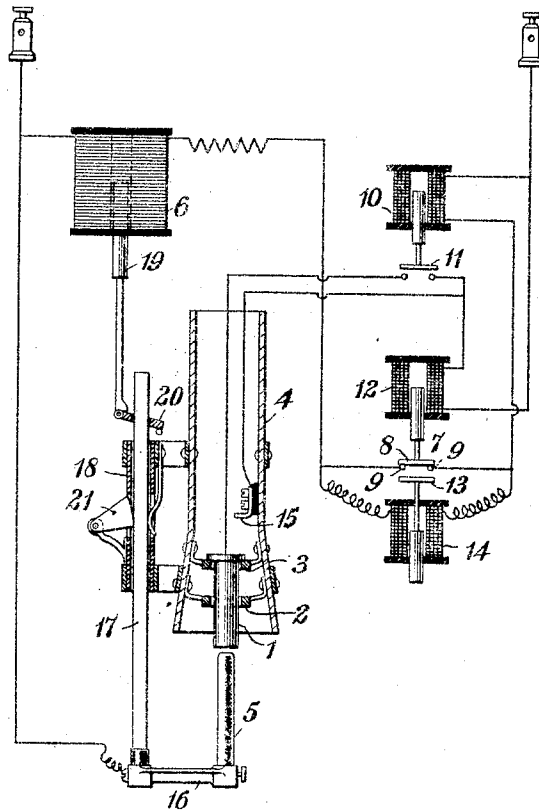


G. M. DYOTT & C. CARSON.
ARC LAMP.

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999,761.

Patented Aug. 8, 1911.



WITNESSES:

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GEORGE M. DYOTT, OF PITTSBURG, AND CLARENCE CARSON, OF WILKINSBURG, PENNSYLVANIA, ASSIGNORS TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

ARC-LAMP.

999,761.

Specification of Letters Patent.

Patented Aug. 8, 1911.

Application filed April 28, 1906. Serial No. 314,212.

To all whom it may concern:

Be it known that we, GEORGE M. DYOTT, a subject of the King of Great Britain, and CLARENCE CARSON, a citizen of the United States, and residents, respectively, of Pittsburgh and of Wilkesburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Arc-Lamps, of which the following is a specification.

Our invention relates to arc lamps and particularly to those in which the electrodes are of such compositions as are adapted to produce what are commonly known as "flaming" or "luminous" arcs.

The object of our invention is to provide such a structure and arrangement of the parts and such an arrangement of the circuits of lamps of the character specified as will render them more efficient and satisfactory in operation than others heretofore provided.

The single figure of the accompanying drawing illustrates diagrammatically, the structure and the circuits of an arc lamp that embodies our invention.

Arc lamps have heretofore been provided with composition electrodes of such character as to be less rapidly consumed than ordinary carbon electrodes and to also be productive of arcs that are more luminous than those produced by the ordinary electrodes. An electrode of this character which has been found suitable in practice has been composed of a mixture of magnetic oxid of iron, which is a conductor both when hot and when cold and which gives conductivity to the electrode, oxid of titanium which imparts appropriate color and brilliancy to the arc, and oxid of chromium which steadies the arc and prevents the electrodes from being rapidly consumed, these substances being combined in varying and suitable proportions. Other compositions of materials having similar or suitable properties may also be employed. With such an electrode, fumes are given off from the arc and are condensed and deposited on the cooler parts

of the lamp, the deposit being chiefly composed of the oxids that constitute the electrode. It is usual to employ the composition electrode as a cathode in combination with a copper, iron or other metallic positive electrode, upon which the deposit often collects in such quantities as to obscure a portion of the light and otherwise interfere with the operation of the lamp, particularly when the cathode is located beneath the anode. According to the present invention, the parts of the lamps are so constructed and arranged that the deposit will be removed from the sides of the metallic electrode whenever the lamp is lighted or feeding of the electrodes occurs.

In the single figure of the accompanying drawing, which is a diagrammatic view of the arrangement of the circuits and the structure of a lamp constructed in accordance with our invention, an electrode 1 that is composed of copper or iron or another suitable metal or metals, is mounted so as to be capable of reciprocating motion within closely fitting rings 2 and 3 that are mounted in the interior of a tube or chimney 4, having its lower end flared, whereby the fumes are removed from the lamp.

An anode or electrode 5 that may be composed, as before described, of the oxids of metals such as iron, titanium and chromium, is adapted to be operated or fed by means of a magnet winding 6. In circuit with the magnet winding 6 is a switch 7 comprising a movable member 8 and stationary contact terminals 9, and an operating magnet winding 10 for a normally closed switch 11 that is in circuit with the electrodes 1 and 5 and with an operating magnet winding 12 for the switch 7. A switch member 13 that is adapted, when raised, to connect the contact terminals 9 together, is adapted to be operated by a comparatively high resistance magnet winding 14 that is connected around the contact terminals 9,—this winding being energized when the voltage between the contact terminals rises above a predetermined value.

