(No Model.)

W. F. SMITH.

CUT-OUT FOR ELECTRIC LAMPS.

No. 435,049. Patented Aug. 26, 1890.

Fig. 1.

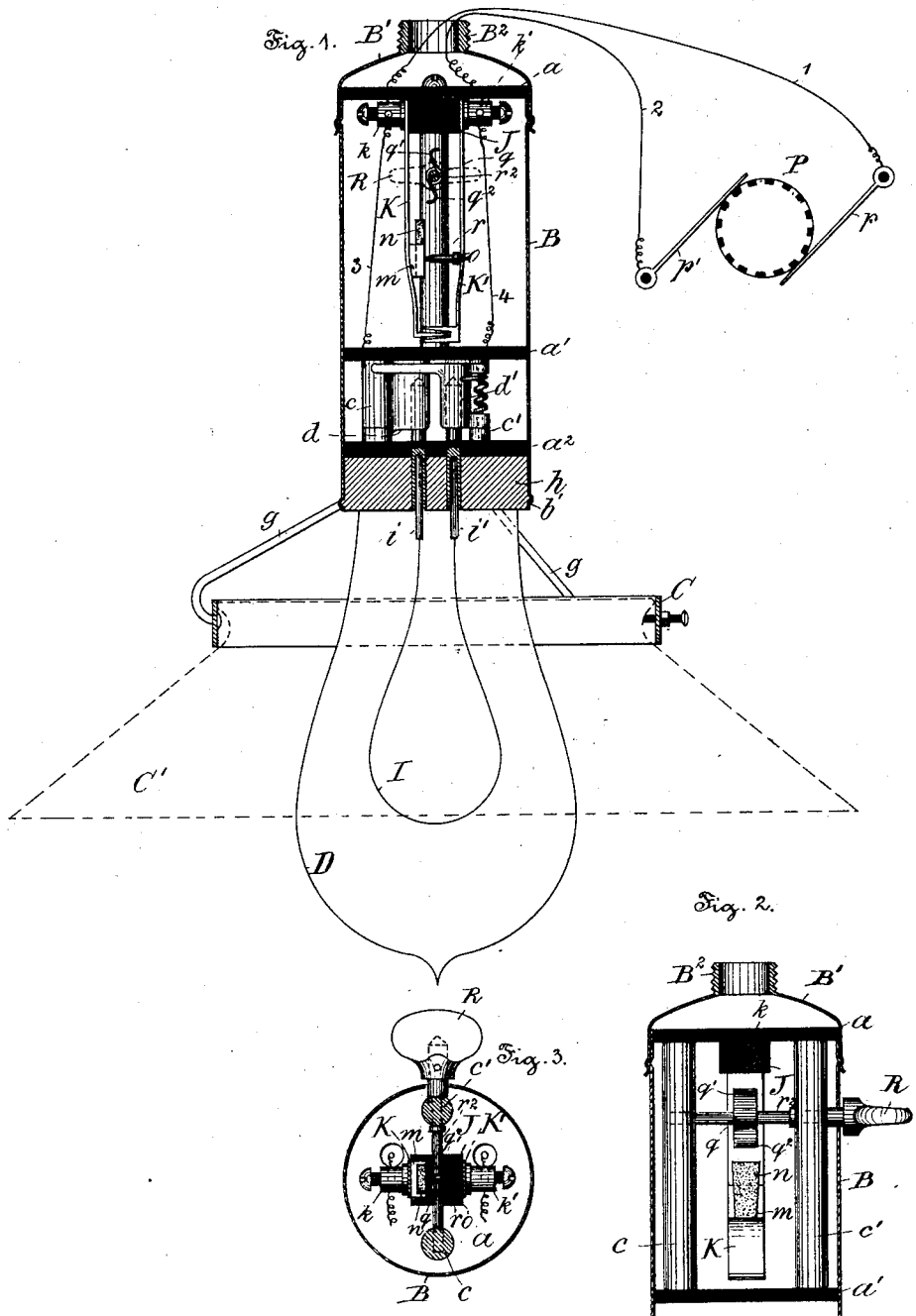


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

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CUT-OUT FOR ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 435,049, dated August 26, 1890.

Application filed May 26, 1890. Serial No. 353,145. (No model.)

To all whom it may concern:

Be it known that I, WALTER F. SMITH, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Cut-Outs for Electric Lamps, of which the following is a specification.

My invention relates to a thermal cut-out device for use in connection with series incandescent electric lighting with a current of high electro-motive force, although it is not necessarily confined to the series incandescent system, as it may be used in connection with the arc system of electric lighting.

The principal objects of my invention are, first, to provide a sensitive cut-out device for electric circuits simple, durable, and positive in action; second, to provide a cut-out device which, in the event of the filaments or pencils of two or more lamps arranged in series being broken or otherwise destroyed, will short-circuit the electric current and automatically cut the lamp to which it is attached out of the dynamo or generator circuit, and, third, to provide a cut-out arranged so that the parts thereof may be readily readjusted without interrupting the dynamo or generator circuit when the defect in the lamp which caused the cut-out to operate is remedied.

