

G. M. LITTLE.
ARC LAMP HAVING MAGNETIZABLE ELECTRODES.
APPLICATION FILED MAY 10, 1906.

933,769.

Patented Sept. 14, 1909.

Fig. 1.

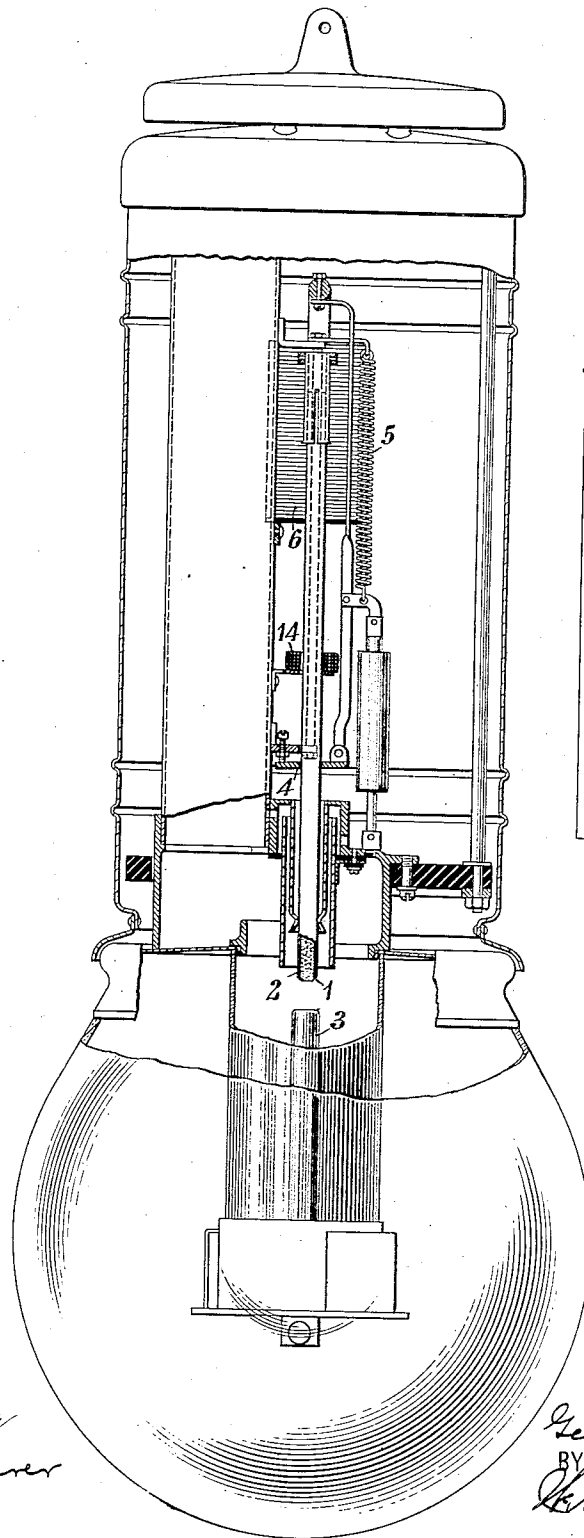
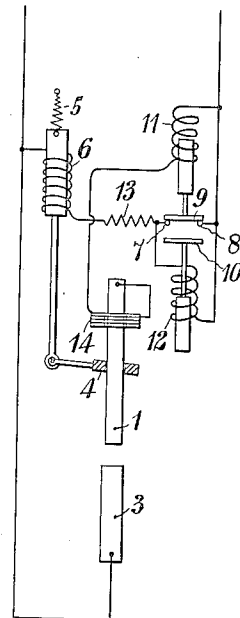


Fig. 2.



WITNESSES:

C. L. Belcher
O. S. Schaner

INVENTOR

Geo. M. Little
BY
Arley C. Carr
ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE M. LITTLE, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE
ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

ARC-LAMP HAVING MAGNETIZABLE ELECTRODES.

933,769.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed May 10, 1906. Serial No. 316,134.

To all whom it may concern:

Be it known that I, GEORGE M. LITTLE, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Arc-Lamps Having Magnetizable Electrodes, of which the following is a specification.

