(No Model.)

H. LEMP & M. J. WIGHTMAN.

THERMAL CUT-OUT FOR ELECTRIC LAMPS.

No. 493,629. Patented Mar. 21, 1893.

Fig. 1

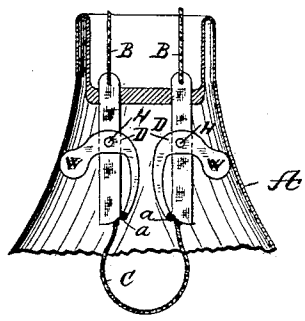


Fig. 2

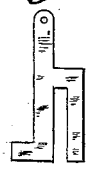


Fig. 3

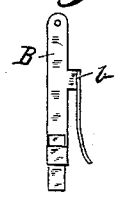


Fig. 4

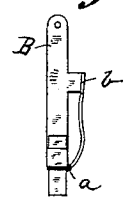
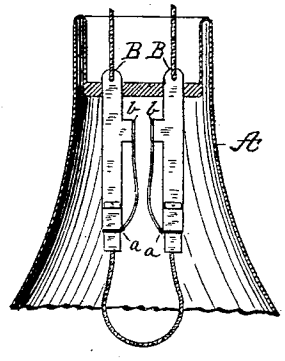


Fig. 5.



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THERMAL CUT-OUT FOR ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 493,629, dated March 21, 1893.

Application filed August 27, 1886. Serial No. 211,991. (No model.)

To all whom it may concern:

Be it known that we, HERMANN LEMP and MERLE J. WIGHTMAN, citizens of the United States, and residents of Hartford, in the county of Hartford and State of Connecticut, have invented a certain new and useful Thermostatic Cut-Out for Electric Lamps, of which the following is a specification.

Our invention relates to automatic cut-out devices designed for use with incandescent electric lamps and adapted to automatically shunt the lamp out of circuit in case the filament or incandescent body becomes ruptured.

Our invention relates to that class of cut-outs in which the heat of the arc which follows the rupture of the filament is employed for the purpose of calling the switch into operation.

The invention consists in the special features of construction and combinations of devices as hereinafter more particularly described and specified in the claims.

One of the features of our invention consists in the mounting of the shunting contact which is operated by the heat of the arc, upon the leading in conductor itself within the lamp and giving the shunting contact a bias against the influence of which it is normally detained by a fusible or destructible connection at another point of the said conductor.

Our invention consists also in making the switch of a piece of metal integral with the leading in wire or conductor and at any point thereof either within or without the lamp but in such relation thereto that it may be brought into operation by the action of the arc which follows the rupture of the incandescent conductor and either maintains itself within the globe or follows down the leading in wires.

Another feature of the invention relates to the shunting switch composed of a pair of biased contacts mounted on the leading in wires and having a bias toward one another.

In the accompanying drawings:—Figure 1, represents a form of lamp in which the bias of the shunting switch is due to gravity. Figs. 2, 3, 4 and 5, illustrate, a construction of lamp embodying our invention in which the bias is obtained by a spring.

We have herein shown our invention as applied to the ordinary form of lamp having the leading in wires or conductors extending into the lamp parallel with one another but the many features of improvement hereinafter described would be applicable to other constructions or forms.

Referring to Fig. 1, A, is the lamp; B, B, the leading in conductors or poles arranged on opposite sides of the lamp and in electrical connection with the main circuit; C, is the incandescent filament, or other incandescent body; D, D, are the two switch levers pivoted upon the leading in conductors or poles of the lamps at the points H, H, and having electrical connection therewith at those points. These switches are preferably mounted upon the conductors within the lamp where they will be subject to the immediate action of the arc forming on rupture of the incandescent conductor, but the special construction of switch and mounting of the same would also permit the locating of the switch upon the conductor outside the globe. The inner and lower ends of the levers D, D, are normally held apart and are fastened to the conductors B, B, at the points *a*, *a*, by means of a low temperature solder or other destructible or fusible material which serves to hold the contacts apart under normal conditions but which is capable of being fused, softened or destroyed, by the heat of the arc formed between the broken ends of the conductor so as to release the contact. The outer ends of the levers are formed with weighted extensions W, W, which serve to bring the inner ends of the levers together,—when the material which holds either switch in normal position is so effected by the arc as to release the switch. When this latter condition occurs the levers in connection with the leading in conductors of the lamp form a short path for the electric circuit thereby short circuiting the arc and cutting out the lamp from the system.

