(No Model.)

C. HEISLER.

INCANDESCENT ELECTRIC LAMP HOLDER AND CUT-OUT.

No. 380,202. Patented Mar. 27, 1888.

Fig. 1.

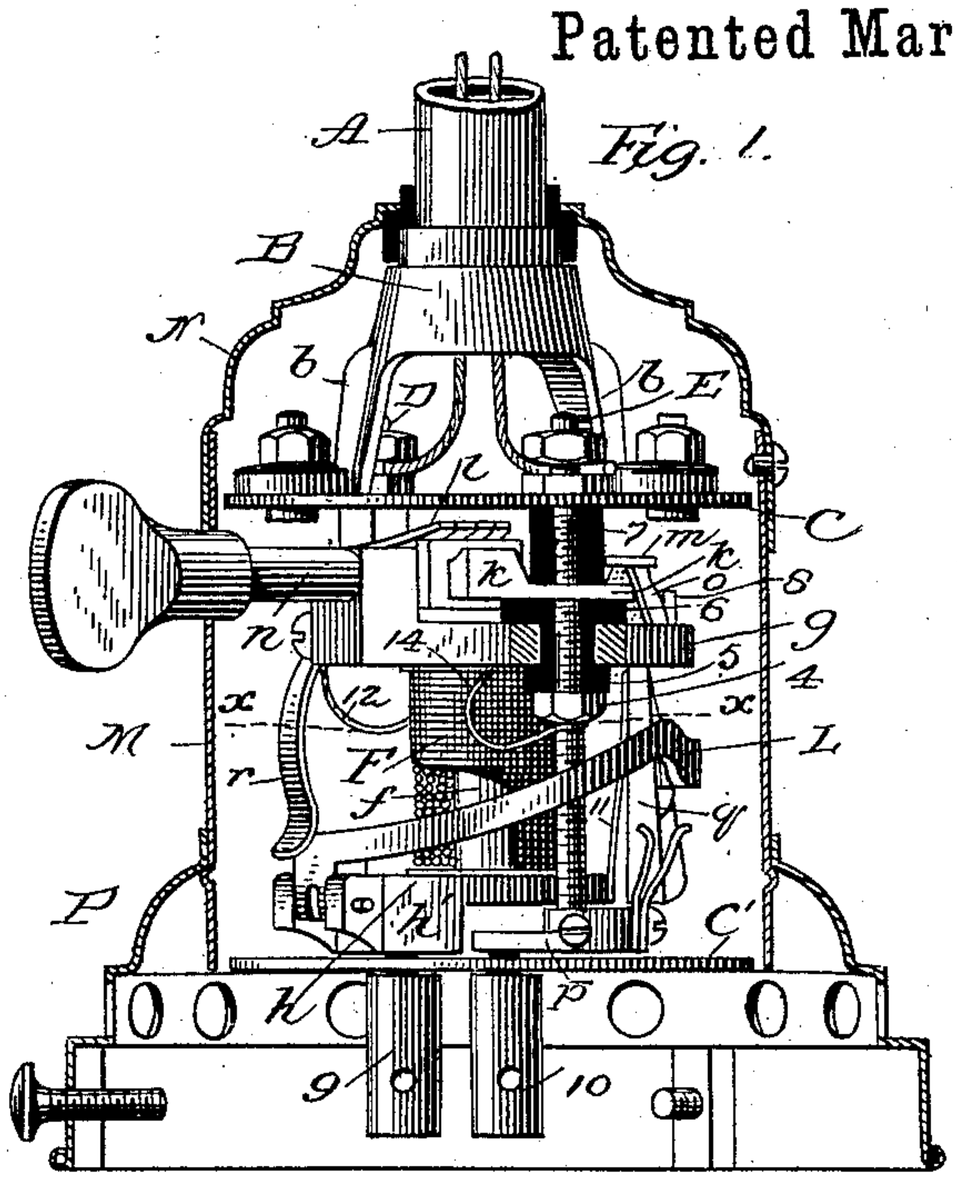


Fig. 2.

