(No Model.)

W. E. PARKER & H. E. TEMPLE.

ELECTRIC SWITCH.

No. 422,147. Patented Feb. 25, 1890.

Fig. 1.

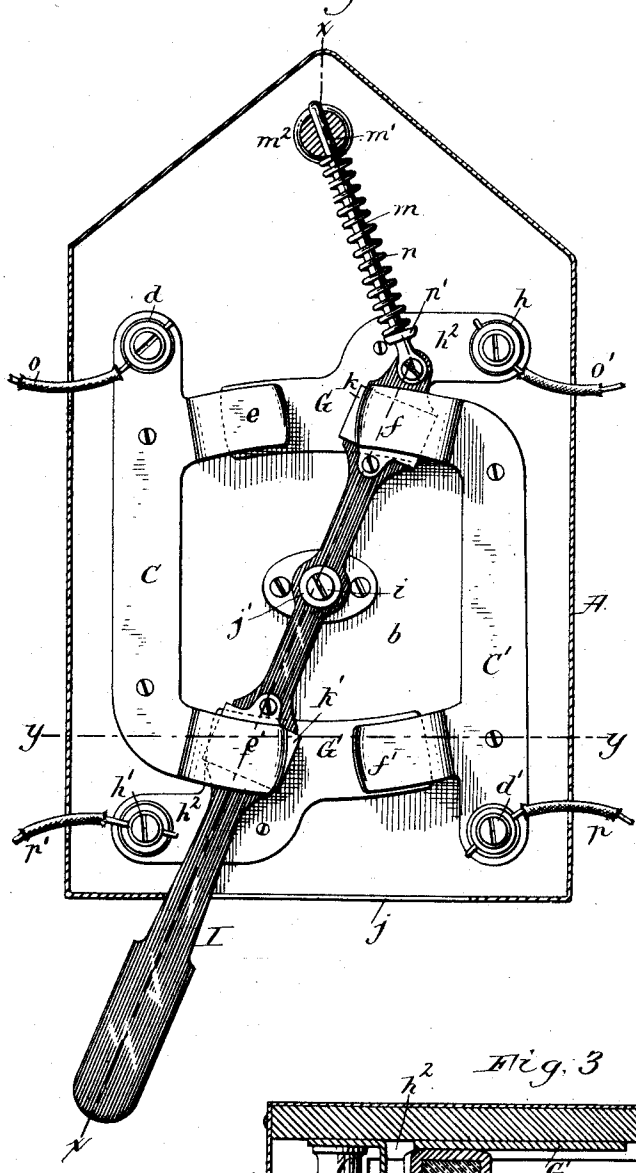


Fig. 2.

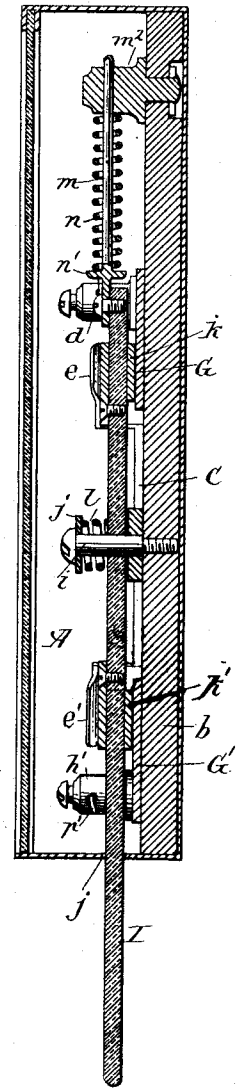
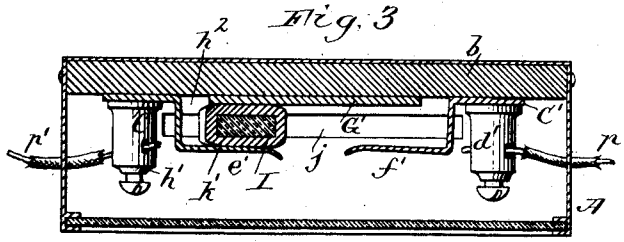


Fig. 3



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UNITED STATES PATENT OFFICE.

WILLIAM E. PARKER AND HARRY E. TEMPLE, OF BUFFALO, NEW YORK, ASSIGNORS OF ONE-HALF TO HENRY H. HUMPHREY, OF SAME PLACE.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 422,147, dated February 25, 1890.

