(No Model.)

O. S. BUSSMANN.

SWITCH AND CUT-OUT FOR ELECTRIC LIGHTS AND OTHER ELECTRICAL DEVICES.

No. 397,109. Patented Feb. 5, 1889.

Fig: 2.

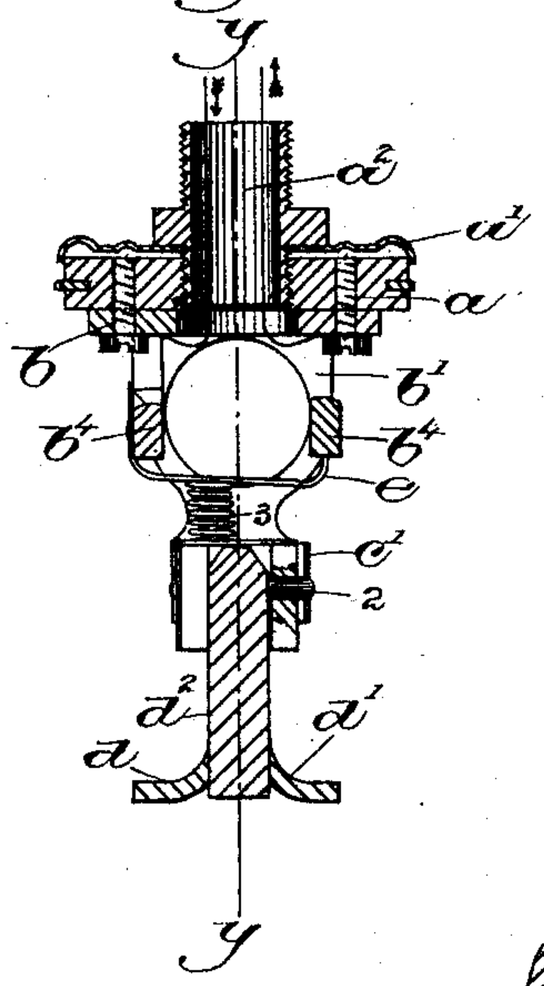


Fig: 4.

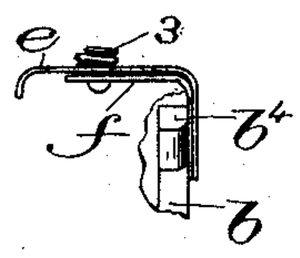


Fig: 5.

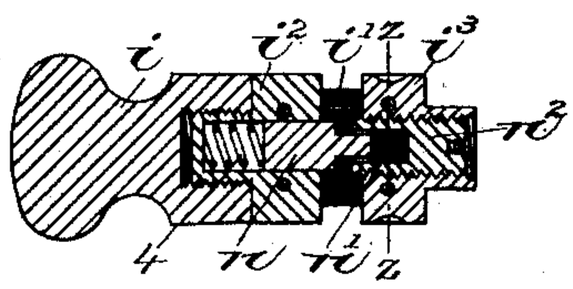


Fig: 3.