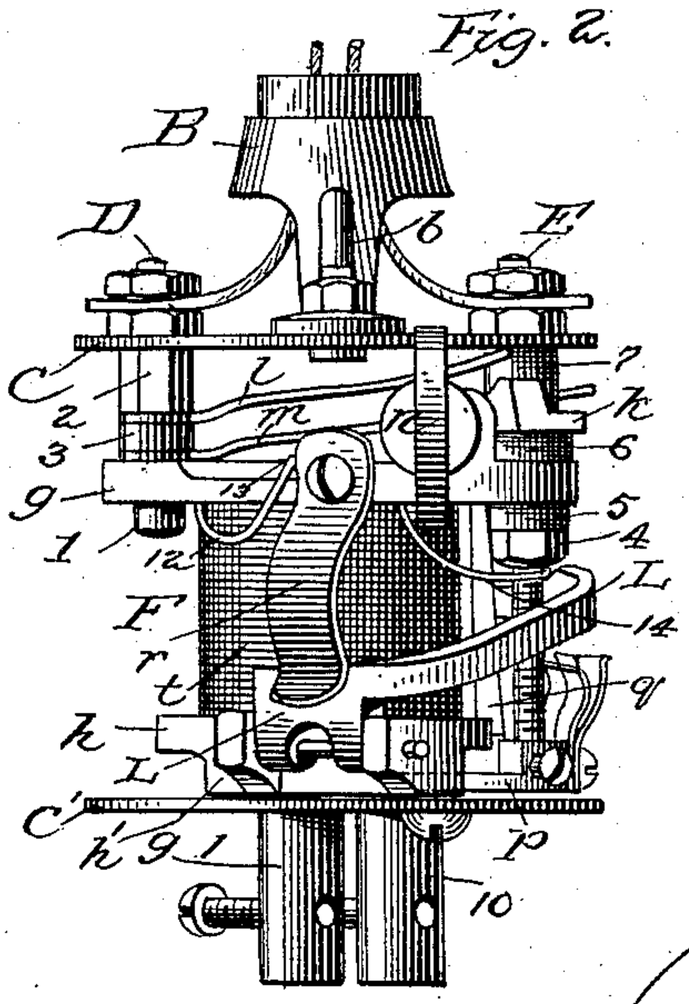


Fig. 3.

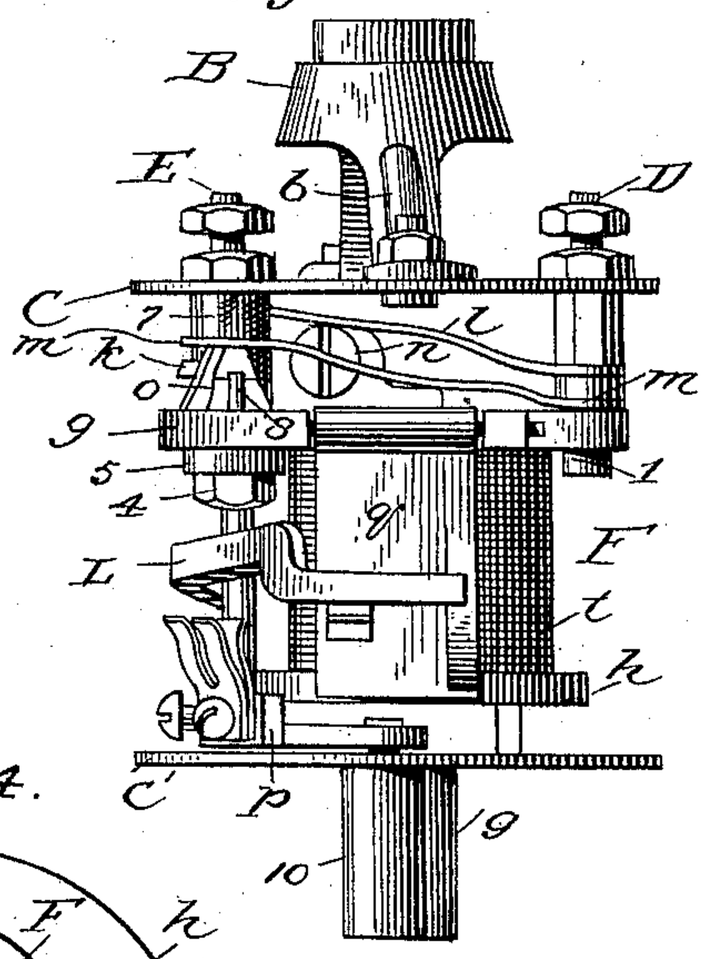
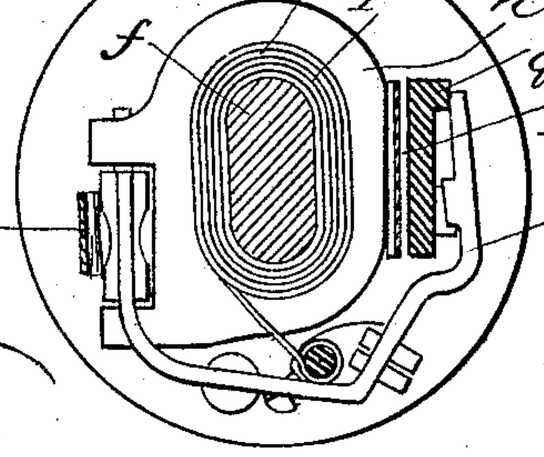


Fig. 4.



