

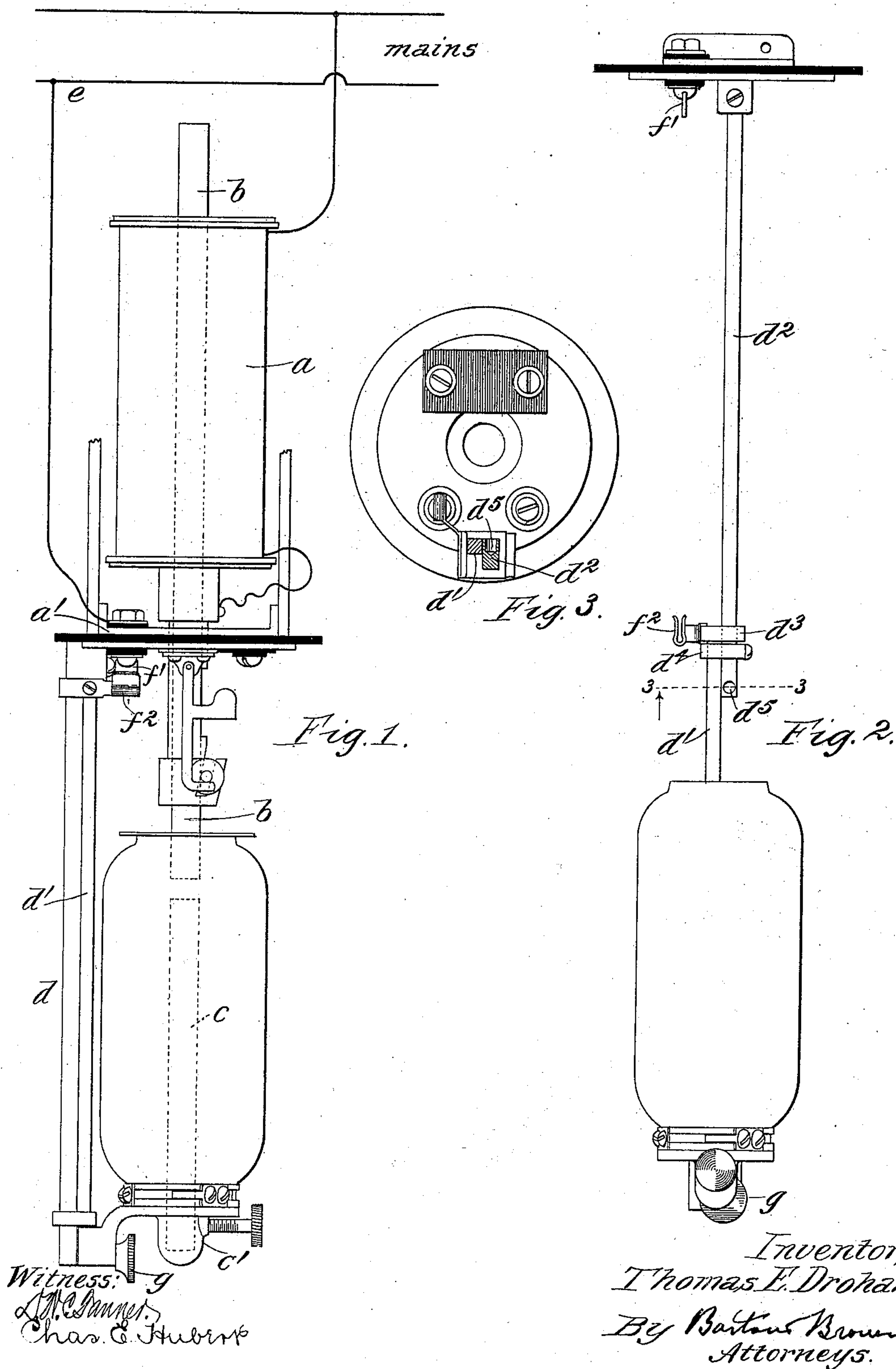
**No. 619,014.**

**Patented Feb. 7, 1899.**

**T. E. DROHAN.**  
**ELECTRIC ARC LAMP.**

(Application filed Dec. 1, 1898.)

(No Model.)



