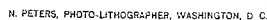


Patented Aug. 26, 1879.



UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY.

IMPROVEMENT IN ELECTRIC LIGHTING APPARATUS.

Specification forming part of Letters Patent No. **218,866**, dated August 26, 1879; application filed December 9, 1878.

To all whom it may concern:

Be it known that I, THOMAS ALVA EDISON, of Menlo Park, in State of New Jersey, have invented an Improvement in Electric Lighting Apparatus, of which the following is a specification.

In an application before filed by me, the light-giving body is combined with the circuit-connections and a thermal regulator that prevents injury to the apparatus by short-circuiting the current or placing a resistance therein. I do not therefore herein claim any such device.

My present invention relates to the combination, with the light-giving body, of a range of levers and contact-surfaces arranged in such a manner that the current is short-circuited or shunted to a greater or less extent, according to the heat of the incandescent light-giving body.

In the drawings, Figure 1 is an elevation of the bracket and a section of the light-giving apparatus. Fig. 2 is a sectional plan at the line *x x*. Figs. 3 and 4 are diagrams of the circuit-connections; and Fig. 5 is a partial elevation endwise of the shunting-levers.

The bracket *a* is sustained by a socket and pin at *b*, so that it may be swung like a gas-fixture.

c is one of the electric conductors. The same is insulated and passes into an opening in the bracket, and thence to the electric light, and the return circuit is through the pipe *a* to the wire *d*, or to the gas-pipe, if the bracket is upon a gas-pipe.

The conductor *c* passes to the insulated plate *c'* within the case *f*, and, for convenience, this case *f* has a swinging door, *f'*, in one side to give access to the interior parts. Above the case *f* is a glass cylinder, *h*, or other suitable protection for the electric light, and *i* is a strip of platina-foil or other known or desired light-giving material that can be rendered incandescent and produce the necessary light without melting. The conductor *c'* passes to one end of this light, and the other end of *i* is connected by the spring *k* with the metal part of the bracket, and thence to *d*.

The spring *k* serves to keep a slight tension on the foil *i*, and the yoke or frame *l* intervenes between the spring *k* and the foil.

There are levers *n*, or springs, that are connected at 2, and their free ends rest in and

upon the yoke or frame *l*, and their ends should be tipped with platina.

The bar *o* is preferably of platina, and it is adjustable by means of the screw *m*, that raises or lowers the same, so as to bring it nearer to or farther from the ends of the levers or springs *n*. This adjustment is made so that the ends of the springs or levers *n* will not be in contact with the bar *o* while the light is in its normal condition; but when the heat of the foil *i* becomes excessive the expansion allows the ends of the springs or levers *n* to come into contact with the bar *o* and set up a shunt or short circuit from *c o*, through *n*, to *d*, and, according to the amount of expansion in *i*, so one, two, or more of the bars or springs *n* will be in contact with *o*, because said bar *o* is farther from the levers *n* at one end than at the other. By this means injury to the light-giving body is prevented, and a path established for the electric current becomes less in resistance as the points of contact between *n* and *o* increase in number.

The lower end of the yoke *l* may come into contact with the spring or stud *t* at the extreme expansive movement, as seen in Fig. 4, to still further lessen the resistance between *c* and *d* and divert the current from the foil *i*.

The ends of the levers *n* may be in a bath of mercury, as seen in Fig. 4, to insure electric contact. If the foil *i* is accidentally broken or injured the circuit through *n* is instantly closed, so that other lights in the same circuit are not extinguished. This device is automatic, so as to avoid the extinguishment of other lights.

I claim as my invention—

1. The combination, with the light-giving body, of two or more circuit levers or springs, *n*, a yoke, *l*, a contact-bar, *o*, and the circuit-connections, substantially as set forth, for lessening the resistance of the shunt as the temperature of the light-giving body increases, as specified.

2. The circuit-connection *t*, in combination with the levers or springs *n*, yoke *l*, light-giving body *i*, and circuit-connections, substantially as set forth.

Signed by me this 3d day of December, A.D. 1878.

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