Attest:
Walter D. Adams
Frank L. Middleton

Inventor
Chas. Heisler.
by Ellis Spear
Atty.

UNITED STATES PATENT OFFICE.

CHARLES HEISLER, OF ST. LOUIS, MISSOURI.

INCANDESCENT-ELECTRIC-LAMP HOLDER AND CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 380,202, dated March 27, 1888.

Application filed January 18, 1887. Serial No. 224,708. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HEISLER, of St. Louis, in the State of Missouri, have invented a new and useful Improvement in Incandescent-Electric-Lamp Holders and Cut-Outs; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to incandescent electric lamps in series, and more particularly to mechanism for shunting the current when, from any cause, the lamp becomes inoperative.

It also includes an improved casing for the shunting mechanism and improved insulating parts. The objects sought to be accomplished are, first, certainty in shunting the current when the lamp becomes inoperative; second, compactness and simplicity in the parts; third, economy of construction.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of my improved shunting mechanism, the case for inclosing the same being shown in section. Fig. 2 is a side elevation looking from the left of Fig. 1. Fig. 3 is also a side elevation looking from the right of Fig. 1. Fig. 4 represents a section on line *x x* of Fig. 1.

In the drawings, A represents the tubular bracket or support for the lamp, through which the wires are led to the lamp. To this tube is screwed a casting, B, consisting of a tubular shank having legs *b b*, which are bolted to a thin disk, C, of vulcanized fiber or other insulating material. This disk forms a support for the lamp and intermediate parts, and serves also to insulate them, and the wires may be readily led to the binding-posts D E, which are supported on the disk C in line at right angles to that of legs *b b*. This allows the line-wires from the tubular shank to be brought laterally to the binding-posts. These posts are connected to and support the upper extension or pole-piece of the core of an electro-magnet, F. This core *f* is cast with extensions or pole-pieces *g h*, which are in the form of flanges at right angles to the axis of the core. The binding-posts are extended and pass through the upper flange, *g*, the post D being electrically connected to the flange by direct contact and mechanically by a nut, 1, on its lower end, and it is held at proper distance therefrom by sleeves 2 and 3. The other post, E, passes through the flange *g*, but is insulated therefrom. It is made to support the flange by means of a nut, 4, between which and the under surface of the flange is an insulating-collar, 5, on the post.

On the upper surface of the flange *g* is a piece, *k*, placed on the post E and in electrical connection therewith, but insulated from the flange *g* by a non-conducting plate, 6, and clamped between this plate and the upper disk by a non-conducting sleeve, 7. The piece forms a bearing for the conducting and short-circuiting springs *l* and *m*, which are held on the post D, being clamped by the sleeves, and in electrical connection with said post, so that when either or both of said springs *l* and *m* bear on the piece *k* the lamp is short-circuited. The spring *l* is raised by a cam on the shaft of the thumb-piece *n* and forms the manual switch. The spring *m* rests normally on an easily-fusible block, *o*, which rests upon and in contact with the upper flange of the core near its edge. It is held between a pin, 8, and the end of the piece *k*, from which it is separated electrically, preferably by a bit of paper.

The lower flange, *h*, of the core has a raised portion, *h'*, in its lower surface, to which the socket 9 of the lamp-terminal is attached, the lower disk of vulcanized fiber, C', similar to the upper, being held between this socket and the raised portion of the flange. This socket forms an electrical connection with the flange, and the circuit on this side of the apparatus is from the line-wire through the binding-post D, the upper flange, the core, the lower flange, and the socket 9, to the lamp. On the other side the post E extends down into a piece, *p*, to which it is electrically connected, being held thereon securely by a set-screw. The electro-magnetic core, with its extension, thus forms the sole connection between one of the lamp-terminals and the supporting-bracket. The piece *p* abuts against the lower disk, and, extending inwardly toward its center, is fixed to the socket 10 for the lamp-terminal made to the socket *g*. Thus when the thermal and manual switches are open the circuit is through the post E, the piece *p*, the socket 10, the lamp, and the socket 9, to the line, as above described.

