *m* and the facing or strip connecting the sockets. The spring *n* may be considered as connected with one of a pair of cords. The lower contact *o* of said spring *n* may be considered as leading through the clearing-out annunciator to the other cord of the pair. Contact-spring *p* may be considered as branched directly to this same cord with which *o* is connected. When the circuit-changing pin is inserted, spring *n* is lifted from its contact-point *o*, and contact *o* is thus left open. Spring *n*, however, closing upon the metallic sleeve *g* of the circuit-changing

pin, and through the medium of this sleeve to strip *m*, which is connected with the listening operator's telephone or other instrument, that cord of the pair which connects to spring *n* has its circuit completed to one side of the operator's telephone. Spring *p*, which, as before described, may be considered as connected with the other cord, is brought into contact with portion *a* of the circuit-changing pin when spring *n* is connected with the sleeve *g*. This portion *a* is in contact with the socket, and hence with the facing *k*, and facing *k* being connected to the other terminal of the operator's telephone, a complete loop may be traced from one cord to the spring *n*, thence to strip *m*, thence to the operator's telephone outfit and to strip *k*, thence to the pin and spring *p*, and to the other cord. Thus, considering springs *n* and *p* as two terminals and the metallic strip *m* and facing *k* as two other terminals, it will be seen that any instrument—as, for example, a telephone—included between terminals *m* and *k* would be in circuit with springs *n* *p*. Suppose, now, the circuit-changing pin be withdrawn. Spring *n* closes on contact *o*, spring *p* rests upon sleeve *g*, and sleeve *g* being insulated spring *p* will be open. Thus strip *m* will be disconnected from spring *n* and spring *n* will close upon point *o*. Thus any instrument—as, for example, the clearing-out annunciator—connected with point *o* would be included in circuit with spring *n*. I am thus enabled by means of my switch to alternately loop into circuit either one of the two instruments, while the other is excluded from the circuit.

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

1. A loop-key consisting in the combination, with an insulated contact-spring which normally rests on its contact-point, of a circuit-changing pin adapted to move longitudinally in a socket, an insulated metallic piece upon the circuit-changing pin, and a contact piece or plate against which the said insulated metallic piece comes in contact at the same time it lifts the spring, whereby on inserting the pin the said insulated piece is forced against the spring to lift it from its said normal contact, thereby closing the circuit of said spring, through the medium of said insulated piece, to said contact-plate, substantially as described.

2. The longitudinally-moving circuit-changing pin provided with the insulated sleeve thereon, in combination with two contact-springs, one of said springs being in the path of the insulated sleeve and adapted to be closed thereto when the pin is inserted, the other spring bearing also against the pin and being in position to rest upon the insulated sleeve when the pin is not thrust in, but to be separated therefrom by the movement of the pin on being inserted and closed to the stem or main portion of the pin, substantially as described.

3. The contact-springs *n* and *p* and the contact *o* of spring *n*, in combination with a longitudinally-moving circuit-changing pin provided with an insulated sleeve or piece *g*, the socket or guide of said pin being metallic, and a contact plate or piece *m*, whereby the connection from spring *n* is alternated between contact *o* and contact *m*, the connection of spring *p* being alternated at the same time between insulated piece *g* and the socket by the movement of the pin.

In witness whereof I hereunto subscribe my name this 17th day of October, A.D. 1887.

CHARLES E. SCRIBNER.

Witnesses:

WM. M. CARPENTER,
CHAS. C. WOODWORTH.