

(No Model.)

2 Sheets—Sheet 1.

W. M. GOODRIDGE.
ELECTRIC SWITCH.

No. 476,792.

Patented June 14, 1892.

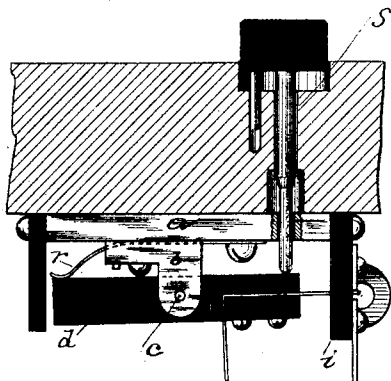


Fig. 1.

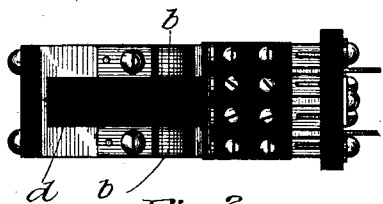


Fig. 2.

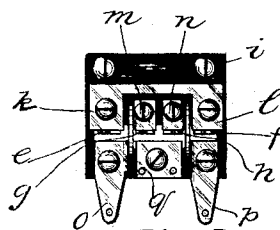


Fig. 3.

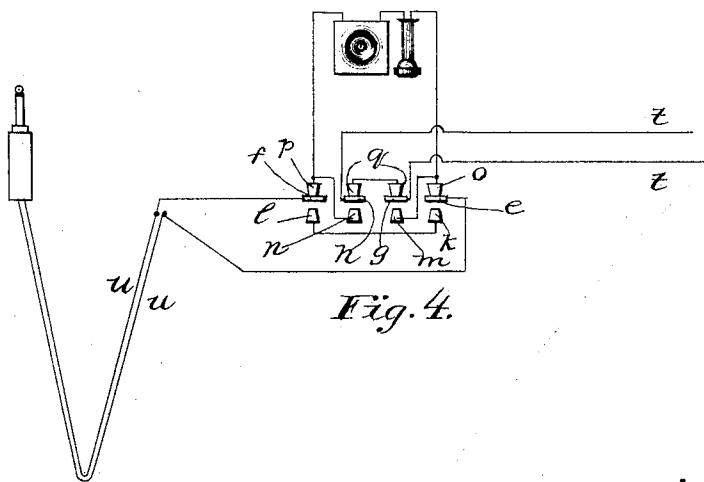


Fig. 4.

Witnesses:

Chas. G. Hawley.

Ella Adler

Inventor:

William M. Goodridge.

By *George P. Barton*
Attorney.

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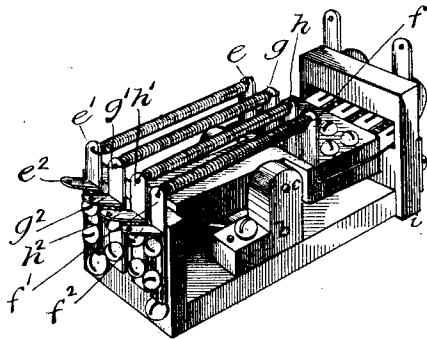


Fig. 5.

Witnesses:

Chas. G. Hawley.
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Inventor:

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UNITED STATES PATENT OFFICE.

WILLIAM M. GOODRIDGE, OF HIGHLAND PARK, ASSIGNOR TO THE WESTERN
ELECTRIC COMPANY, OF CHICAGO, ILLINOIS.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 476,792, dated June 14, 1892.

Application filed October 19, 1888. Serial No. 288,573. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. GOODRIDGE, a citizen of the United States, residing at Highland Park, in the county of Lake and State of Illinois, have invented a certain new and useful Improvement in Electric Switches, (Case No. 12,) 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 more especially designed for use at telephone-exchange stations as a part of the operator's outfit. It is sometimes desirable to loop the operator's telephone into one circuit and then into another without leaving the first circuit open. The apparatus for doing this work should be brought within as small a compass as possible and should be at the same time strong and durable and certain in its action. Such a device forms the subject of my invention.

In the drawings, Figure 1 is a side elevation of an electric-circuit changer embodying my invention. Fig. 2 is a view from below of the same. Fig. 3 is a front elevation thereof. Fig. 4 is a diagram showing an application of my circuit-changer. Fig. 5 is a perspective view from below, showing the preferable manner of connecting the movable contacts with the fixed terminals of the circuit.

