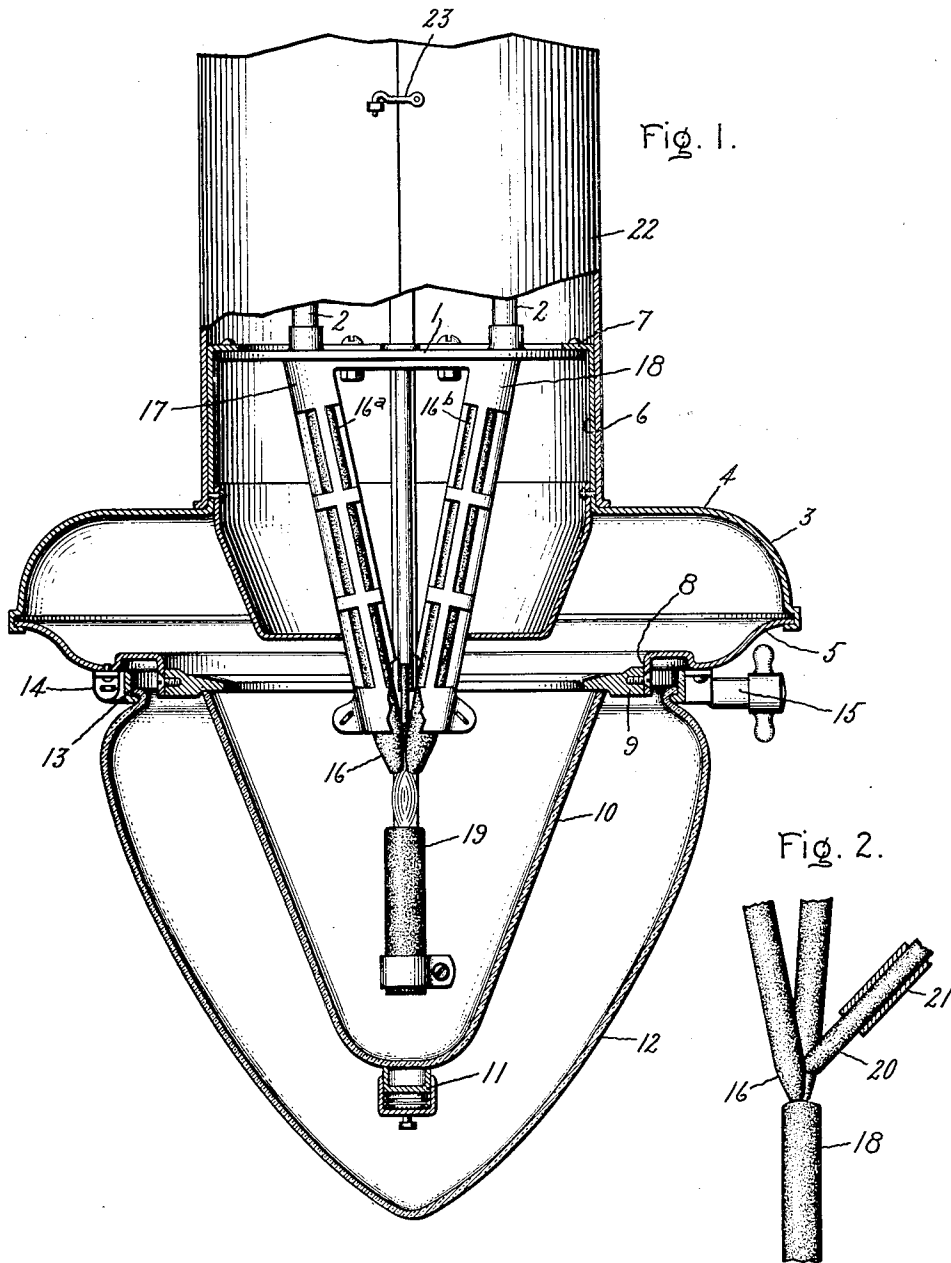


J. T. H. DEMPSTER.
ARC LAMP.
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1,132,307.

Patented Mar. 16, 1915.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN T. H. DEMPSTER, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ARC-LAMP.

1,132,307.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN T. H. DEMPSTER, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented new and useful Improvements in Arc-Lamps, of which the following is a specification.

My invention has reference to an arc lamp of the flaming type.

It has heretofore been proposed to make electrodes which will support a flaming arc by mixing a salt or salts, the vapors from which are adapted to impart luminosity to the arc, with carbon, and make electrodes from such mixture. With electrodes of this character the arc is formed and supported by the carbon, while the vapors from the salt or salts are evaporated and carried into the arc and give luminosity to the same.

My invention comprises an arrangement whereby the light giving materials are introduced into the arc independently of the electrode, and more particularly covers an arrangement wherein a separate fusible bar or rod formed of such light giving materials is fed into engagement with one of the electrodes at such a point that the material is fused by the heat from the arc and is vaporized into the arc.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view, partly in elevation, showing a lamp in which my invention is embodied, and Fig. 2 is a side elevation showing the arrangement of the electrodes.

I have shown my invention embodied in an arc lamp of the inclosed type, although it will be understood that it is not limited to this character of lamp.