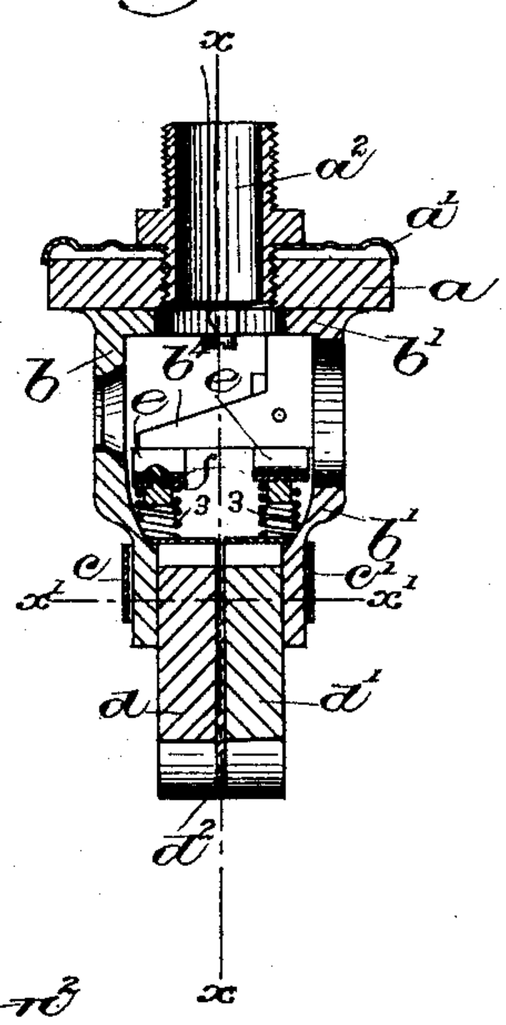


Fig: 1.

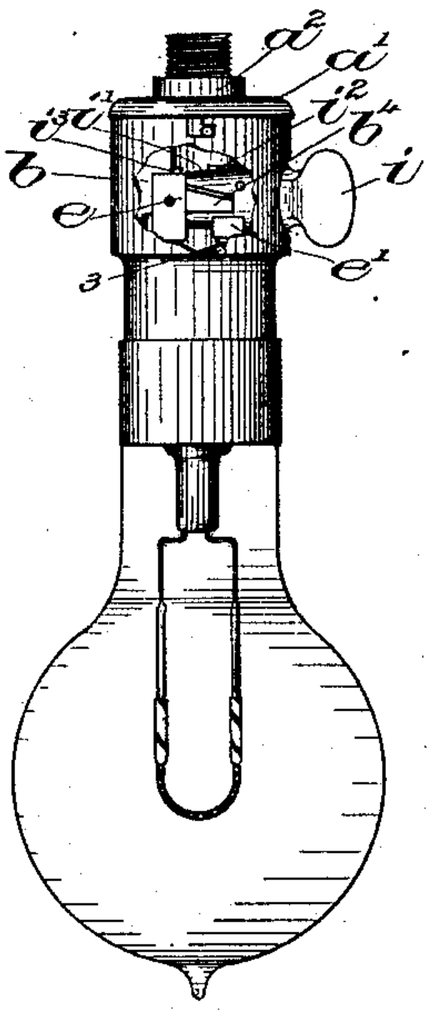


Fig: 6.

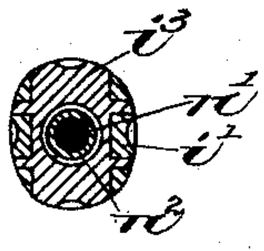
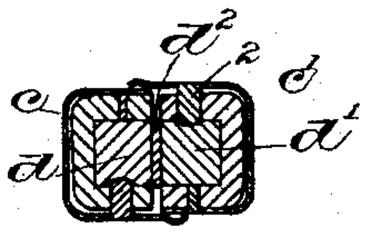


Fig: 7.



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UNITED STATES PATENT OFFICE.

OSCAR S. BUSSMANN, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR TO THE BERNSTEIN ELECTRIC LIGHT MANUFACTURING COMPANY, OF PORTLAND, MAINE.

SWITCH AND CUT-OUT FOR ELECTRIC LIGHT AND OTHER ELECTRICAL DEVICES.

SPECIFICATION forming part of Letters Patent No. 397,109, dated February 5, 1889.

Application filed October 12, 1887. Serial No. 252,122. (No model.)

To all whom it may concern:

Be it known that I, OSCAR S. BUSSMANN, of Hamburg, Germany, but temporarily residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Switches and Cut-Outs for Electric Light and Other Electrical Devices, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to construct an electric switch and cut-out for incandescent electric lamps, whereby the lamps may be employed in series in a normally-closed circuit, and at all times the continuity of the circuit is preserved.

