Jan. 1, 1935. A. L. BRANDT, SR 1,986,462

ELECTRODE

Filed March 5, 1929

Fig. 1.

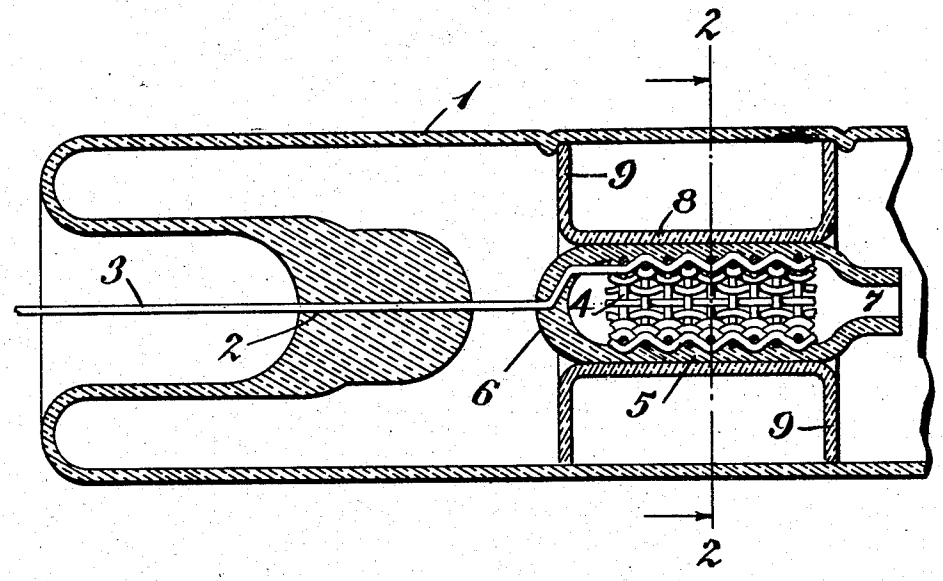
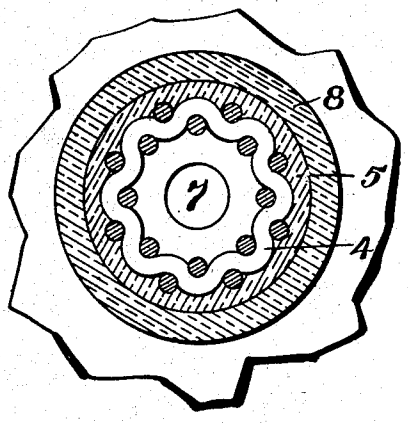


Fig. 2.



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ELECTRODE

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Application March 5, 1929, Serial No. 344,139

6 Claims. (Cl. 176—126)

This invention relates to improvements in the construction of electrodes for electroluminescent tubes. The improvements are disclosed but not claimed in a copending application serially numbered 320,150. The principal object of the invention is to provide an improved form of electrode construction by which the rate of vaporization is decreased.

According to the invention the active or metal element of the electrode is partially embedded in a dielectric and heat conductive substance such as glass, a portion of the surface of the metal element being exposed as an active area. I have discovered that the anchorage of the electrode in this manner while obviously decreasing the active area of the electrode, nevertheless effects a reduction in the rate of vaporization over what it otherwise would be under similar operating conditions if the area of the electrode were fully exposed to the gas.

The reason why this mode of construction should effect a reduction in the rate of vaporization is not, at this time, definitely known. It is, however, believed that the intimate contact provided between the metal element of the electrode and the substance in which it is anchored, facilitates the transfer of heat from the metal element to the substance while the latter provides a more conductive path for the flow of heat than has heretofore been provided. In other words, it would appear that this construction increases the rate at which the heat is removed from the metal element of the electrode to an extent such as to effect a decrease in the working temperature of such element.

The electrode being particularly intended for use in connection with electroluminescent tubes, is illustrated in the accompanying drawing as applied to such a tube. In said drawing:

Figure 1 is a longitudinal sectional view of the electrode construction showing its relation to the terminal portion of a tube.

Figure 2 is a section along line 2—2 of Figure 1.

The electroluminescent tube is sufficiently indicated by a showing of its terminal portion 1 in which the reentrant stem is provided with a glass seal 2 through which the lead-in wire 3 passes. The element 4 of the electrode to which the lead-in wire 3 is connected, may be composed of any suitable metal and fashioned in any suitable form.

The invention may be carried out by suitably anchoring or partially embedding the electrode 4 in a refractory and dielectric substance such as glass. While the electrode and the glass may be of any suitable shape. I preferably utilize a foraminated cylindrical electrode element and arrange it within a chamber provided by a cylindrical glass body 5. I prefer the use of a body 5 having one end closed as at 6 and its other end reduced to provide a restricted connecting passage 7 between the chamber and the tube proper. This construction while not essential to the present invention, is preferred because of the advantages attending its use, all of which are pointed out in the copending application noted. The metal electrode element 4 is anchored in the body 5 in any suitable manner. This may, for example, be accomplished by heating the septum so as to cause it to soften to the point where it flows into and fills the foramina of the metal element of the electrode, leaving a suitable area of the latter exposed as an active area.

The septum 5 may be supported directly from the reentrant stem 2 but preferably is supported by an axially disposed glass cylinder 8, the opposite ends of which are provided with annular supporting flanges 9 of a diameter substantially equal to the inside diameter of the tube 1.

It will, of course, be understood that the dielectric part in which the metal element of the electrode is embedded may have various forms and that it is generically a support for said element, the cylindrical septum shown being merely one of the forms in which such support may be provided.

Having fully described my invention, I claim:

1. An electroluminescent tube having an electrode comprising a dielectric support and an electrically conductive element, said element having a face which provides an active area and a back which is substantially coextensive with said face, said back being fused to and partially embedded in said support.

2. An electroluminescent tube having an electrode comprising a refractory dielectric support and an electrically conductive element, said element having a face which provides an active area and a back which is substantially coextensive with said face, said back being fused to and partially embedded in said support.

3. An electroluminescent tube having an electrode comprising a dielectric support and foraminous electrically conductive element, said element having a face which provides an active area and a back which is substantially coextensive with said face, said back being fused to and partially embedded in said support.

4. An electroluminescent tube having an electrode comprising a dielectric refractory support formed to provide a chamber and an electrically conductive element arranged within said chamber, said element being fused to and partially embedded in the walls delimiting said chamber.

5. An electroluminescent tube having an electrode comprising a dielectric refractory support formed to provide a chamber and a cylindrical electrically conductive element fused to and partially embedded in the walls delimiting said chamber.

6. An electroluminescent tube having an electrode comprising a dielectric refractory support formed to provide a chamber and a cylindrical foraminous electrically conductive element arranged within said chamber, said element being fused to and partially embedded in the walls delimiting said chamber.

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