It is evident that the lamp just described must be held in substantially a vertical position in order that the weighted extensions W W, may perform their described function.

In Figs. 2, 3, 4, 5, we have illustrated another form of lamp which may be used indiscriminately in any position. In this form of lamp the thermostatic shunting contacts are composed of some flexible or elastic medium fastened at one end *b*, *b*, to the leading in conductors and having electrical connection therewith at that point in such a manner that their free ends when either or both are released will meet within the lamp so as to form a conducting path for the current. The free ends of these spring contacts are held normally apart by being bent back and soldered or otherwise fastened to their respective pole pieces or conductors by means of a low temperature solder or other suitable material at the points *a*, *a*. The operation of these devices is substantially the same as in the case of the lamp just described. A voltaic arc will be formed between the broken ends of the filament, and the heat of the arc will operate upon the soldered or other connection of the spring contacts and permit the free ends to meet within the lamp thus forming a short path for the current and thereby short circuiting the arc and cutting out the lamp.

In the drawings we have shown the thermostatic contacts as located in immediate proximity to the filament so that the operation of short circuiting the lamp will take place as soon as possible after the rupture of the filament. It is evident, however, that the contacts may be located anywhere along the line of the leading in conductors provided that the construction of the lamp is such that the arc formed on rupture of the filament will follow down and consume the leading in conductors until it reaches the shunting contacts when the heat of the arc will release the same as before.

In Figs. 2, 3 and 4, we have shown how the spring contacts already described may be made integral with the leading in conductors or poles.

Fig. 2, shows a blank struck up out of suitable material.

Fig. 3, shows the spring contact bent into its proper relation with the conductor in any of the well known ways familiar to those skilled in the art.

Fig. 4, shows a spring contact suitably fastened to its conductor by the soldered connection.

In this specification we have described a lamp in which two moving thermostatic shunting contacts are employed, but we do not limit ourselves to that construction as it would be clearly within the spirit of our invention to employ one moving part instead of two similar parts that part making contact with a corresponding stationary part, or with the conductor itself, or with an extension thereof.

We are aware of the patents to Edison Nos. 214,637 and 227,228 and German patent No. 9,165, and the patent to Thomas No. 319,347, and make no claim to anything therein shown and described.

What we claim as our invention is—

1. The combination with an incandescent lamp, of a thermostatic shunting contact located on the leading in conductors and within the lamp, and adapted to be brought into contact by the heat of the arc formed upon rupture of the filament, as and for the purpose described.

2. The combination with an incandescent lamp, of a thermostatic shunting contact having a permanent metallic connection at one point with the leading in conductor, and a fusible or destructible connection at another point and in proximity to the filament, as and for the purpose described.

3. The combination with an incandescent lamp, of elastic contacts bent normally out of contact and adapted to spring together upon being released by the increase of the temperature due to the rupture of the filament, as and for the purpose described.

4. In an incandescent electric lamp, an automatic shunting switch having its movable member formed integral with the leading in wire or conductor to which the incandescing body is attached.

5. In an incandescent lamp, an automatic shunting switch attached to a lamp conductor within the lamp and held in normal position by a destructible or fusible fastening applied to the said conductor.

6. In an incandescent electric lamp, a shunting switch composed of a pair of biased contacts mounted on the leading in wires and having a bias toward one another, in combination with a destructible fastening normally holding said contacts apart.

7. In an incandescent electric lamp, a shunting switch consisting of a biased arm or contact secured to a leading in wire or conductor within the lamp, and a fusible or destructible fastening for said switch within the lamp.

8. In an incandescent electric lamp, a spring switch contact integral with the leading in wire or conductor.

9. In an incandescent electric lamp, a spring switch integral with the leading in conductor, and a fusible or destructible fastening normally holding the free end of said spring, as and for the purpose described.

10. In an incandescent electric lamp, a spring switch integral with the lamp conductor within the globe and fastened at its free end to said conductor by a fusible or destructible material, as and for the purpose described.

Signed at Hartford, in the county of Hartford and State of Connecticut, this 13th day of August, A. D. 1886.

HERMANN LEMP.
MERLE J. WIGHTMAN.

Witnesses:
WM. E. SHEPARD,
CHAS. E. DUSTIN.