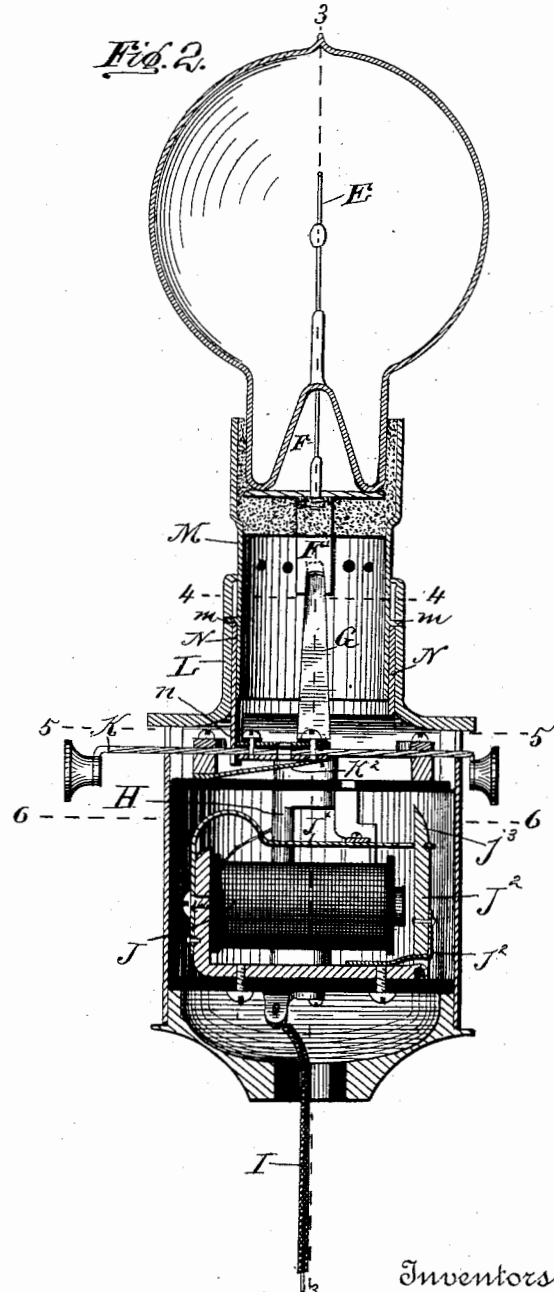
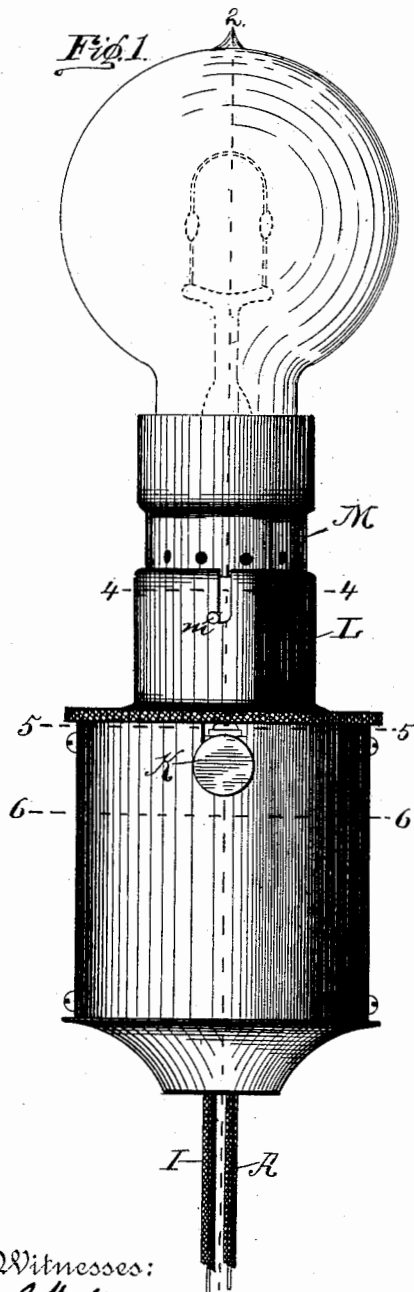


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ELECTRIC LAMP SOCKET.

No. 385,436.

Patented July 3, 1888.



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# UNITED STATES PATENT OFFICE.

JOHN S. ADAMS AND ALBERT W. MORRELL, OF INDIANAPOLIS, INDIANA,  
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## ELECTRIC-LAMP SOCKET.

SPECIFICATION forming part of Letters Patent No. 385,436, dated July 3, 1888.

Application filed April 10, 1888. Serial No. 270,167. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN S. ADAMS and ALBERT W. MORRELL, citizens of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Incandescent Electric Lamps, of which the following is a specification.

Our invention is particularly adapted for use with incandescent electric lamps when the same are used in series; and it consists in such a construction of the lamp that the positive cut-out switch thereto shall serve to lock the lamp proper securely in its socket and render it incapable of being removed therefrom while the lamp is in circuit, and also prevent the re-engagement of the displaced portion of the automatic cut-out switch after it has been released, and the lamp short-circuited by the operation of the energized shunt-magnet, except when the positive cut-out switch is in position to form part of the circuit.