Application filed November 15, 1889. Serial No. 330,475. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM E. PARKER and HARRY E. TEMPLE, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have jointly invented new and useful Improvements in Electric Switches, of which the following is a specification.

This invention relates to an electric switch which is more particularly adapted for use on arc circuits for cutting out one or more lamps or lights without affecting the other lamps on the circuit.

Our invention has for its object to produce a reliable and inexpensive switch of simple construction, in which the tendency to spark in switching is reduced to a minimum, so as to avoid burning out of the switch and guard against danger by fire.

Our invention consists of the improvements which will be hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of our improved switch with the cover removed from the inclosing-case. Fig. 2 is a vertical section of the switch in line x x, Fig. 1. Fig. 3 is a horizontal section in line y y, Fig. 1.

Like letters of reference refer to like parts in the several figures.

A represents the box or inclosing-casing of the switch, preferably constructed of iron or other non-combustible material, and b is a non-combustible base-plate secured to the back plate of the inclosing-case. This base-plate consists, preferably, of slate, china, or other non-combustible material.

C C′ represent two terminal conducting-plates secured to the base-plate b at a short distance from each other, and d d' are binding-posts connected, respectively, with said terminal plates.

e e' represent two inwardly-projecting contacts arranged at or near opposite ends of the terminal plate C, and f f' are two similar contacts arranged on the other terminal plate C′, directly opposite the contacts e e', each pair of opposing contacts being separated by an intervening space, as shown.

G represents a contact-plate arranged opposite the upper pair of contacts e f and bridging the space between said contacts, and G′ is a similar contact-plate arranged opposite the lower pair of contacts e' f'. The contacts e e' f f' are raised, as shown, so as to overhang the contact-plates G G′ without touching the same. These contact-plates and terminal plates are secured to the base-plate b by screws or other means.

h h' represent binding-posts connected with outward extensions h^2 of the contact-plates G G′.

I represents a switch-lever mounted between its ends upon a pivot i, secured to the base-plate b and projecting with its outer end or handle through a slot j in the bottom of the casing A. This switch-lever is constructed of vulcanized fiber or other non-conducting material.

k k' represent contacts arranged on the switch-lever on opposite sides of its pivot in line with the contacts e e' f f', so that upon swinging the switch-lever in one or the other direction the contacts of the lever will engage under diagonally-opposite contacts of the terminal plates C C′. The terminal contacts possess sufficient elasticity to form a reliable contact.

Each switch-contact k k' consists of a metallic band surrounding the lever, so as to establish a connection between the contact-plates G G′ and one of the adjacent overhanging contacts. The contacts of the switch-lever are held closely against the contact-plates G G′ by a spiral spring l, surrounding the pivot of the lever and interposed between the lever and a washer or shoulder j', arranged at the outer end of the pivot, as clearly represented in Fig. 2.

m represents a shifting-rod pivoted at or near its inner end to the adjacent inner end of the switch-lever and passing loosely with its outer end through an opening m', formed in an oscillating stud m^2. The latter is pivoted to the base-plate b, above the switch-lever, by a cylindrical shank formed on the stud and confined in an opening in the base-plate, as shown in Fig. 2.

n represents a spiral spring surrounding the rod m and bearing at one end against the stud m^2 and at its opposite end against a collar or shoulder n', formed at the inner end of

the shifting-rod *m*. The spring *n* holds the switch-lever at either extremity of its movement, and also serves to quickly shift the lever from one set of contacts to the other as soon as the lever has passed the dead-center, or, in other words, a line passing through the pivot of the lever and the oscillating stud. Upon shifting the lever the free end of the rod *m* moves outwardly through the oscillating stud, causing the spring to be compressed. As soon as the lever has passed the dead-center the spring reacts and throws the lever to the extreme of its movement in the direction in which it is being shifted.

o o' represent the ends of the main line, which are attached, respectively, to the binding-posts of the terminal plate C and contact-plate G.

p p' are the branch wires leading to the lamps, and connected, respectively, to the binding-posts of the other terminal plate C' and contact-plate G'.

