E. WEINTRAUB.

VAPOR ELECTRIC DEVICE.

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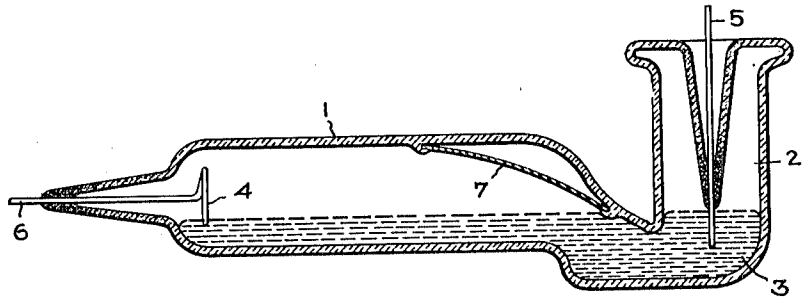
1,102,308.

Patented July 7, 1914.



WITNESSES:

Helen A. Ford

Benjamin B. Hull

INVENTOR:

EZECHIEL WEINTRAUB,

BY Albert G. Davis

HIS ATTORNEY.

UNITED STATES PATENT OFFICE.

EZECHIEL WEINTRAUB, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

VAPOR ELECTRIC DEVICE.

1,102,308. Specification of Letters Patent. Patented July 7, 1914.

Application filed February 21, 1914. Serial No. 820,319.

To all whom it may concern:

Be it known that I, EZECHIEL WEINTRAUB, 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 Vapor Electric Devices, of which the following is a specification.

The present invention relates to vapor electric devices, and particularly to arc devices of the high pressure type such as the high pressure vapor lamps in which an arc drawn from a mercury terminal is confined by a silica envelop.

It is the object of my invention to provide means for steadying the arc.

The high pressure, high temperature mercury arc does not fill out the entire space in the container like the diffuse low temperature arc, and unless special provision is made it wavers to and from in the container, thus producing a flickering light. The arc may be steadied by depressing the envelop wall above the cathode so that the arc impinges upon the envelop wall. This construction is satisfactory so long as the current or the energy input per unit length of the tube is not very great. The type of lamp with the solid anode, as described by me in my patent application Serial No. 753,946, is, however, capable of being so designed as to run on high currents, such as 6 to 8 amperes and more, a thing which it is difficult to accomplish with the old type of quartz mercury arc having two mercury electrodes.

The main part of the envelop can easily stand the temperature produced even by the high current arc, as there is no contact between the arc and the quartz. The depressed roof above the cathode which is struck by the cathode blast before the latter is deflected parallel to the envelop is, however, a limiting feature. At these high currents the heat of the arc is either sufficient to soften the quartz envelop at this region or at least to devitrify the quartz, eventually causing cracking, and thus ending the usefulness of the lamp.

In accordance with my invention, a vapor device of greater energy capacity and of greater efficiency as a light source may be produced by providing in the envelop above the cathode a refractory plate or baffle consisting of material not subject to devitrification upon which the arc will impinge so as to be depressed.

The accompanying drawing is a longitudinal sectional view of a mercury vapor device made in accordance with my invention.

The device in this case, a direct current mercury lamp, has a refractory envelop 1, consisting preferably of fused silica. The envelop is provided with a cathode chamber 2 containing a body of mercury 3. The anode 4 preferably consists of a refractory metal, such as tungsten or tantalum. Current connections are made to the cathode and anode by leading-in wires 5 and 6 which are sealed into a glass, such as a sodium-magnesium boro-silicate having substantially the same coefficient of expansion as tungsten and joined to the silica wall through a series of intermediate zones of glasses having progressively higher proportion of silica passing from the glass surrounding the wire to the silica wall. Just above the active surface of mercury from which the arc springs is a plate 7 consisting of refractory material not subject to devitrification, for example, a refractory metal such as tungsten or tantalum or a highly refractory oxid, such as thoria or zirconia. The width of this plate 7 approximates the diameter of the tube. It constitutes a baffle surface which depresses the arc out of the position which it would normally assume if the plate were absent, and thereby exerts a steadying action upon the arc so as to prevent its flickering.

While my invention has been described with particular reference to the high pressure mercury vapor lamp, I wish it to be understood that it is not limited in its application to devices in which the cathode material consists of mercury or to lamps, as distinguished from other arc devices.

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

1. In a vapor electric device, the combination of an envelop, an easily vaporizable cathode, an anode, and a refractory baffle located above the cathode.

2. In a high pressure mercury arc lamp, the combination of a refractory envelop, a mercury cathode, a solid anode and a refractory plate located above said cathode and inclined at an acute angle to a line joining the cathode and anode.

3. In a high pressure mercury vapor lamp, the combination of a quartz envelop, a mercury cathode, a solid anode, and means located above the cathode in close proximity thereto to intercept the cathode blast and steady the arc.

4. A high current, high pressure mercury vapor lamp comprising a mercury cathode, and a baffle of highly refractory, gas-free material located at such distance above the cathode that an arc springing from the cathode will be depressed out of its normal position.

In witness whereof, I have hereunto set my hand this eighteenth day of February, 1914.

EZECHIEL WEINTRAUB.

Witnesses:
JOHN A. McMANUS, Jr.,
HENRY A. ANDERSON.