

(No Model.)

A. S. ATWATER.
ELECTRIC ARC LAMP.

No. 505,183.

Patented Sept. 19, 1893.

Fig. 4

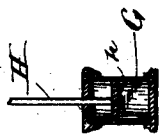


Fig. 1

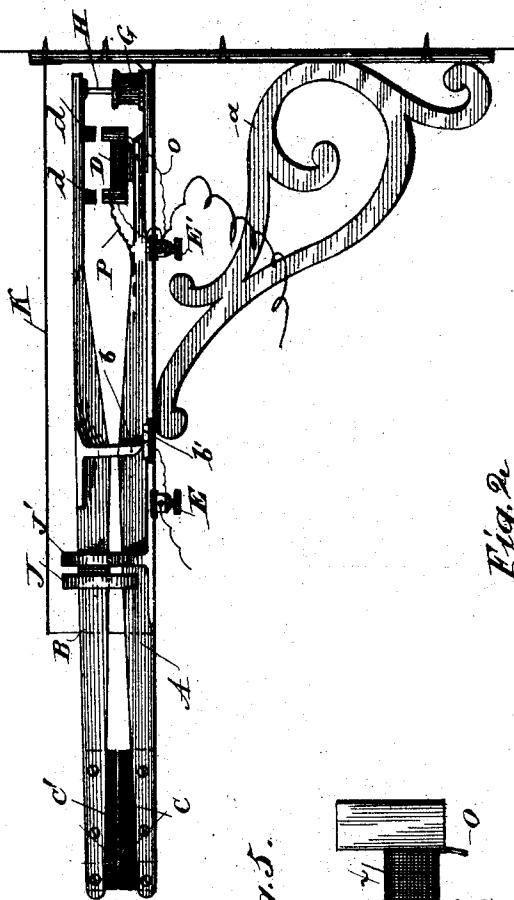


Fig. 3.

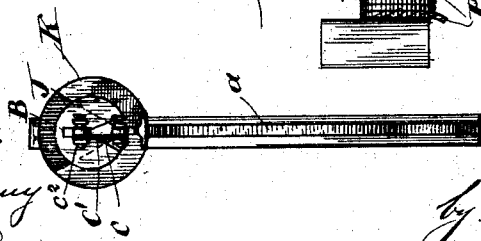


Fig. 2a

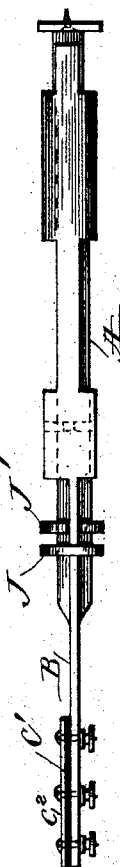
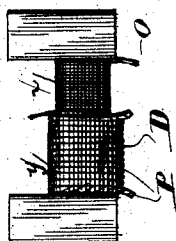


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

ARTHUR S. ATWATER, OF CLEVELAND, OHIO, ASSIGNOR TO THE ATWATER
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ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 505,183, dated September 19, 1893.

Application filed January 16, 1893. Serial No. 458,590. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR S. ATWATER, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Arc Lamps, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in arc lamps, and the objects are to provide a type of lamp which will be self sustaining and will require adjustment only at very long intervals. To accomplish these results I employ the distinctive mechanism, and combination and arrangement of the various parts hereinafter described, shown in the accompanying drawings, and more specifically pointed out in the claims.

In the drawings Figure 1, is a side elevation of my improved lamp. Fig. 2 is a plan view of the same. Fig. 3 is an end view. Fig. 4 is a vertical section of the dash pot, and Fig. 5 is a view of operating magnet.

In the drawings A is a horizontal metallic bar, mounted as a wall bracket by support *a*; B, is a bar similar in length to the bar A, and oscillating thereon upon the fulcrum point *b* which is placed considerably below the center line between the bars A, and B, the effect of this position being to insure a tendency of the carbon end of the bar B to fall toward the bar A, when the center of gravity had been displaced toward that end of the bars, the lower the point of fulcrum, the greater the displacement caused thereby.

C, C', are narrow flat carbon plates clamped to the outer extremities of the bars A and B by thin plates C² in such a manner as to touch throughout their adjacent edges, when the outer ends of the bars are brought together. Between these carbon edges is formed the arc.

In order to regulate the distance between the carbons and secure an unvarying arc, the magnet D, is secured to the inner end of the bar A, with corresponding armatures *d* on the bar B, the effect of this magnet being to pull down the armatures and separate the carbon edges whenever the edges of the carbon approach too near, so that the arc becomes too

short and the current too strong. The electrical connections are shown in the dotted lines in Fig. 1, the current being alternating.

E and E' are the binding posts. The current runs from binding post E' to the magnet D, thence along bar A to lower carbon C, thence forms the arc to upper carbon, thence runs upon the upper arm to fulcrum *b* which rests upon the insulated plate *b'* and thence out at post E. Both posts are insulated as shown.

G, is a dash pot placed upon the lower bar A, and H is a plunger upon the upper bar working therein. The valve *h* in the plunger will be seen to be so placed that the bars will separate freely and bring the carbons together, but the carbons will be separated with much more difficulty since the liquid will be more slowly displaced in the downward movement of the piston plunger.

J and J' are weather guards to preserve the fulcrum point *b* from rain driving under the cover K, omitted in Fig. 2.

It will be seen that the action of the lamp is automatic since any too great separation of the carbons weakens the current and the hold of the magnet, so that the carbons again approach until the requisite arc is formed between them. Again the arc once formed will travel from end to end of the plates of carbon, as it eats its way slowly, so that a long time will elapse before another adjustment will be necessary.

An additional shunt winding of fine wire X may be utilized to limit the power of the magnet and prevent excessive magnetism when the current is strongest. This is wound the reverse of the coarse wire Y and so tends to neutralize its effect, when the current is in excess of the usual capacity of the coarse wire. In Fig. 1 P and O represent the main and shunt circuits.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an arc lamp the combination of flat carbon candle plates having linear edges presented to one another for the formation of the arc, a stationary holder for the lower carbon and an oscillating upper holder whose fulcrum point is located upon the lower holder

at a point below the horizontal center line between said holders, substantially as described.

2. In an arc lamp, the combination of flat carbon candles having linear edges presented to one another for the formation of the arc between them, a rigid lower carbon holder, an oscillating upper carbon holder and means for adjusting the relative positions of the upper and lower carbon plates, consisting in the electro-magnet D, upon the lower holder, and armature or armatures upon the upper holder, substantially as described.

3. In an arc lamp, provided with flat carbon plate candles, the combination of a lower fixed carbon holder, an upper oscillating holder, and means for regulating the length of the arc between the plates, consisting in the magnet D on the lamp circuit, located upon one of the holders, and armatures upon the other holder, with a modifying shunt coil upon the

magnet reversely wound to the main circuit, substantially as described.

4. In an arc lamp provided with plate carbon candles having linear edges presented to one another for the formation of an arc, the combination of a fixed lower holder, and oscillating upper holder, with means for controlling the movement of the upper holder and length of the arc consisting in the electro-magnet D upon the lamp circuit placed on the lower holder, one or more armatures upon the upper holder, and a dashpot between said holders whereby an easy movement is given the oscillating arm in bringing the carbons together, but a difficult movement in separating them.

ARTHUR S. ATWATER.

Witnesses:

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JOHN T. LISTER.