It further consists in certain details of construction, all as will be hereinafter more particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a side elevation of an incandescent electric lamp and its socket provided with the switch and cut-out embodying our said invention; Fig. 2, a longitudinal section of the same looking toward the left from the dotted line 2 2 in Figs. 1 and 3; Fig. 3, a similar section looking toward the left from the dotted line 3 3 in Fig. 2; Fig. 4, a horizontal sectional view on the dotted line 4 4; Fig. 5, a horizontal sectional view looking downwardly from the dotted line 5 5; Fig. 6, a horizontal sectional view looking downwardly from the dotted line 6 6; Fig. 7, an end elevation of the switch, the shunt-magnet, and adjacent parts, and Fig. 8 a central sectional view of the sleeve N. These drawings are made substantially full size of one size of lamp, and those portions showing insulating material in section are shaded solid black.

In said drawings, the portion marked A represents the incoming line-wire of an incandescent electric lamp; B, one side of the frame-work supporting the switch and shunt-

magnet; C, contact-springs attached to said frame side; D, the wire running into the lamp and attached to the carbon therein; E, said carbon; F, the wire running from said carbon to outside the lamp; G, other contact-springs similar to the springs C; H, a portion of the frame-work similar to the frame side B; I, the outgoing line-wire; J, an electro-magnet set into a shunt-circuit forming part of the automatic cut-out; K, the positive cut-out switch; L, the lamp-socket; M, the shank of the lamp, which enters said socket; and N, a sleeve which is interposed between the shank of the lamp and the socket, whereby said shank and said socket are locked together, when the lamp is in circuit, by means of the positive cut-out switch, as will be hereinafter more particularly described.

The socket L is slotted in from the edge, as shown in Fig. 1, and there are notches in one side of each of the slots, into which small pins *m* on the shank M of the lamp enter. The sleeve N is slotted similarly to the socket L, except that there are no notches in the sides of the slots, (see particularly Fig. 8,) and before the pins can be inserted in the slots in the socket L the slots in the sleeve N must register therewith, and there being no notches in the slots in said sleeve, when the lamp-shank is turned so that the pins thereon enter the notches in the socket L, the sleeve is turned therewith, and thus the slots in-said sleeve are covered by the portions of the socket which are above the notches therein, and the pins *m* are held from being withdrawn from their engagement until the sleeve is turned back, so that the slots therein register with the slots in the socket. Said sleeve N has upon one side a portion, *n*, which projects down, (see Figs. 2, 3, and 8,) and, being bifurcated at its lower end, passes astride the main bar of the switch K. Said switch-bar has a notch, *k*, (see Fig. 5,) in one side, into which, when the lamp is thrown out of circuit, the edge of the downwardly-projecting portion *n* of the sleeve may enter, thus permitting the sleeve to be turned sufficiently, so that the slots therein will register with those in the socket. When, however, the switch is in the other position and the lamp is thus thrown into circuit, (as it is when the parts are in the position shown in

Fig. 5,) the bar of the switch fills the space between the two prongs of this downwardly-extending part *n* and it cannot be turned, and thus the lamp is securely locked in position and cannot be removed so long as it is switched into the circuit.

The switch *K* is provided with a saddle-piece which extends into contact-springs *k'* and *k''*, which, when the switch is in one position, come in contact with the bases *C'* and *G'* to the contact-springs *C* and *G*, and thus form a short path for the electrical current, cutting out the lamp. A friction-spring, *K''*, is provided which prevents this switch from moving too easily, and thus the danger of its getting out of place is obviated.

The electro-magnet *J* is connected with the two sides *B* and *H* of the frame by small wires *j* and *j'*, and thus a high-resistance shunt circuit is formed through said magnet. A spring, *J'*, is connected to the frame-work of this magnet and extends up over it, as shown most plainly in Fig. 2.

An armature, *J''*, is pivoted in front of this magnet, near its pole-piece, and a tongue, *j''*, thereon extends up through an opening in the end of the spring *J'*; which, being provided with a notch, engages with said spring and holds it down to the position shown in Fig. 2. A small spring, *j''*, holds the armature into this engagement. Upon said spring *J'* is a saddle-like piece, *j''*, which is shown most plainly in Fig. 7. Extending out from the frame sides *B* and *H*, as also shown most plainly in Fig. 7, are contact-points *b* and *h*, with which the piece *j''* on the spring *J'* will come in contact when said spring is released.

Should the carbon in the lamp become broken or the circuit through the lamp in any other way interrupted, an increased amount of current would be sent over the shunt-wire *j*, the magnet *J* thus energized, and the armature *J''* thereby drawn toward said magnet, releasing the spring *J'*, and thereby, through the saddle-like piece *j''* and the contact-points *b* and *h*, establishing a cut-out circuit, as will be readily understood by those skilled in the art.

