

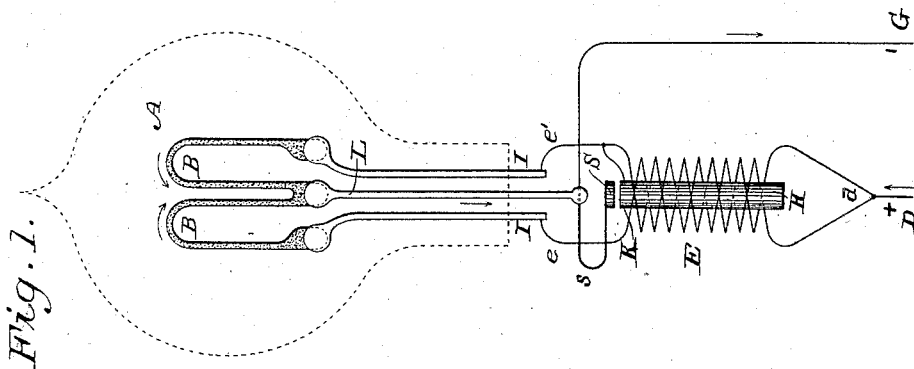
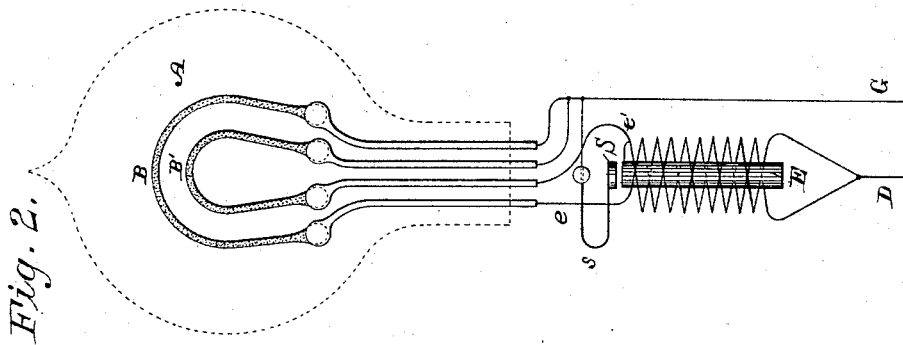
(No Model.)

W. M. THOMAS.

AUTOMATIC CUT-OUT FOR INCANDESCENT LAMPS.

No. 316,501.

Patented Apr. 28, 1885.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM M. THOMAS, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF TO THE GRAND RAPIDS ELECTRIC LIGHT AND POWER COMPANY, OF SAME PLACE.

AUTOMATIC CUT-OUT FOR INCANDESCENT LAMPS.

SPECIFICATION forming part of Letters Patent No. 316,501, dated April 28, 1885.

Application filed November 24, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. THOMAS, of Grand Rapids, Kent county, Michigan, have invented certain new and useful Improvements in Automatic Cut-Out Devices for Incandescent Electric Lamps, of which the following is a specification.

My invention is to be applied to incandescent lamps connected alone in series or in combination with arc lights. No claim is, however, made in this case to any such arrangement of lamps, but my present invention relates to improved cut-out devices, which I will now describe.

In the accompanying drawings, Figure 1 is a diagram view illustrating the lamp equipped according to my invention; and Fig. 2 is a similar view showing a slight modification of lamp working on exactly the same principle.

Let D G represent the wires of the main line running into opposite sides of the lamp. Let us assume that the current enters the lamp through the wire D and leaves it through the wire G. The wire D is divided at the point *d*, and each branch is wound upon a core, E, but in opposite directions, as is well understood, so that should a current in the direction of the arrow traverse these coils no magnetic effect would be produced in the core. Upon leaving the core E these wires (marked *e e'*) connect with the carbon-supports I I, which enter the hermetically-sealed globe A, and support the carbon B B in any usual well-known way. The carbon B is, however, shown as made M-shaped, and the central lower bend is similarly connected with a conductor, L, which passes through the base of the globe and is connected with the wire G, as clearly shown. The current entering by the wire D will therefore divide around the core E, and then through the wires *e e'* will pass through both sections of the carbon or incandescent substance, and out of the lamp by the conductor L, to the line-wire G. The lamp will, therefore, be incandescent as long as these conditions exist. If, however, either of the sections of the carbon B B gives out or becomes fractured, the

current will cease traversing one of the wires *e* or *e'*, so that their neutralizing effect upon the core E ceases and the core becomes magnetized, and by this means the lamp is cut out of circuit, as I will now describe.

Upon or electrically connected with the lower end of the conductor L is a spring, *s*, which carries an armature, S, which is attracted by the core E when it becomes magnetized. One of the wires *e* or *e'* is connected with the core E, *e'* being shown so connected in the drawings. It will now be perceived that should either of the sections of the carbon give out, as above suggested, the armature S will be attracted and a short circuit will be immediately established and cut the lamp out of circuit. This short circuit is through either of the wires *e* or *e'*, core E, and armature S, to the main-line wire G. Substantially such a cut-out arrangement of magnet and armature considered by itself is shown in prior patents granted to me; but so far as I am aware an arrangement involving the connection of carbons described is novel.

In Fig. 2, instead of employing an M-shaped carbon, I use two horseshoe-shaped filaments, B B', preferably arranged one within the other. The operation is precisely the same. When the lamp is burning, the current through the wire *e* traverses the carbon B, and thence to line G, and the current in the wire *e'* traverses the carbon B', and thence to line G. In case of rupture of either carbon the armature S is attracted and the short circuit is established, as before.

The connections are clearly shown in the drawings, and further description is deemed unnecessary.

I claim as my invention—

1. The combination of the differentially-wound magnet, its cut-out armature, circuit-connections, and the carbon or incandescent material or filament arranged in sections, each of which is included in a branch of the circuit.

2. The combination, in an electric lamp, of the incandescent material, independent sec-

tions or portions of which are each included in a branch of the circuit, circuit-connections, and an automatic cut-out for short-circuiting the lamp whenever either portion of the incandescent material is fractured.

3. The combination, in an electric lamp, of the M-shaped carbon, the three electrical connections therewith, and the automatic cut-out.

In testimony whereof I have hereunto subscribed my name.

W. M. THOMAS.

Witnesses:

JOS. H. WALKER,
WM. H. POWERS.