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

The frame *a* may be of metal and is provided with bearings *b b* for the pivot *c* of the pivoted block *d*. Upon this block are mounted the circuit-changing contact-springs *e f* and *g h*. Upon the end of frame *a* is mounted the block of rubber *i*, which is provided with a slot, in which slot the free ends of springs *e f* and *g h* rest. Metallic contacts *k l* and *m n* are provided upon one side or edge of the slot and contact-pieces *o, p*, and *q* on the opposite side of the slot. A spring *r* normally holds the block *c* in the position shown in Figs. 1 and 3, so that the contact-springs will be forced against the contacts upon the upper edge of the slot. By means of push-button *s* the tension of spring *r* may be overcome, so as to separate the contact-springs upon the upper side of the slot and close said

contact-springs against the lower contact-pieces *o, p*, and *q*. In the diagram (see Fig. 4) the springs *e f g h* are shown separated from contacts *k l* and *m n* and closed upon contacts *o, p*, and *q*. It will be observed that contact *m* is permanently connected electrically with the contact *o* and that contact *n* is connected permanently with contact *p*.

My circuit-changer is operated by simply pressing upon the push-button *s*, so as to carry the free ends of the contact-springs from one set of contacts to another set. It is evident that various circuit connections may be made with the contact-springs and the fixed contacts. My switch, however, is of special advantage when it is desired to alternately loop an instrument, as a telephone, into one circuit and then into another without leaving the loop open, as is often desirable or necessary in telephone-exchange systems. Thus a trunk-wire *t* may be connected with the springs *g h*, a pair of cords *u* with the springs *e f*, and the operator's telephone between united contacts *m o* and *n p*. The telephone may thus be looped into the circuit of the cords, as shown in Fig. 4, while circuit *t* is closed through contact *q*. On changing the positions of the switch the telephone is looped into circuit *t*, while the strands of cords *u* are united through the contacts *k l*, permanently connected together.

The metallic piece *k l* is preferably of the form shown in Fig. 3, in order that contact-springs *e f* may be normally closed against the same, so as to complete the electrical connection between them through the medium of the contacts or contact-piece *k l*. Contact-pieces *m n* are included between contacts *k l*, so as to be opposite springs *g h*, respectively. Contact *q* is included between contacts *o p*, so as to be opposite the springs *g h* on the other side of the slot from contacts *m n*. The contacts *o p* are respectively opposite springs *e f* and on the opposite side of the slot from contacts *k l*. The contacts are thus brought within the smallest compass possible and in such relation to the movable contact-spring that an instrument connected between contact *p n* and contact *o m* may be readily looped into either one of two circuits *t* or *u* without leaving either of said loops open.

As shown in Fig. 5, the movable contacts *e f* and *g h* are connected with fixed contacts *e' f'* and *g' h'*, respectively, by the spiral springs *e² f²* and *g² h²*.

5 A little slack in the connecting-wires of the circuits, it is evident, would make the spiral-coils unnecessary.

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

1. The combination, with the contact-piece *k l*, of the contacts *m n*, included between the outer portions of piece *k l*, the contact *q*, opposite contacts *m n* and between contacts *o p*,
15 placed opposite, respectively, to the outer portions of contact-piece *k l*, contacts *m o*, and also contacts *n p*, being permanently connected together, and movable contacts *e f* and *g h*, adapted to be moved together from the
20 contacts on one side to the contacts on the other side thereof, substantially as and for the purpose specified.

2. A circuit-changing device consisting in the combination, with the pivoted block carrying the four contact-pieces in the same
25 plane, of a rubber block provided with a slot through which the free ends of said springs are inserted, contacts arranged upon the op-

posite edges of said slot, a spring for holding the contact-springs against the contacts on
30 one edge, and a push-key for overcoming the resistance of said spring and moving the block on its pivot to separate the contact-springs from one line of contacts and close
35 said springs upon the other line or set of contacts on the opposite side of the slot, substantially as and for the purpose specified.

3. The combination, with the circuit *t*, connected with movable springs or contacts *g h*, of the circuit *u*, connected with the springs or
40 movable contacts *e f* of a circuit including an electrical instrument connected between the contacts *p n* and *o m*, the contact-piece *k l*, and the contact-piece *q*, the movable contacts
45 *e f* and *g h* being in the same line or plane and adapted to be moved from contacts *k l m n* on one side to contacts *o p q* on the other, whereby the electrical instrument may be
50 looped into circuits *t u*, alternately, without leaving either of said circuits open.

In witness whereof I hereunto subscribe my name this 8th day of September, A. D. 1888.

WILLIAM M. GOODRIDGE.

Witnesses:

GEORGE P. BARTON,
CHAS. G. HAWLEY.