

(No Model.)

D. HIGHAM.
ELECTRIC ARC LAMP.

No. 486,377.

Patented Nov. 15, 1892.

FIG. 1.

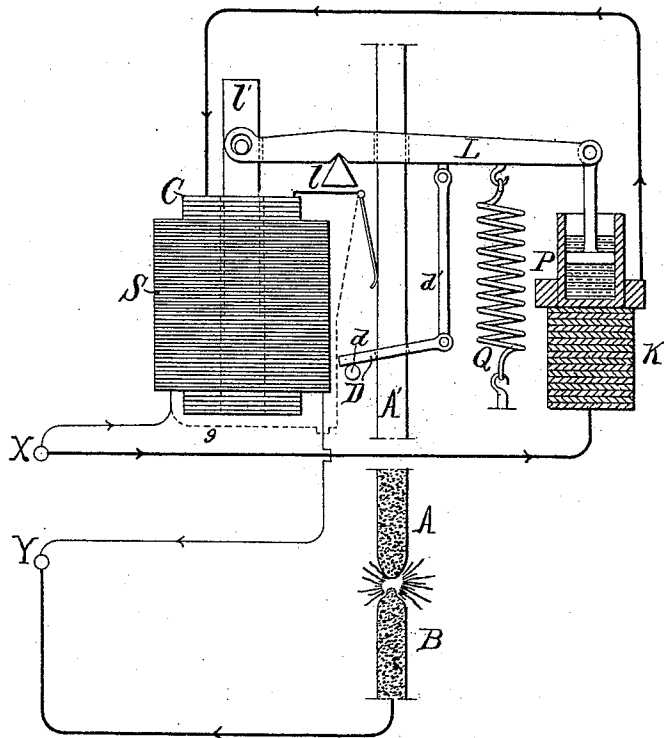
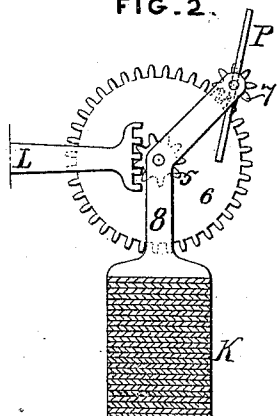


FIG. 2.



WITNESSES:

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INVENTOR

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BY

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UNITED STATES PATENT OFFICE.

DANIEL HIGHAM, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE HIGHAM ELECTRIC COMPANY, OF PORTLAND, MAINE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 486,377, dated November 15, 1892.

Application filed July 9, 1892. Serial No. 439,510. (No model.)

To all whom it may concern:

Be it known that I, DANIEL HIGHAM, a citizen of the United States, and a resident of Boston, Massachusetts, have invented certain
5 Improvements in Electric-Arc Lighting, of which the following is a specification.

This invention relates to electric-arc lighting; and the object of the invention is to provide means whereby the feeding of the carbon of an arc lamp in a circuit will not materially affect the current supplied to the other arc lamps in the same circuit, the general object being to increase the stability and steadiness of the current.

15 In the accompanying drawings, Figure 1 represents diagrammatically a simple and well-known form of clutch-lamp having differential coils and provided with my improvements. Fig. 2 is a view illustrating a modification which may be employed in carrying
20 out my invention.

Referring to the particular construction of arc lamp illustrated in Fig. 1, A represents the upper carbon carried by the movable carbon-holder A', while B represents the lower
25 fixed carbon. The upper movable carbon or carbon-holder is controlled by a clutch D, one end of which rests upon a support *d* on the frame, while the other end is connected through a link *d'* to a lever L, pivoted at *l*. One arm
30 of this lever carries a solenoid-core *l'*, acted on by a coarse-wire coil C in the main circuit, which tends to draw the core within the coil, and also acted upon by a fine-wire coil S in a
35 shunt-circuit, which tends to move the core *l'* in a direction the opposite of that imparted to it by the coil C. A spring Q may be employed to act upon the lever L against the magnetic action of the coil C. The same arm
40 of the lever L which is provided with the spring Q has a yielding connection with a variable resistance K in the main circuit. In the construction shown in Fig. 1 this yielding connection is through the medium of a dash-
45 pot P, while in the construction illustrated in Fig. 2 the yielding connection is through a rotary fan P'. In this modification, Fig. 2, the outer end of the arm L has a segmental gear meshing with a pinion 5, having on the
50 same shaft the gear-wheel 6, meshing with a

pinion 7 on the axis of the fan, the pinions and gear-wheel 5 6 7 being carried by an arm or arms 8, connected with the variable resistance K. In both modifications the variable resistance is shown as consisting of a series of carbon plates K, the conductive property of which is lessened or increased by the pressure brought to bear thereon by the lever L. The circuits are as indicated by the arrows in Fig. 1, the fine-wire coil S being
55 connected in shunt between the terminals X Y of the lamp. I would here mention, however, that it is not essential that this shunt-coil S should be connected around the whole lamp, including the variable resistance K, for the
60 lamp could be adjusted to work with almost equally satisfactory results if the shunt-coil S were connected around the arc alone, as indicated by the dotted line 9, as will be readily understood.
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The operation is as follows: Imagine the lamps to be all adjusted and when burning quietly the movable carbon of one of the lamps to feed down a little too much. The result, of course, will be that the shunt-coil S,
75 which opposes the effect of the series coil C, will be weakened, thus causing the coil C to ease up the weight or pressure upon the carbon plates K through the dash-pot P, and thereby to increase the resistance in the main
80 circuit of the lamp to compensate for the fall of resistance at the arc. As the dash-pot or other yielding connection will gradually let go, however, the resistance of the plates K will gradually come back to its normal condition,
85 and likewise gradually reduce the current in the shunt-coil S to allow the series coil C to gradually raise the movable carbon until the normal potential is restored at the arc. If, on the other hand, the currents applied to the
90 lamp should drop or rise in intensity, the effect will be to increase the resistance at K when the current rises and to decrease the resistance at that point when the current falls. This, as will be readily understood, is
95 a very valuable feature for insuring steadiness of current in the working circuit.

It will be readily understood that although I have illustrated but one form of arc lamp with my improvements applied, they may be
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employed in connection with various other forms of arc lamps.

I claim as my invention—

1. An electric-arc lamp provided with carbon-feeding mechanism, in combination with a variable resistance connected in series with the carbons and a yielding connection between the feeding mechanism and the variable resistance, whereby the latter is acted upon by the feeding mechanism to compensate for variations of the resistance at the arc, substantially as described.
2. An electric-arc lamp provided with carbon-feeding mechanism, in combination with a variable resistance connected in series with the carbons and means whereby said variable resistance is acted upon by the current supplied to the lamp through the medium of a yielding connection, substantially as and for the purpose set forth.
3. An electric-arc lamp provided with differential coils and carbon-feeding mechanism controlled thereby, in combination with a variable resistance and a yielding connection between the feeding mechanism and the said resistance, substantially as and for the purpose set forth.

4. An electric-arc lamp provided with a carbon-feeding mechanism, in combination with a variable resistance connected in series with the carbons, a yielding connection between said feeding mechanism and variable resistance, and means whereby the current supplied to the lamp increases the variable resistance when the current rises in intensity and decreases the variable resistance when the current falls in intensity.

5. An electric-arc lamp having shunt and series coils and carbon-feeding mechanism controlled thereby, in combination with a variable resistance in series with the lamp and means whereby the said variable resistance is acted upon through the medium of a yielding resistance by the shunt-coil to reduce its resistance and by the series coil to decrease its resistance, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DANIEL HIGHAM.

Witnesses:

HARRY SMITH,
HUBERT HOWSON.