My invention consists of an automatic cut-out for electric lamps constructed and the parts thereof arranged in the manner hereinafter described.

The nature and particular features of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a view, partly in elevation and partly in section, of an incandescent electric lamp and its holder, showing my invention in application thereto. Fig. 2 is a vertical sectional view through the housing of a lamp-holder, showing one of the spring-metal plates or strips of the cut-out, with a ribbon, sheet, or block composed of a high-resisting material or materials adjustably supported thereby, and showing also the manual switch or key for cutting out the current to the filament or short-circuiting the lamp in application to an incandescent lamp; and Fig. 3 is a transverse sectional view through the housing of a lamp-holder, showing the cut-out device in application and the manual switch or key for short-circuiting the lamp.

Referring to the drawings, a, a', and a^2 are insulating disks or plates disposed within and fitting snugly against the housing B and made of any preferred material. These insulating disks or plates support the vertical arms c and c', and also the spring-actuated clamps d and d', for supporting the bulb D in proper position.

To the upper part of the housing B is suitably attached a cover or cap B′, having formed, preferably, integral therewith an externally-threaded thimble B^2. To the lower part of the housing B are secured arms g, connected at their opposite extremities to a supporting device C, to which is clamped a shade C′.

D is a glass or other preferred form of bulb provided at its upper extremity with a ribbed block h, which fits into the interior recessed wall b' of the housing B. In this block are formed apertures which extend therethrough. The terminals i and i' of the filament I, suspended within the bulb D, extend through the apertures of the block h, and are arranged so as to contact with and be held in position by the spring-actuated clamps d and d', located between the disks or plates a' and a^2 in the housing B.

J is an insulating-block supported from the insulating disk or plate a. K and K′ are spring-metal or other preferred form of strips held up against said insulating-block J by means of the binding-posts k and k'. These strips K and K′, depending from said insulating-block J, are provided, respectively, with forked and angular projections, the latter being arranged so as to extend between the forked extremity of the depending arm or strip of spring metal K′ and to engage with the base portion thereof. The depending metallic strip K is provided with a recessed seat m, as clearly shown in Figs. 1 and 3, and

this seat m is adapted to receive a ribbon or sheet n, formed of a substance or materials of high electrical resistance readily melting or softening at a low temperature—such as a composition or compound of graphite and rubber, or shellac and graphite, or of graphite, rubber, and sulphur, or other preferred substances or materials. This ribbon or sheet of low conductivity or high electrical resistance is fitted into the recessed seat m, and is arranged so as to be slid along the seat in any preferred manner. To the spring-metal strip or depending arm K′ is suitably secured a socket or thimble o, into which is rigidly fitted a lateral pin r, arranged to normally bear against the ribbon or sheet n, supported in the seat of the spring-metal strip or depending arm K.

P is a dynamo or other source of electric energy, and p and p' are the commutator-brushes thereof.

1 and 2 are the leading-in wires from the source of electric energy to the binding-posts k and k'. 3 and 4 are the conductors from said binding-posts to the spring-actuated clamps d and d'.

R is a switch plug or key mounted on a spindle or shaft r^2, extending through the vertical arms c and c', and on this spindle or shaft is mounted a collar q, provided with two curved spring-metal strips or wings q' and q^2, adapted to contact with the metal strips or depending arms K and K′ by the movement of the switch plug or key R by hand, and thus to not only short-circuit the filament I, but also to extinguish the lamp, the current passing in such instance from the dynamo or generator or other suitable source of electric energy by the commutator-brush p to the leading-in wire 1, to the binding-post k and spring-metal strip K across the curved wings or springs q' and q^2 of the collar q, mounted on the shaft or spindle r^2, to the spring-metal strip or depending arm K′, thence to the binding-post k', the conductor 2, to the commutator-brush p', to the source of electric energy.

The mode of operation of the cut-out device hereinbefore described is as follows: The ribbon or sheet n is first caused to assume a position, as shown in Figs. 1 and 3, with the switch or key R also assuming the position as therein indicated, and afterward the lamp is adjusted and interposed in the dynamo or generator circuit in the usual or in any other preferred manner. The electric current entering the lamp will be shunted, one part of the current of the generator-circuit passing through the commutator-brush p and leading-in wire 1 to the binding-post k, then to conductor 3, the spring-actuated clamp d, terminal i, then through the filament and terminal i', the spring-actuated clamp d', the conductor 4, binding-post k', the conductor 2, and commutator-brush p', to the dynamo or other source of electric energy. In the event of the filament being broken or otherwise injured the shunt-current will greatly increase in intensity, and the ribbon or sheet n, held in the recessed seat m of the spring-metal strip or depending arm K, will, by reason of its high electrical resistance, become heated, melted, or softened sufficiently to permit of the fixed pin r, mounted in the opposing spring-metal strip or depending arm K′, to penetrate said ribbon or sheet n, thereby forming a contact between said fixed pin r and the spring-metal strip K, whereby the angular and forked extremital parts of said spring-metal strips will make contact, so that the current will be short-circuited and the lamp cut out of the dynamo or generator circuit.