# UNITED STATES PATENT OFFICE.

THOMAS E. DROHAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE SIEMENS & HALSKE ELECTRIC COMPANY OF AMERICA, OF SAME PLACE.

## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 619,014, dated February 7, 1899.

Application filed December 1, 1898. Serial No. 697,974. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS E. DROHAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electric-Arc Lamps, (Case No. 189,) of which the following is a full, clear, concise, and exact description.

My invention relates to electric-arc lamps; and its object is to provide improved means for cutting a lamp out of circuit during the time in which the trimmer is engaged in supplying the same with fresh carbons.

In accordance with my invention the lower-carbon holder is mounted in a manner to permit of its being let down or otherwise moved away from its normal position to afford easy access to the working parts of the lamp, and switching mechanism is associated with the said lower-carbon support, whereby the circuit of the lamp is automatically broken when the said lower-carbon support is moved away from its normal position. For instance, the side rod of the lamp which supports the lower-carbon holder may be constructed in two parts or members, one of which may be fastened rigidly to the lamp-frame, but carefully insulated from any current-carrying part thereof, and the other part of the side rod may be arranged to slide up and down upon the stationary part or member. The movable part of the side rod is the one which immediately supports the lower-carbon holder, and at the upper end of the said movable part one member of a switch may be mounted, which is adapted when the lower-carbon holder is in its normal position to engage with a complementary switch member stationarily mounted upon the lamp-frame. The stationary member of the switch may be connected with a current-carrying part of the lamp, so that when the lower-carbon holder is in its normal position current will be supplied through the stationary member of the switch, and thence, by way of the movable member thereof associated with the movable member of the side rod, to the lower-carbon holder and carbon. It will be understood that when the lower-carbon holder is let down to enable the

trimmer to insert new carbons in the lamp this very act will cause the two members of the switch aforesaid to be separated, thus breaking the circuit and disconnecting the lower-carbon holder from any current-carrying portion of the lamp.

By making use of my invention a number of arc-lamps may be provided upon one circuit, and any of the lamps may be trimmed without the necessity of cutting out all the remaining lamps of that circuit at the main switch. Further, the lamp-trimmer is protected from accidental burns while trimming a lamp, even though the continuity of the lamp-circuit is not broken save by the act of letting down the lower carbon, as above explained.

My invention will be described more particularly by reference to the accompanying drawings, in which—

Figure 1 is an elevation of an arc-lamp embodying my invention, some of the parts being broken away and others indicated diagrammatically for clearness. Fig. 2 is a detail elevation of the side rod and lower-carbon holder, the latter being illustrated as let down in the position it would occupy during the trimming of the lamp. Fig. 3 is a sectional view on line 3 3 of Fig. 2.

Similar letters of reference are used to designate the same parts wherever they are shown.

The regulating mechanism of the arc-lamp is of a well-known type, and consists, essentially, in a solenoid *a*, having a hollow soft-iron core, through which the upper carbon *b* is fed. The clutching mechanism for effecting the feeding of the upper carbon as it is burned away forms no part of this invention and need not be described.

The upper carbon *b* is electrically connected with one end of the winding of the solenoid *a*, the other end of said winding being connected with the source of current-supply, such as one of the mains of a system of electrical distribution. The lower carbon *c* may be connected with the other main by way of the lower-carbon holder *c'* and the movable member *d'* of the side rod *d*. Electrical connection between the movable member *d'* and



the conductor  $e$ , however, is made by way of the separable switch members  $f'$   $f^2$ . The member  $f'$  may consist of a blade portion mounted stationarily upon a part of the frame-work  $a'$ , and the other switch member may consist of a spring clip or socket mounted upon the upper end of the movable member  $d'$  of the side rod. Fig. 1 shows the two members of the switch in engagement with one another, so that the lower carbon  $c$  will thus be electrically connected with the main  $e$ .