In accordance with this invention the ends of the filament are electrically connected with two conducting-plugs properly joined together and insulated from each other to form, in connection with one or more yielding contact-springs, a plug-switch. These yielding contact-springs, two being herein shown, are attached to two posts and adapted to lap over upon each other, or upon each post making a good contact when not moved away by the plug-switch, said posts being attached independently to an insulating base-plate. The line-current passes through said posts and, when the plug-switch is removed, through these yielding contact-springs; but when the said plug-switch is placed in position the current passes through the two parts of the plug and the filament. Thus an automatic switch is provided to preserve the continuity of the circuit when the bulb containing the filament is removed. Each of said posts is also provided with another yielding contact-spring, each said spring being adapted to touch an integral part of the opposite post to which it is attached, and a rotatable cut-out switch is provided having conducting and insulating surfaces which co-operate with these contact-springs, said cut-out switch being of oval shape in cross-section, and when in one position permitting the said contact-springs to remain in contact, thereby shunting out the plug-switch and its electric connections, and hence maintaining the continuity of the circuit, the filament being shunted out. When the cut-out switch is in another position, the said contact-springs are lifted free from contact, thereby opening the shunt and permitting the current to pass through the filament. By this cut-out switch the lamps may be arranged in series in a normally-closed circuit, and by simply rotating said switch may be cut in or out. To provide against opening the line in case of breakage of any lamp, the said cut-out switch is provided between its conducting-surfaces with a spring-controlled contact-maker normally bearing upon some fusible material of high resistance, and when the lamp breaks the line-current passes through said resistance, no other path being offered, thereby maintaining the shunt for the lamp, and said resistance, immediately fusing, permits the spring-controlled contact-maker to insure better electric connection between the two conducting-surfaces, thereby more surely preserving the continuity of the line.

Figure 1 shows in elevation an incandescent lamp embodying this invention, a portion of the inclosing-case being broken away to more fully show the switches and contact-springs; Fig. 2, a vertical section of the parts contained within the lamp-carrying socket, taken on the dotted line $x\ x$, Fig. 3, looking toward the right; Fig. 3, a vertical section of the parts contained within the lamp-carrying socket, taken on the dotted line $y\ y$, Fig. 2, looking toward the left; Fig. 4, a detail of one of the contact-springs to be referred to; Fig. 5, a longitudinal section of the cut-out switch; Fig. 6, a cross-section of the cut-out switch, taken on the dotted line $z\ z$, Fig. 5; and Fig. 7, a cross-section of the plug-switch shown in Fig. 3, taken on the dotted line $x'\ x'$.

The insulated base a has secured to it an ornamental cap, a', by a flanged tubular nipple, a^2, externally screw-threaded to support the lamp. Two conducting posts or standards, $b\ b'$, are attached to the insulated base-plate a, to which posts the line is connected. To the outer or lower end of each post $b\ b'$ a contact-spring, $c\ c'$, is attached, which passes

around its respective post, as shown in Fig. 7, and laps over upon and touches the contact-spring of the opposite post, or it may be the post itself. The outer end of each spring is provided with a pin, 2, (see Fig. 2,) which passes through a hole cut through the post, the said pins terminating in an opening or space between the two posts. Two plugs, *d d'*, having beveled ends and joined together, but separated by a piece of insulating material, d^2, are adapted to enter the opening or space between the two parts, and in their movement strike the pins 2 and force them outward, as shown in Fig. 2, thereby breaking the contact normally made by the springs *c c'*. The ends of the filament of the lamp are connected with the said two-part plug-switch *d d'*. Two contact-springs, *e e'*, are attached, respectively, to the two posts *b b'*, the outer ends of said contact-springs being normally pressed by springs 3 against an arm, b^4, of each post, or against an integral or other part of each post, to thereby make electrical connection, shunting out the plug-switch and its electric connections.

