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ELECTRODE FOR ELECTRIC ARC LAMPS.

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944,139.

Patented Dec. 21, 1909

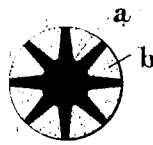


Fig. 2.

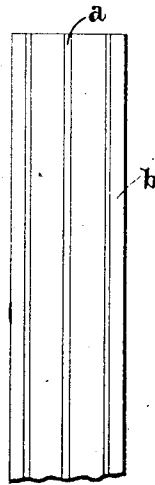


Fig. 1.

Attest:

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UNITED STATES PATENT OFFICE.

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ELECTRODE FOR ELECTRIC-ARC LAMPS.

944,139.

Specification of Letters Patent.

Patented Dec. 21, 1909.

Application filed April 18, 1908, Serial No. 427,824. Renewed October 11, 1909. Serial No. 522,124.

To all whom it may concern:

Be it known that I, ADRIAN DENMAN JONES, a subject of the King of Great Britain and Ireland, and residing at Hartham Works, Hartham Road, Holloway, London, N., England, have invented certain new and useful Improvements in Electrodes for Electric-Arc Lamps, of which the following is a specification.

My invention relates to electrodes particularly adapted for use in electric arc lamps of the inclosed type in which the arc is burned in an inclosure substantially airtight.

I have found that for successful working of inclosed arc lamps using carbon carrying chemicals it is necessary that the chemicals added should give off vapors having a high vapor density and thus forming a comparatively small arc and therefore a small region within which the electrical energy is dissipated, the effect of this being to raise the vapors in the arc to a high degree of incandescence giving a high light efficiency. I have also found that it is desirable to add salts having a high melting point and for this reason it is desirable to add a steady salt which acts as a flux in melting the chemicals to form a uniform liquid before vaporization. I find that with such mixtures no liquid slags are formed and therefore the troubles caused in other lamps in which chemicals are used are completely avoided.

My invention consists in electrodes carrying a mixture of salts of high melting point and high vapor density and so arranged relatively to the carbon that a good contact can always be obtained by placing the ends of the electrodes together.

My invention further consists in compound electrodes for electric arc lamps carrying a mixture of calcium tungstate and calcium fluorid with the addition of sodium or potassium salts.

The invention consists more specifically in compound carbons for inclosed electric arc lamps containing a mixture of calcium fluorid, calcium tungstate and sodium tungstate or potassium sulfate.

The invention also consists in arranging the chemicals in flutings in the carbons so that a solid core of carbon is always provided and enables a good contact to be made

through the electrodes whenever they are placed together.

Referring to the accompanying drawings, Figure 1 shows an elevation, and Fig. 2 a horizontal section of an electrode according to my invention.

In carrying the invention into effect according to one modification I form the carbon with a central core, *a*, having hollow flutings, *b*, surrounding it. Both carbons for an arc lamp may be formed in a similar manner or if only one carbon is to contain chemicals the positive carbon should be the one so formed.

The flutings in the carbon of the electrode are filled up with a mixture of chemicals held together and bound to the carbon by means of any suitable binder such as dextrin solution. For the purpose of the paste I form a mixture of one part of calcium tungstate and one part of calcium fluorid and with this I mix one half part of sodium tungstate or potassium sulfate. With electrodes of this kind when used in an inclosed arc lamp the arc formed is long and narrow and with a current of 5 amperes at 70 volts may be one inch long and is quite thin. The electrodes may be of considerable dimensions and the positive electrode is preferably placed at the bottom. The electrodes are preferably used in an inclosure of the kind described in my Patent No. 935,518, issued Sept. 28, 1909.

In an arc lamp having the carbons fluted as described the lower carbon tends to burn away to a point and the point will therefore always consist of pure carbon so that when the arc is broken and the electrodes are again brought together there will be a contact of pure carbon between the positive and negative electrodes so that the arc is readily re-started.

I find that the mixture of chemicals I have above described greatly increases the efficiency of the lamp; calcium tungstate alone would give the arc a purple-white color, while calcium fluorid gives a whitish-yellow color; the two together, however, give a brilliant yellow of many times the luminosity given by either separately. The object of the addition of the sodium tungstate or potassium sulfate is to steady the arc, and I find that the mixture I have above described gives extremely satisfactory results

as the arc retains its color and efficiency and burns steadily in inclosures shut off from atmospheric air.

Having thus described my invention what
5 I claim as new and desire to secure by Letters Patent is:—

1. Compound electrodes for electric arc lamps carrying a mixture of calcium tungstate and calcium fluorid, as set forth.
- 10 2. Compound electrodes for electric arc

lamps carrying a mixture of calcium tungstate, calcium fluorid and a steadying salt of an alkali metal, as set forth.

In testimony whereof, I affix my signature in presence of two witnesses.

ADRIAN DENMAN JONES.

Witnesses:

W. G. BISHOP DOWLING,
H. D. JAMESON.