As will be noticed by an inspection of Fig. 2, there is a small round hole through the upper plate of the frame-work and a corresponding hole through the bar of the switch *K*. In the position these parts occupy when the lamp is in operation, as shown in said drawings, these holes are not in line; but when the switch *K* is moved to the other position, and the lamp thus cut out, these holes will register, and then, after the lamp is removed from its socket, a wire or pencil may be inserted through said holes, and the spring *J'* thus pushed down so as to re-engage with the armature *J''*. This arrangement insures that such re-engagement shall not be caused by careless or mischievous persons, except when the cut-out switch *K* is in such position that no harm can result.

The construction having been thus described,

it only remains to give a complete understanding of this invention to indicate the course of the currents. When the lamp is in circuit, the electric current comes in over the line-wire *A*, passes up the frame side *B*, through the contact-springs *C* and *D'*, the wire *D*, the carbon *E*, the wire *F*, the spring *F'*, the contact-springs *G*, the frame side *H*, and out over the outgoing line-wire *I*. When the cut-out switch is moved in the other direction and the lamp thus cut out, the course is over the line-wire *A*, the frame side *B*, the base *C'*, over the saddle-like piece on the switch *K*, to the base *G'*, and thence down the frame side *H* and out over the wire *I*. When the lamp is in operation and the carbon becomes broken, the course is first in over the incoming line-wire *A*, through the frameside *B*, over the shunt-circuit, through the coil *J*, and out over the outgoing line-wire *I*. This, however, lasts for only a short time, until, by reason of the electro-magnet becoming energized, the armature *J''* is drawn in, over the wire *A*, through the frameside *B*, the contact-point *b*, the saddle-like piece *j''*, the contact-point *h*, through the frame side *H*, and out over the wire *I*.

Having thus fully described our said invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in an incandescent electric lamp, of a socket having slots with notches at the lower ends, a sleeve inside said socket having corresponding slots, but no notches, the lamp-shank being formed to fit inside said sleeve, and provided with projections which extend out through said slots, and a reciprocating cut-out switch passing horizontally below said shank, socket, and sleeve, said sleeve being provided with a downwardly-projecting portion, which is bifurcated and extends over the bar of said switch, said switch-bar being provided with a notch which, when said switch is moved so as to cut out the lamp, is in such position that one of the prongs of the downwardly-extending portion on the sleeve may enter said notch, substantially as and for the purposes set forth.

2. The combination, in an incandescent electric lamp, of the shank thereof, having pins *m*, a socket, *L*, therefor, having slots with notches therein, a sleeve interposed between said shank and said socket, having corresponding slots, but no notches, and a downwardly-projecting bifurcated part which passes astride the bar of the cut-out switch, and a notch in said switch-bar arranged to register with the edge of the downwardly-projecting part of the sleeve when the lamp is cut out, and then only, substantially as shown, and for the purposes set forth.

3. The combination, with an incandescent electric lamp, of the shunt-magnet *J*, the spring *J'*, secured to the frame thereof and extending forward to above its pole-piece, an armature, *J''*, having a notched tongue which

extends through a hole in the forward end of said spring, said spring being provided with a saddle-piece having contact-points, and contact-points upon the frame-work, with which the contact-points on the spring will come in contact when said spring is released after said magnet is energized and its armature thus drawn out of engagement with said spring, substantially as set forth.

10 4. The combination, with an incandescent electric lamp, of the contact-points *b* and *h*, attached to the frame parts forming portions of the electrical path, a shunt-magnet connected to said frame parts by fine wires, an armature  
15 pivoted in front of the pole-piece of said magnet, and a spring carrying a saddle-piece which engages with and is normally held down by said armature, but when released (as said magnet is energized and the armature thereby  
20 drawn out of engagement with said spring) will come in contact with said contact-points, and thereby cut out the lamp, substantially as set forth.

5. The combination, in an incandescent electric lamp, of a shunt-magnet, an armature thereto, which forms also a catch for the spring, said spring having a saddle-piece which, when said spring is released, comes in contact with other portions, and thereby establishes a cut-  
30 out circuit, a positive cut-out switch, an opening through the plate forming part of the frame-work above said spring, and a corre-

sponding opening through said cut-out switch, which, when the lamp is cut out thereby, registers with the opening in said plate, whereby  
35 an instrument may be inserted and the spring forced downwardly so as to re-engage with the armature of the magnet, substantially as shown and described.

6. The combination, in an incandescent electric lamp, of the ordinary contact-springs and frame portions forming a part of the electrical path, a positive cut-out switch arranged to move transversely across the lamp structure, a shunt-circuit composed of projections on the  
45 frame-work, and a spring having a saddle-piece which is normally held in position by the armature of the shunt-magnet, said spring being inclosed by the frame-work, said frame-work being provided with an opening above  
50 said spring, which is covered by the switch except when in cut-out position, whereby it can only be re-engaged with said armature when the lamp is cut out by the positive cut-out switch, substantially as set forth.

In witness whereof we have hereunto set our hands and seals, at Indianapolis, Indiana, this  
55 4th day of April, A. D. 1888.

JOHN S. ADAMS. [L. S.]  
ALBERT W. MORRELL. [L. S.]

Witnesses:

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