The member  $d'$  of the side rod is constructed to slide up and down upon the other member  $d^2$  in the following manner: At the upper end of the movable member  $d'$  a collar  $d^3$  is rigidly fastened, which is adapted to slide freely to and fro along the stationary member  $d^2$ . Likewise near the bottom of the member  $d^2$  a similar collar  $d^4$  is provided, rigidly secured thereto, but freely movable to and fro along the member  $d'$ . When the movable member is in its normal position, as illustrated in Fig. 1, the parts may be so maintained by a set-screw  $g$ , mounted upon the movable member  $d'$ , passing therethrough and engaging with a recess  $d^5$ , provided for that purpose in the lower end of the stationary member  $d^2$ . When the lower-carbon holder has been let down, as illustrated in Fig. 2, the collar  $d^3$  will engage with the collar  $d^4$  and prevent further relative movement—that is, will prevent the movable member from falling off entirely.

By reference to Fig. 2, it will be seen that the two members  $f'$  and  $f^2$  of the switch are automatically separated by the very act of letting down the lower-carbon holder. This of course will break the circuit of the lamp, and thus the possibility of the trimmer becoming burned by accidental contact with a current-conducting part will be avoided. When the burned carbons have been removed and fresh ones inserted in place thereof, the trimmer raises the lower-carbon holder into its normal position, thereby causing the two members  $f'$   $f^2$  of the switch automatically to engage with one another and establish the circuit of the lamp. He may then secure the parts in position by tightening the set-screw  $g$ .

It will be understood that my invention is applicable to electric-arc lamps of widely-differing characters, and the construction of the switching mechanism may be varied to a great extent without departing from the spirit of my invention. I do not wish, therefore, to be understood as limiting myself to the precise construction shown; but,

Having thus described my invention, I claim as new, and desire to secure by Letters Patent, together with such modifications as may be made by the exercise of mere mechanical skill and only with those limitations expressed or by law implied in view of the state of the related arts, the following:

1. In an electric-arc lamp, the combination with a pair of relatively-movable carbons and

means for regulating and feeding the same, of a movable support for one of said carbons; means for moving said support away from its normal position to permit the lamp to be trimmed, and switching mechanism associated with said movable carbon-support and operated by the movement thereof, said switching mechanism controlling the continuity of the lamp-circuit, whereby the circuit of the lamp will automatically be broken when the said carbon-support is moved away from its normal position, and completed when said carbon-support is replaced in its normal position, substantially as described.

2. The combination with a carbon-holder of an arc-lamp, of a mounting therefor permitting the same to be moved away from its normal position to permit the lamp to be trimmed; switching mechanism controlling the continuity of the lamp-circuit, and a connection between said carbon-holder and switching mechanism, whereby the latter is automatically actuated by the movement of said carbon-holder, substantially as described.

3. The combination with the lower-carbon holder of an arc-lamp, of a movable support therefor permitting the same to be let down to facilitate the trimming of the lamp; a movable switch member operated by said movable support; a complementary switch member associated with the lamp-frame and connected or adapted to be connected with a source of current, said movable switch member being disengaged from its complementary member when the lower-carbon holder is let down; and an electrical connection between said switch member and the lower-carbon holder, substantially as and for the purpose set forth.

4. The combination with the lower-carbon holder of an arc-lamp, of a side rod supporting said lower-carbon holder, said side rod being formed of two members movable relatively to one another, whereby the lower carbon may be let down to facilitate the trimming of the lamp, said lower-carbon holder being electrically connected with said side rod, an electrical connection normally existing between the side rod and a current-carrying part of the lamp, whereby current is supplied to the lower carbon, and means associated with the side rod for automatically breaking the last-mentioned electrical connection by the relative movement of the two parts of said side rod, substantially as described.

5. The combination with the lower-carbon holder of an arc-lamp, of a side rod supporting the same, said side rod having two members relatively movable longitudinally of one another, whereby said lower-carbon holder may be let down to facilitate the trimming of the lamp; a stationary switch member connected or adapted to be connected with a current-carrying portion of the lamp, and a complementary switch member normally engaging



therewith and electrically connected with the  
lower-carbon holder, but mounted upon the  
movable member of the side rod, whereby  
said switch members are automatically dis-  
5 engaged from one another by the letting down  
of said lower-carbon holder, substantially as  
described.

In witness whereof I hereunto subscribe my  
name this 25th day of November, A. D. 1898.

THOMAS E. DROHAN.

Witnesses:

DE WITT C. TANNER,  
A. L. LAWRENCE.