In the position of the switch-lever represented in Fig. 1 the lamp-circuit is looped in the main circuit, the current passing from one side *o* of the main wire through the binding-post *d*, terminal plate C, contact *e'*, switch-lever contact *k'*, contact-plate G', binding-post *h'*, branch wires *p' p*, binding-post *d'*, terminal plate C', contact *f*, switch-lever contact *k*, contact-plate G, and binding-post *h* to the opposite side *o'* of the main line. Upon shifting the switch-lever to its opposite position the connection between the contact *e'* of the terminal plate C and the lower contact *k'* of the switch-lever is broken and the lamp is cut out of the main circuit, the current passing by a short circuit from one side *o* of the main line directly to the opposite side thereof through the binding-post *d*, terminal plate C, contact *e*, lever-contact *k*, contact-plate G, and binding-post *h*.

The opposing contacts *e f* and *e' f'* are arranged so closely together that upon shifting the lever the movable switch-contacts *k k'* will come in contact with one set of diagonally-opposite contacts before leaving the other set.

By the relative arrangement of the contact-plates G G', contacts *e e' f f'*, and movable switch-contacts *k k'* a constant connection is maintained between the contact-plates G G' and one or the other set of contacts *e e' f f'*, thereby insuring the making of one circuit before breaking the other, and avoiding as much as possible the generation of sparks or arcs between the adjacent contacts. This arrangement also renders it impossible to place the switch in a position to leave the main line open. The spring *n* rapidly shifts the switch-lever to either extreme of its movement immediately upon passing the dead-center, and thus avoids the liability of placing the lever in an improper position.

In the drawings the ends of the line-wire are represented as being attached to the upper pair of binding-posts *d h*, and the ends of the branch or lamp wires to the lower pair of binding-posts *h' d'*; but, if desired, this arrangement may be reversed, or the line-wires may be connected with the posts *h d'*, and the branch or lamp wires with the opposite posts *d h'*, or vice versa, it being only necessary to connect the ends of the same wire to adjacent posts. This is a desirable feature of our switch, as by this arrangement unskilled persons are not apt to improperly connect the wires to the switch.

The terminal plates C C' and the contact-plates G G' are duplicates of each other, being only reversed, which greatly simplifies the construction of the switch and enables it to be produced at comparatively small cost.

We claim as our invention.—

1. The combination, with the terminal plates, each provided with a pair of contacts, the contacts of one plate being arranged opposite those of the other plate, of contact-plates arranged adjacent to the opposing pairs of contacts, and movable contacts having constant connection with said contact-plates and adapted to engage with diagonally-opposite contacts of the terminal plates, substantially as set forth.

2. The combination, with the terminal plates, each provided with a pair of contacts, the contacts of one plate being opposite those of the other plate, of contact-plates arranged opposite the opposing pairs of contacts of the terminal plates and extending across the space between said contacts, and a switch-lever having contacts bearing constantly against said contact-plates and establishing a connection between the contact-plates and one of the adjacent contacts of the terminal plates, substantially as set forth.

3. The combination of two terminal plates, each provided with a pair of contacts, the contacts of one plate being opposite those of the other plate, contact-plates arranged opposite the opposing pairs of contacts of the terminal plates and extending across the space between said contacts, a switch-lever having contacts bearing constantly against said contact-plates, and a shifting-spring whereby the lever is thrown to either extremity of its movement upon passing the dead-center, substantially as set forth.

4. The combination, with two terminal plates, each provided with a pair of contacts, the contacts of each plate being opposite those of the other plate, of contact-plates arranged opposite the opposing pairs of contacts of the terminal plates and extending across the space between said contacts, a switch-lever having contacts bearing constantly against said contact-plates, an oscillating stud arranged opposite the inner end of the switch-lever, a shifting-rod pivoted at one end to the switch-lever and passing loosely with its opposite end through an opening in the oscillating stud, and a spring arranged upon the shifting-rod between said stud and the switch-lever, substantially as set forth.

5. The combination, with two terminal plates, each provided with a pair of contacts, the contacts of one plate being opposite those of the other, of contact-plates arranged opposite the opposing pairs of contacts of the terminal plates and extending across the space between said contacts, a switch-lever having contacts bearing constantly against said contact-plates, and a spring whereby the switch-lever is pressed against the contact-plates, substantially as set forth.

Witness our hands this 9th day of November, 1889.

WILLIAM E. PARKER.
HARRY E. TEMPLE.

Witnesses:
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