The principal reliance for short-circuiting the lamp in case of accident thereto is the electro-magnetic switch, the thermal, as above described, being intended to operate in case of failure of the electro-magnetic switch. The armature *q*, by which the switch is operated, is pivoted on the edge of the upper flange, *g*, or pole of the electro-magnet, and hangs with its lower end in front of the edge of the lower flange or pole, from which it is normally held by a spring, 11. Its outer face has near one edge a lug adapted to catch and hold up the switch-lever, and near the other edge a low curved flange, against which the end of said lever bears to limit properly the outward movement of the armature. The switch-lever L is of special shape, fitted to its relation to the other parts. It is approximately a half-ring. One end is pivoted on a horizontal pivot in lugs on the edge of the lower flange, *h*. The lever is above its pivot, and is bent around the core and post E, and the free end extends in front of the lower end of the armature and opposite the pivoted end. A spring, *r*, fixed to the flange *g*, bears on the outer face of the pivoted end of the lever above its pivot, tending to force down the free end, and forming, also, electrical connections therewith. The free end of the lever is made to rest against the curved flange on the outer face of the armature, and when raised to rest upon the lug on said outer face, the armature being pressed out to catch under the lever, as above explained. This extreme end of the lever bears against the flange on the armature, and when the parts are put together this end may be bent to adjust the armature properly to the pole of the magnet.

Within range of the lever, as it drops when released by the armature, are spring contact-fingers on the piece *p*. When the lever is down, these complete a shunt-circuit from the post E through the piece *p* to the lever L, and thence to the upper flange and post D, thus short-circuiting the lamp. The lever might drop directly upon the piece *p*, or some equivalent connection between the post and sleeve 10; but the yielding fingers form better connection. The switch acts as ordinary electro-magnetic switches when the current is forced through the coil *t*, placed around the core.

The apparatus described is designed for lamps worked by an alternating current. Such a current when forced through the coils of an electro-magnet heats first and principally the core, and I have therefore interposed the fusible block between the core extension or flange *g* and the thermal-switch-spring, so that on failure of the electrical switch to act the melting of the block, due to rise of temperature of the flange caused by the excess of current in the coil, may allow the thermal-switch spring to drop and close the short circuit. The coil-connections in the circuit are shown by wire 12, connected at 13 to the upper flange, and wire 14, forming the other end of the coil, joined to the post E. The coil thus forms a circuit around the lamp, and when the lamp fails to act the current is forced through the coil, the construction and operation in this respect being well known. The core and its flanges or extensions forming the poles I prefer to cast all in one piece for economy of construction; but whether thus cast in one piece or of several connected pieces, they form the main frame-work for all the structure as well as the electrical connection in one part of the line. Further on the upper core extension or flange, *g*, is the bearing for the shaft by which the manual switch is operated, and on this also the upper disk is supported, which is connected to the legs of the bracket-connection.

The construction above described is such that the completed and united parts form a compact mechanism which may be inclosed in a cylindrical case. This I form in two parts. The main case M is of cylindrical sheet metal, and incloses the main body of the shunting mechanism. The upper part is in the form of a cap, N, spun in the shape shown, and having a hole in the upper part fitting the tubular bracket. The lower part is cylindrical and fits over the upper part of the body M. In putting the parts up this is first slipped on the tubular bracket. Then the casting B is screwed on with the shunt mechanism attached, and the body M may be passed up over this mechanism and connected to the upper part, N.

The lower part of the casing I prefer to form of one piece with the cylindrical part by spinning it in the form shown at P; but the flaring part P may be formed separately and soldered to the part M. In the lower edge of this are ventilating-holes and screws for the lamp-globe.

The easily-fusible block, as above described, is electrically separated from the piece *k*, but is near to it, the separation being formed, preferably, of paper interposed. In case the spring switch-connection fail to operate through failure of the flange to melt the core, a spark will pass from the piece *k* to the block and melt it, thus causing the switch to operate.

I claim as my invention—

1. In combination with an electric lamp and an electro-magnetic shunting mechanism, the core of which is directly connected to one of the lamp-terminals and forms a part of the circuit between that terminal and one of the line-wires, and having its coil in a circuit around the lamp, a switch operated by the electro-magnet and arranged to short-circuit the lamp, all substantially as described.