In order that feeding of the electrode 5 may be effected when the distance between it and the electrode 1 exceeds a predetermined amount, a supporting arm 16 for the electrode 5 is carried by a rod 17 that operates in a stationary tube 18 of somewhat larger diameter, the rod 17 being operatively connected to core 19 for the magnet winding 6 by means of a ring clutch 20, or other suitable mechanism. The rod 17 is free to move upwardly within the tube 18, but its downward movements are limited by means of a cam clutch 21 that presses the rod 17 firmly against the side of the tube 18 when a predetermined downward movement thereof has occurred.

When current is first supplied to the lamp, it will traverse magnet winding 6, switch 7 and magnet winding 10. The magnet winding 6, being thus energized, causes the lower electrode 5 to be drawn upwardly into engagement with the electrode 1 which is thereby raised into engagement with a stop 15 that is connected to one terminal of the magnet winding 12.

The switch 11 being open when the electrodes are first brought into engagement, by reason of the energizing of magnet winding 10, a circuit will not be established through the electrodes of the lamp until the upper electrode 1 engages the stop or circuit terminal 15, short-circuiting of the switch 11 being thereby effected. Magnet winding 12 now becomes energized and the switch member 8 is raised, the high resistance magnet winding 14 being thereby included in circuit with magnet windings 6 and 10. This so reduces the amount of current traversing the circuit that the lower electrode 5 drops to its lowermost position and the switch 11 closes. A circuit is then established through and between the electrodes and through switch 11 and magnet winding 12. Operation of the lamp will continue under these conditions until the distance between the electrodes increases to such an extent that the voltage between the contact terminals 9 rises above the predetermined value at which the magnet winding 14 becomes sufficiently energized to enable it to raise the switch member 13, whereupon the lower electrode will be again drawn upwardly until the electrode 1 engages the stop 15, the operations occurring as before described. Each time the upper electrode is raised into engagement with the stop 15; that is, in starting the lamp and each time feeding of the lower electrode occurs, the rings 2 and 3 serve to brush off or remove any deposit that may have formed on the sides thereof.

We claim as our invention:

1. In an arc lamp, the combination with a pair of electrodes, a circuit terminal, and

a magnet winding for moving the electrodes into engagement with each other and one of them into engagement with the circuit terminal, of a switch in circuit with the electrodes, and having one of its contact members connected to the circuit terminal, a switch in circuit with the electrode actuating magnet winding, and magnet windings respectively for the said switches, that for each switch being in circuit with the other switch.

2. In an arc lamp, the combination with a pair of electrodes, a circuit terminal, and a magnet winding for moving the electrodes into engagement with each other and one of them into engagement with the circuit terminal, of a switch in circuit with the electrodes and having one of its contact members connected to the circuit terminal, a switch in circuit with the electrode actuating magnet winding, magnet windings respectively for the said switches, that for each switch being in circuit with the other switch, and a second switch controlling the circuit of the electrode actuating magnet winding having a magnet winding that is connected across the terminals of the said second switch.

3. In an arc lamp, the combination with a pair of electrodes, a circuit terminal, and a magnet winding for moving the electrodes into engagement with each other and one of them into engagement with the circuit terminal, thereby establishing a circuit through the electrodes, of means for preventing establishment of the said circuit until one of the electrodes is moved into engagement with the circuit terminal, and means for rendering the said magnet winding ineffective when one of the electrodes is moved into engagement with the circuit terminal.

4. In an arc lamp, the combination with a pair of electrodes, a circuit terminal, and a magnet winding for moving the electrodes into engagement with each other and one of them into engagement with the circuit terminal, thereby establishing a circuit through the electrodes, of means for preventing establishment of the said circuit until one of the electrodes is moved into engagement with the circuit terminal, and means for rendering the said magnet winding ineffective when one of the electrodes is moved into engagement with the circuit terminal, and means for restoring the effectiveness of the magnet winding when the resistance of the arc exceeds a predetermined amount.

5. In an arc lamp, the combination with a pair of electrodes, a circuit terminal, and a magnet winding for moving the electrodes into engagement with each other and one of them into engagement with the circuit terminal, thereby establishing a circuit through the electrodes, of means for prevent-

ing establishment of the said circuit until
one of the electrodes is moved into engage-
ment with the circuit terminal, and means
for rendering the said magnet winding in-
5 effective when one of the electrodes is moved
into engagement with the circuit terminal,
and means for brushing the surface of the
electrode that is moved into engagement
with the circuit terminal when such action
10 occurs.

In testimony whereof, we have hereunto
subscribed our names this 13th day of April,
1906.

GEORGE M. DYOTT.
CLARENCE CARSON.

Witnesses:

OTTO S. SCHAIRER,
S. M. C. JONES,
BIRNEY HINES (as to both.)