The posts *b b'* have openings which receive a cut-out switch (see Figs. 5 and 6) made essentially of insulating material, preferably oval in cross-section. The cut-out switch consists of a handle portion, *i*, and a shank composed of two pieces of insulating material, *i'*, having two conducting portions, i^2 i^3, placed between them. The plug when in one position presents the insulated portions *i'* to the contact-springs *e e'*, and by its oval shape permits the contact-springs to retain their contact and preserve the shunt; but when said plug is partially rotated the conducting portions are presented to the said contact-springs, and by the oval shape of the plug they are lifted free from contact, thereby opening the shunt and permitting the current to pass through the plug-switch *d d'* and its electric connections, or, if said plug-switch *d d'* is removed, through the contact-springs *c c'*. It will thus be seen that normally the line-current passes through the shunt for the filament, and that by simply partially rotating the cut-out switch the shunt is broken and the current passes through the filament, thereby at all times preserving the continuity of the closed circuit.

A locking-spring, *f*, is attached to one of the springs, as *e*, said spring having at its end a projection which enters a small recess cut in the shank of the cut-out switch to thereby center it.

Were it not for the fact that the lamps frequently break, the construction thus far described would subserve the purposes desired, and to provide for such accidents and maintain the continuity of the line the cut-out switch is socketed to receive a movable contact-maker, *n*, normally pressed by a spring, 4, against some material, *n'*, of high resistance contained in a socket of a plug, n^2, screwed into the socket of the switch.

The part *n* is in electrical contact with the part i^2, and the part n^2 is in electric contact with the part i^3; but the resistance separating the parts *n* n^2 is so high that the current follows the better path offered, it being understood, of course, that a minimum amount passes through the resistance, which has no effect upon it.

The material *n'* is easily fusible or reducible, and when a lamp breaks the only path offered for the current is through the said material, and it, fusing or reducing, permits the contact-maker *n* to make a good contact with n^2, being pressed against it by the spring 4.

I do not herein broadly claim such spring-controlled contact-maker normally resting against material of high resistance, which latter, upon being fused, reduced, or decomposed, permits the contact-maker to operate.

It is obvious that only one contact-spring, as *c*, and one, as *e*, need necessarily be used, the two being herein shown for safety.

It is obvious that any other electric device may be controlled by the switch herein shown without departing from this invention.

I claim—

1. The posts *b b'* and the contact-spring attached to the outer end of one of the said posts and adapted to make contact with the other, as described, combined with the two-part plug-switch *d d'*, adapted to co-operate with the said spring, substantially as described.

2. The posts *b b'* and the contact-spring attached to the outer end of one of said posts and adapted to make contact with the other, and the two-part plug-switch *d d'*, combined with another contact-spring attached to one of the said posts and adapted to make contact with the other, serving as a shunt for the first-named contact-spring, and a switch for moving said contact-spring to open and close the shunt, substantially as described.

3. The posts *b b'*, the contact-spring, as *c*, having the pin 2 passing through a hole in the post, as described, combined with the two-part plug *d d'*, having the beveled end, substantially as described.

4. The posts *b b'*, the arm b^4, and the contact-spring, as *e*, combined with the rotatable cut-out switch having conducting and insulating parts and a resistant, as *n'*, substantially as and for the purposes described.

5. In an incandescent lamp, the two-part plug-switch, the filament supported by it, and the frame or holder in which the said plug-switch is placed, combined with the rotatable cut-out switch for the plug-switch, said rotatable cut-out switch having conducting portions separated by a resistance, as *n'*, to operate substantially as and for the purpose set forth.

6. In an incandescent lamp, the filament and the support, combined with the cut-out switch for the filament, it comprising conducting portions and a material of compara-

tive high resistance, as n', which serves as a shunt of high resistance for the filament, but through which the current may pass should the filament be broken or otherwise destroyed, thereby at all times maintaining the continuity of the circuit in which the lamp is placed, substantially as described.

7. The posts b b', the contact-spring, as e, and the locking-spring, combined with the rotatable cut-out switch, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OSCAR S. BUSSMANN.

Witnesses:

BERNICE J. NOYES,

B. DEWAR.