To readjust the cut-out device when the broken or otherwise injured filament I has been replaced by a new one, the ribbon or sheet n may be simply moved forward, so that the pin will again rest against another part or portion of said ribbon or sheet n, or when entirely used up another may be readily inserted by the removal of the housing in any convenient manner.

With the switch plug or key R in the position as is illustrated in Fig. 1, the dynamo or generator current through the several parts of the lamp will be as above described, while, on the other hand, by the simple movement of the switch-plug so as to bring the wings or curved springs q' and q^2 into contact with the surface of the spring-metal strips or depending arms K and K′ the dynamo or generator current will be shunted through the lamp from the binding-post k, spring-metal strip K, wings q' and q^2 of the switch plug or key R, spring-strip K′, and binding-post k', back again to the source of electric energy, as will be readily and fully understood.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a circuit and connections, two spring-metal strips tending to establish a short circuit, a pin rigidly attached to one of said strips, and a ribbon or sheet of high-resisting material or materials, but melting or softening at a comparatively low temperature, contacting with said pin and normally preventing the establishment of the short circuit, substantially as described.

2. The combination of a circuit and connections, two depending spring-metal strips having, respectively, bifurcated and angular projections, a pin rigidly attached to one of said strips, and a ribbon or sheet of high-resisting material or materials readily melting or softening mounted on the other strip, and said pin held normally in contact with said ribbon or sheet, substantially as and for the purposes described.

3. The combination of a circuit and connections, two supported depending metal strips adapted to contact with each other to

establish a short circuit, a pin rigidly attached to one of said strips, and a ribbon or sheet of resisting material melting or softening at a comparatively low temperature, adjustably connected with the other of said strips, substantially as and for the purposes described.

4. The combination of a circuit and connections, two depending spring-metal strips provided, respectively, with forked and angular projections, an insulating-block interposed between said strips, a pin rigidly attached to one of said strips, and a ribbon or sheet of a high-resisting material, but melting or softening at a comparatively low temperature, adjustably attached to the other of said strips, substantially as and for the purposes described.

5. The combination, with a circuit and connections, two depending springs adapted to establish a short circuit, a pin rigidly attached to one of said strips, and a ribbon or strip of high-resisting material or materials, but melting or softening at a comparatively low temperature, adjustably connected with the other of said strips, of a bulb and its filament, spring-actuated clamping devices adapted to support the terminals of said filament, and a housing inclosing said parts, substantially as and for the purposes described.

6. The combination of a circuit and connections, two spring-metal strips adapted to establish a short circuit, a pin rigidly secured to one of said strips, a ribbon or sheet of high-resisting material or substances melting or softening at a low temperature attached to the other of said strips, a housing provided with deflecting-arms, and a shade-supporting device and the housing having a movable cap or cover provided with a thimble, substantially as and for the purposes described.

7. In combination, an electric-lamp cut-out device having two depending spring-metal strips, a source of electric energy and circuit, a pin rigidly attached to one of said strips, a ribbon or sheet of resisting material melting or softening at a low temperature, mounted in a recessed seat secured to the other of said strips, and a switch plug or key provided with wings and adapted to contact with said strips, substantially as and for the purposes described.

8. In combination, an electric-lamp cut-out device having two depending spring-metal strips adapted to establish a short circuit, a source of electric energy and circuit, a pin rigidly attached to one of said strips, a ribbon or sheet of high resistance, but melting or softening at a low temperature, adjustably mounted in a recessed seat secured to the other of said strips, and a switch-plug provided with a collar having curved wings mounted on a spindle, said wings adapted to contact with said strips, substantially as and for the purposes described.

9. The combination of a circuit and connections, two depending metal strips provided, respectively, with forked and angular projections adapted to establish a short circuit, an insulating-block interposed between said strips, a pin fixed to one of said strips, and a ribbon or sheet of high-resisting material, but melting or softening at a comparatively low temperature, held in a seat connected with the other of said strips, substantially as and for the purposes set forth.

10. The combination of a circuit and connections, two depending spring-metal strips adapted to establish a short circuit, a pin rigidly secured into one of said strips, a ribbon or sheet of high-resisting material, but readily melting or softening, adjustably secured to the other of said strips, a bulb and filament, clamping devices for supporting the terminals of said filament, and a housing provided with a removable cap surrounding said parts, substantially as and for the purposes described.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

WALTER F. SMITH.

Witnesses:
THOMAS M. SMITH,
GEO. W. REED.