

No. 869,301.

PATENTED OCT. 29, 1907.

R. FLEMING.
ARC LAMP ELECTRODE.
APPLICATION FILED MAR. 26, 1903.

Fig. 1.

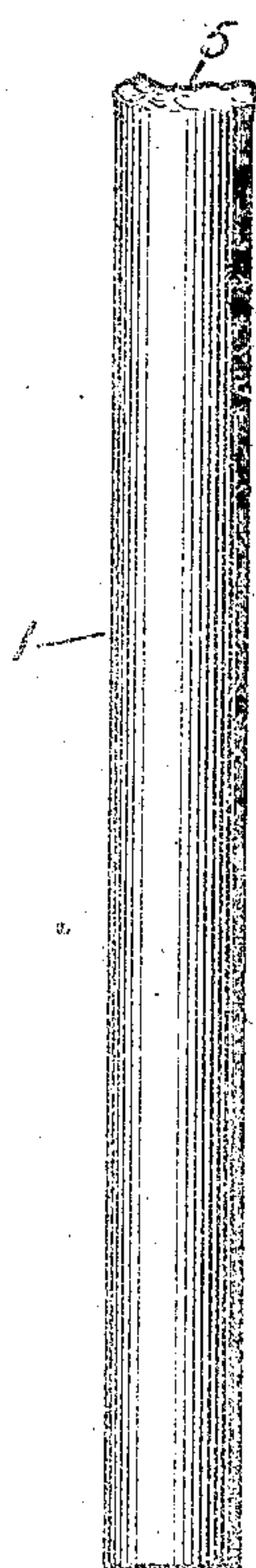


Fig. 2.

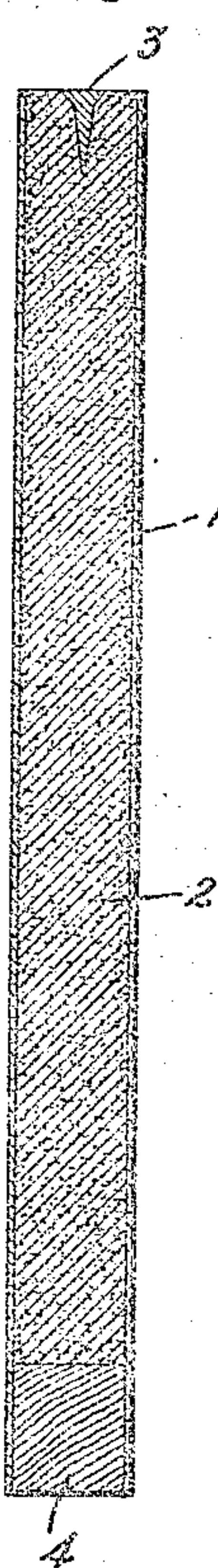
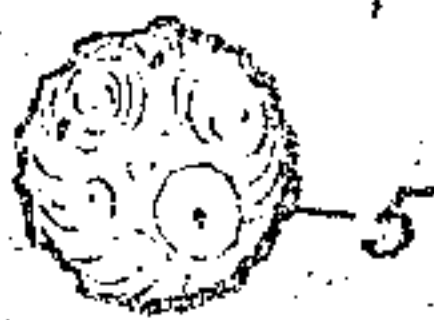


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

RICHARD FLEMING, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ARC-LAMP ELECTRODE.

No. 869,301.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed March 26, 1903. Serial No. 149,670.

To all whom it may concern:

Be it known that I, RICHARD FLEMING, a citizen of the United States, residing at Lynn, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Arc-Lamp Electrodes, of which the following is a specification.

The object of my present invention is the construction of an electrode which will give a luminous arc of high efficiency and which at the same time possesses good mechanical features. This object I attain by the use of a comparatively thin iron tube or shell into which a mass of magnetic oxid of iron, Fe_3O_4 , is placed filling the tube or shell for a considerable portion of its length. As the magnetite in the condition in which it is ordinarily put in the tube is a poor conductor of electricity, it is necessary to make the arc end of the electrode conducting in order that the arc may be readily started. This may be done by fusing over the end of the electrode, whereupon the fused mass formed at the end of the electrode becomes sufficiently conducting to allow of the arc being readily started.

In operation, the metallic iron of which the tube is made and the magnetite fuse together at the arc end of the electrode, the metallic iron being converted into oxids of iron, the most of it being converted into magnetite. Vaporization slowly takes place from this fused mass giving a highly luminous arc.

Instead of employing magnetite alone as the material with which the tube or shell is filled, other materials may easily be mixed with the magnetite by means of which the character of the light produced may be altered in various ways, as it is apparent that this form of electrode is peculiarly adapted for such changes of composition.

For a better understanding of my invention, reference may be had to the accompanying drawings in which I have illustrated one embodiment of my invention.

Of the drawings, Figure 1 represents an elevation of a completed electrode made in accordance with my in-

vention, Fig. 2 is a sectional elevation showing the construction of my electrode prior to the time at which the arc end is fused over, and Fig. 3 shows the appearance of the arc end of the electrode after fusion.

Referring to the drawings, 1 represents an iron tube, and 2 represents a filling therefor of magnetic oxid of iron (Fe_3O_4) or magnetic oxid of iron mixed with other materials in a granular form. The granular material is packed tightly in the tube. A piece of metal 3 such as a tack may be inserted in the granular material at the arc end of the electrode to assist in starting and directing the fusing arc. The opposite end of the tube may be filled with a plug 4 of some suitable material which retains the granular material in the tube. After fusing over, the arc end of the electrode assumes the somewhat irregular outline indicated at 5. The powdered material filling the tube is a poor conductor under normal conditions and in operation the current is carried to the arc end of the electrode from the terminal clamp by the metal tube. The mass formed at the arc end of the electrode by fusion is conducting even when cold, however, so that the arc may be readily started.

What I claim as new and desire to secure by Letters Patent of the United States, is—

1. An electrode consisting of an iron tube filled mainly with iron oxid.
2. An electrode consisting of an iron tube filled mainly with the magnetic oxid of iron.
3. An electrode consisting of a metal tube filled mainly with an oxid of the metal.
4. An electrode consisting of an iron tube and a filling therefor composed principally of powdered oxid of iron, one end of said tube and its filling being fused together to form a conducting mass.
5. An electrode composed essentially of a metal and a refractory oxid of the metal, the metallic oxid being such as to give a luminous or flaming arc in consuming.

In witness whereof, I have hereunto set my hand this 23rd day of March, 1903.

RICHARD FLEMING.

Witnesses:

DUGALD MCK. MCKILLOP.
JOHN J. WALKER.