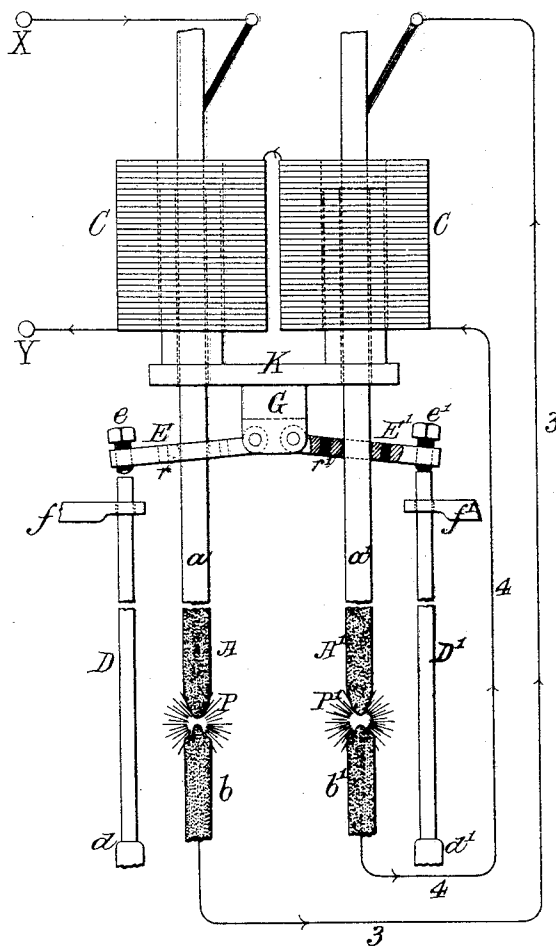


(No Model.)

D. HIGHAM.
ELECTRIC ARC LAMP.

No. 543,243.

Patented July 23, 1895.



WITNESSES:

George Baumann
S. C. Connor

INVENTOR

Daniel Higham
BY
Howson and Howson
his ATTORNEYS.

UNITED STATES PATENT OFFICE.

DANIEL HIGHAM, OF BOSTON, MASSACHUSETTS.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 543,243, dated July 23, 1895.

Application filed May 2, 1895. Serial No. 547,858. (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, Middlesex county, Massachusetts, have invented an Electric-Arc Lamp, of which the following is a specification.

This invention relates to electric-arc lighting, but more particularly to constant potential arc lighting; and its object is to provide means whereby two or more sets of carbons can be burned in series in one lamp with less mechanism than has been employed heretofore, as more fully explained hereinafter.

The type of arc lamp now in use, in which two sets of carbons are burned in series, is known as a "twin" lamp and has two sets of feeding mechanisms in which shunt-windings are employed to control the proper length of each respective arc, and also suitable cut-outs are employed to save the burning out of a shunt-winding (when the carbons are consumed) by opening the circuit of the shunt-winding which controls the length of the arc of the set of carbons which burn out first, as is well known to the art.

It is the object of this invention to do away with the use of shunt-windings, and consequently with the need and use of cut-outs, and to produce means by which two sets of carbons can be burned in series in one lamp without the use of two sets of feeding mechanisms in the sense meant by a twin lamp.

The view in the accompanying drawing is a diagram illustrative of the present invention as applied to a lamp having two sets of carbons connected in series.

A and A' represent the upper carbons carried by movable holders *a* and *a'*, while *b* and *b'* represent the lower or fixed carbons. Acting upon the movable holders *a* and *a'* are clutches E and E', provided with insulated bushings *r* and *r'*, to prevent direct electrical connection of the carbon-holders with each other. At the outer ends of the clutches are adjustable screws *e* and *e'*, which are adapted to touch upon rods D and D', adjacent to the carbons. The other ends of the clutches are carried by a hanger G, forming part of a U-shaped solenoid core K, through which the carbon-holders are shown as passing for clearness of illustration, and this solenoid core is magnetically acted upon by the series windings or

coils C. The rods D and D' are fixed to the frame of the lamp at *d* and *d'* and are made of copper or other material which will expand readily by the heat given out from the arcs. The other ends of the rods D and D' are supported by the frame at *f* and *f'*. The adjustment of screws *e* and *e'* should be such that when touched upon rods D and D' both clutches will release, as near as possible, both carbon-holders at the same time, and the series windings or coils C should be such that the desired or normal current will just sustain the weight of the solenoid core, clutches, and carbon-holders to maintain the arcs.

The circuit between the lamp terminals X and Y is indicated by the arrows and is as follows: From the incoming binding-post X the current flows through the carbons A *b* and arc P, thence through conductor 3 to the carbons A' *b'* and arc P', thence through conductor 4 to the series coils C C and outgoing binding-post Y.

The operation is as follows: When current is first switched on (from a suitable constant potential circuit having a suitable resistance in the lamp branch) the series coils C will draw up the solenoid core K and engage the clutches E and E' with the carbon-holders *a* and *a'* to draw the proper length of arcs. As the carbons burn away at the points the coils C will lower down the solenoid core K, clutches E and E', and carbon-holders *a* and *a'* until the screws *e* and *e'* on the clutches touch on the rod D and D' and release the clutches from the carbon-holders, but if it should happen that arc P, for instance, would not burn its carbons as much as arc P', as illustrated in the drawing, then rod D' will be heated up from the heat of the adjacent arc P' more than rod D will be heated from its adjacent arc P, whereby rod D' will be expanded in length more than rod D and will cause clutch E' to release its carbon-holder *a'* without disengaging clutch E, and so on. The carbon-holder having the longest arc at its carbon points will always be fed down and the normal length of each arc will be approximately maintained, as will be readily understood without further description.

Although I have illustrated but one form of arc lamp embodying my invention, it should be understood that various other forms or ar-

rangements and modifications could be easily devised by any one skilled in the art without departing from the scope of my invention.

I claim as my invention—

- 5 An electric arc lamp, having electric arcs connected in series, suitable feeding mechanism provided with series magnet windings controlling the same to regulate the current at the desired or normal amount and means
10 whereby the normal lengths of said arcs are

maintained by the heat given out by said arcs, substantially as described.

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

DANIEL HIGHAM.

Witnesses:

E. A. WOODBURY,
A. N. BONNEY.