My invention relates to arc lamps and particularly to those in which electrodes containing magnetizable materials are employed.

The object of my invention is to provide means for neutralizing magnetic fields that may be produced by external means in electrodes of the character indicated.

Electrodes for arc lamps are frequently composed of magnetic oxid of iron and oxids of titanium and chromium, or of other suitable substances, that are contained in iron tubes. In the use of such electrodes it has been found that the arc is frequently distorted and lengthened to such a degree as to seriously interfere with the operation of the lamp, and I have discovered that the distortion and lengthening of the arc has been the result of the magnetization of the electrodes by stray magnetic fields from the operating magnets of the lamps.

According to the present invention I propose to neutralize the stray magnetic fields by placing either a permanent or an electro-magnet in a suitable relation to the magnetizable electrode.

Figure 1 of the accompanying drawing is a view in elevation of an arc lamp that embodies my invention, a portion of the casing being broken away for the sake of clearness of illustration, and Fig. 2 is a diagrammatic view of the circuits of the lamp of Fig. 1.

An electrode 1, that may be composed mainly of magnetic oxid of iron and oxids of titanium and chromium, or of other suitable materials, contained within an iron or other magnetic tube 2, is adapted to be moved downwardly into engagement with a stationary electrode 3 and to be adjusted in position with reference thereto by any suitable means generally employed for this purpose. As here shown, the electrode is supported by means of a clutch 4 that may be moved downwardly against the tension of a spring 5 by means of an electro-magnet having a winding 6. A pair of contact terminals 7 and 8 are interposed in the circuit of

the magnet winding 6 and are adapted to be electrically connected by means of either of switch members 9 and 10, the former of which engages the contact terminals when no current is supplied to the lamp. The switch member 9 is provided with an operating magnet winding 11 that is connected in series with the electrodes 1 and 3, and the switch member 10 is provided with an operating magnet winding 12 of comparatively high resistance the terminals of which are connected to the contact terminals 7 and 8.

When current is supplied to the lamp it first traverses magnet winding 6, a resistance 13, and switch member 9. The clutch 4 and the electrode 1 will then be moved downwardly until the latter engages the electrode 3, when a circuit will be established through the electrodes 3 and 1, a coil 14, and the winding 11. The winding 11 thereupon raises the switch member 9 and the high resistance winding 12 is thereby included in circuit with the winding 6. The magnetizing effect thus becomes so much reduced that the spring 5 is permitted to raise the clutch 4 and separate the electrodes 1 and 3. An arc is thus started which continues until the voltage applied to the winding 12 is increased to such an extent, by reason of the lengthening of the distance between the electrodes, as to enable its magnetizing effect to raise the switch member 10, when the circuit of the magnet winding 6 will be established in the same manner as when starting.

It will be observed that the magnet windings of the lamp are located in such close proximity to the upper end of electrode 1 that stray magnetic fields may magnetize the magnetizable materials and the iron shell of the upper electrode. In order to prevent the distortion and lengthening of the arc which has heretofore occurred as a result of the magnetization of the electrode, I employ the coil 14 the electrical dimensions of which are so adjusted that the magnetism produced thereby opposes and neutralizes the stray magnetism from the other windings of the lamp. Since the magnet winding 11 is energized when the lamp is in operation, the stray magnetism therefrom will interfere most with the operation of the lamp, and the coil 14 is therefore connected in series therewith so that the neutralizing effect afforded by the coil 14 will

vary approximately in proportion to the stray magnetism.

I claim as my invention:

1. The combination with an arc lamp
5 electrode that contains magnetizable material, of a magnet winding that surrounds the electrode and is connected in series relation therewith.
2. The combination with an arc lamp
10 electrode that contains magnetizable material, of means for neutralizing magnetism

that may be produced therein by external means comprising an electro-magnet winding that surrounds the electrode.

In testimony whereof, I have hereunto
subscribed my name this 1st day of May,
1906.

GEORGE M. LITTLE.

Witnesses:

OTTO S. SCHAIRER;
BIRNEY HINES.