2. In combination with an electric lamp, a magnet-core the coils of which are in shunt with the lamp-circuit, and having flanges on its ends acting as pole-pieces, the flange at one end being connected permanently to one of the lamp-terminals, the flange at the other end connected to binding-posts, one insulated and the other uninsulated thereon, connections between the insulated post and the other lamp-terminal, whereby the lamp-circuit is formed through the core, and a magnetic shunt operated by the armature of the electro-magnet

when the lamp fails to work, all substantially as described.

3. An electro-magnet having a core formed with flanged or extended pole-pieces attached on one end to one of the terminals of a lamp, binding-posts upon the flange of the other end, with bracket-connections and with binding-posts, one insulated from the flange and connected to the other lamp-terminal, and the other uninsulated on the same flange, a coil about the core in shunt with the lamp-circuit, an armature hinged upon the flange of one end of the core and extending in front of the edge of the flange on the other end, a conducting-lever arranged when down to short-circuit the lamp and normally held up by a shoulder on the armature, but arranged to be released when the armature is attracted to the core, all substantially as described.

4. In combination with an electric lamp and an electro-magnet, a switch, one end of the core of the electro-magnet being rigidly connected to the bracket, as A, and the other end rigidly connected to the lamp, the core with its extensions forming the sole connection between one of the lamp-terminals and bracket, all substantially as described.

5. In combination with the upper and lower flanges of the core of the magneto-electric switch, a socket for the lamp-terminal connected directly to the lower flange and electrically connected to a binding-post on the upper flange, an extension of a second socket for the lamp-terminal electrically connected to the other binding-post, also supported on the upper flange, an insulating-disk at each end of the electro-magnet, and supported thereon, substantially as described.

6. In combination with an electric lamp, an electro-magnet the core of which forms a part of the permanent circuit of the lamp, the armature of which controls a shunting-lever for short-circuiting the lamp, a flange on one end of the electro-magnetic core, a manual switch and bearing for the switch-key on said flange, all substantially as described.

7. In combination with an incandescent lamp, an electro-magnet having its coil in shunt with the lamp-circuit, a flange on one end of the core of the magnet supporting a manual and a thermal switch, an electro-magnetic switch controlled by the armature of the electro-magnet, and a fusible block interposed between the surface of the flange and the thermal switch, whereby under the influence of the alternating currents the block may be melted and the switch operated, all substantially as described.

8. In combination with the lamp, the electro-magnet and its armature hinged on one flange of the core and extending before the other, a conducting-lever pivoted one side of the flange and extending around to a point opposite the free end of the armature and contact-piece in circuit, all substantially as described.

9. In combination with the lamp and the electro-magnetic switch therefor, the core of the magnet being in the lamp-circuit, a flange forming one pole of the electro-magnet, a binding-post fixed and insulated on the flange, and an extension of said binding-post to complete the lamp-circuit, an insulating-disk supported on the posts, and a shank having legs attached to the disk, whereby the disk is connected to the bracket, all substantially as described.

10. In combination with the lamp, the electro-magnetic switch therefor, the core of the magnet being in the lamp-circuit by means of a binding-post on a flange on one end of the core, and a raised portion on a flange at the other end of the core, to which the lamp-socket is fixed, and a binding-post and connections to complete the lamp-circuit, all substantially as described.

11. In combination with the pole-piece of the core of the electro-magnetic switch of an electric lamp, a fusible block resting on the pole-piece and normally sustaining a spring-switch out of contact with a piece, *k*, which is in connection with the lamp-circuit and underneath the spring-switch, the fusible block being located near, but separated electrically from, the piece *k*, all as and for the purpose set forth.

12. A spring for the manual switch and a spring for the thermal switch, both combined with a single screw and with sleeves thereon, substantially as described.

13. In combination, the electro-magnet with its core and flanges, the automatic short-circuiting lever pivoted upon the lower flange of the core and bent around the core of the described cut-out, substantially as described.

14. In combination, the electro-magnet with its core and flanges, the automatic short-circuiting lever arranged around the core, as described, and having its pivot upon the lower flange, and the spring *r*, fixed to the upper flange and bearing upon the lever above its pivot, substantially as described.

15. The combination, with the upper disk, of the cut-out mechanism, the bridge having a hollow boss, said bridge holding the disk and the cut-out mechanism to the pipe-fastening, and the wires passing through the hollow boss of the bridge and carried outwardly through the opening in the bridge to the binding-posts, substantially as described.

16. In combination with the lower flange of the iron core of the cut-out, a lamp-socket attached directly to said flange, as described.

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

CHAS. HEISLER.

Witnesses:
M. L. COUNTRYMAN,
PAUL F. COSTE.