In the drawings, 1 is the bottom plate of the lamp secured to and supported by suitable spacing bars 2. The lamp which I have shown comprises a rather large flat condensing chamber 3 in which the fumes from the arc are deposited. This chamber is formed by an upper member 4 and a lower member 5 suitably joined together. The upper member 4 is provided at its inner edge with a vertical cylindrical extension 6, having at its upper edge an inwardly extending flange 7 which is secured to the bottom plate 1 of the lamp. The lower portion 5 of the condensing chamber extends somewhat

downwardly and inwardly and its inner edge is turned down to form a vertical wall 8, within which is received and secured an annular ring 9. The inner globe 10 is seated against the ring 9 and is held in engagement with the same by a spring seat 11 of any usual construction, the balls for which are not shown in the drawing. The outer globe 12 is supported at the top by an annular ring 13 which may conveniently be hinged at 14 and secured in position by a suitable fastening means 15, the details of which are not here shown. The upper electrode 16 comprises two converging members 16^a and 16^b which are received within sleeves 17 and 18 within which the members 16^a and 16^b are adapted to slide freely. A lower electrode 19 coöperates with the upper electrode and it will be understood that suitable mechanism is provided in the lamp for separating the lower electrode from the upper to establish the arc, and if desired, for regulating the same. The rod or bar 20 is formed of some fusible material, the vapors from which are adapted to impart luminosity to the arc, and is so arranged that it is fed into abutting engagement with the upper electrode at such a point that the heat from the arc will fuse the tip of the bar 20. The bar 20 is guided by a sleeve 21, and I have here shown the same fed into abutting engagement with the upper electrode by gravity. It will be understood, however, that additional means may be provided for positively feeding this bar if desired. A casing 22 for the lamp surrounding the cylindrical extension 6 and supported by the upper portion 4 of the depositing chamber, houses the operating mechanism of the lamp. The casing may conveniently be formed in two portions which are fastened together at 23.

In operation the electrodes are separated to establish the arc. As soon as the tip of the upper electrode becomes sufficiently heated from the arc, the tip of the bar 20 which is in engagement with the upper electrode begins to fuse, and the material therefrom runs down over the arcing face of the upper electrode where the material, of which the bar 20 is composed, is vaporized and carried into the arc imparting luminosity to the same. Such an arrangement possesses the advantage that the amount of light giving material entering the arc is automatically

regulated. If, for instance, the tips of the electrodes become heated to an abnormal temperature, more of the fusible material will be melted and running over the tip of the upper electrode will cool the same, thereby decreasing the amount of material that will be fused. On the other hand, if the tip of the upper electrode is cooled to an abnormal temperature, less of the fusible material will be melted, thereby permitting the temperature of the tip of the positive electrode to increase.

It will be seen that my invention permits the use of electrodes for supporting the arc which are made of good conducting material, such as carbon, without burdening the electrode with light giving materials which are usually poor conductors and which interfere, when incorporated in the electrode itself, with the proper burning of the arc. When made of carbon the electrode may be made more dense than would be possible if the same were mixed with light giving materials, thereby increasing the life of the electrode. At the same time the labor involved in thoroughly mixing the light giving material with the carbon is avoided.

While I have mentioned carbon as a material well adapted for the electrode material in my invention, it will be understood that in case a still more slowly consuming material is desired, then metallic substances may be employed for supporting the arc. In such case the metallic substances of the electrodes themselves give luminosity to the arc, which luminosity may be enhanced and the color of the light may be modified by the use of my invention.

A bar or rod may be made, in accordance with my invention, by melting together equal parts of calcium fluorid, sodium fluorid and potassium fluorid, and casting the molten mixture into the form of a rod or bar, as desired. In case it is desired to further lower the melting point of the rod, the proportion of the alkaline materials may be increased. While I have mentioned fluorids as well suited for the purpose of my invention, it will be understood that it is not limited to any specific light giving materials, as other materials such as titanates and

oxids, or mixtures with or without the fluorids may be used.

It will be found in practice that the point at which the rod of fusible material abuts against one of the electrodes will depend upon the fusibility of the particular material employed. It is quite obvious, for example, that a rod of rather readily fusible material would be made to abut against the electrode at a point farther removed from the arc than would a rod of more refractory material.

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

1. In an arc lamp, a pair of cooperating electrodes between which an arc may be formed, in combination with a fusible rod containing or composed of light giving materials, abutting against one of the electrodes in such vicinity of the arc as to feed the fusing rod-material into the arc.

2. In an arc lamp, the combination of an upper and lower electrode between which an arc may be formed, and means for imparting luminosity to the arc, consisting of a fusible rod containing or composed of light giving materials and adapted to be held in abutting engagement with the upper electrode above the arc.

3. In an arc lamp, a pair of electrodes between which an arc may be formed and supported, one of said electrodes having its arcing face maintained substantially stationary with reference to the lamp, in combination with a rod of fusible light giving material held in abutting engagement with said electrode in such vicinity of the arc as to feed the rod-material into the arc.

4. In an arc lamp, an upper and a lower electrode, between which an arc may be formed and supported, the upper electrode comprising a pair of abutting members, and a bar of fusible light giving material held in abutting engagement with said abutting members in the vicinity of the arc.

In witness whereof, I have hereunto set my hand this 16th day of May, 1912.

JOHN T. H. DEMPSTER.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.