

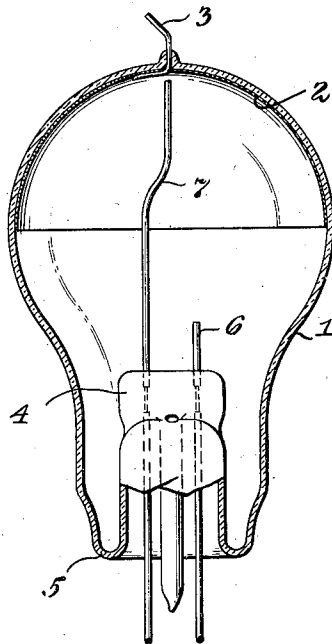
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GLOW DISCHARGE TUBE

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## GLOW DISCHARGE TUBE

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## 1 Claim. (Cl. 250—27.5)

The invention relates to glow discharge devices and especially to the cathode structure of such devices.

An object of the invention is to prevent premature decomposition of the cathode material.

Another object of the invention is to provide a good conductivity to the sensitive layer of the cathode.

Other objects and advantages of the invention will be apparent from the following description and drawing in which:

The figure is a view in cross-section of a preferred embodiment of the invention.

Difficulties have been experienced in the cathodes of glow discharge devices.

In the case of tubes in which the electron-emitting layer of the cathode is supported by a separate electrode, it is very difficult to carry out the process of joining by fusion the stem with press-portion provided for said electrode to the bulb-wall in such a manner that the electrode-temperature will remain below the temperature at which the alkali-metal or alkaline-earth-metal compounds in question will start to decompose. On the other hand, when the active layer is produced by the decomposition of azides on the vessel-wall proper, the cross-conductivity of the layer obtained in this manner will be low, so that the layer cannot be heavily loaded.

The present invention discloses that this disadvantage can be avoided by providing a metallized portion of the vessel-wall as a support for the active layer preferably consisting of an alkaline earth metal, such as barium, or of an alkali metal. When this procedure is followed, it becomes feasible, in the course of the process of joining by fusion the stem with press-portion provided for the other electrodes to the bulb-wall, to keep the temperature of the compound deposited on the metallized portion of this wall so low that the compound will not start to decompose. The supporting layer of metal underneath the active layer can be produced by a known process in such a manner that its cross-conductivity will be high. The new procedure has the additional advantage that the metal formed by the decomposition of the alkaline-earth-metal or alkali-metal compound, for instance, barium azide, will not subsequently react with the vessel-wall.

An example of application of the present invention is illustrated on the drawing. The upper, spherical portion of the glass bulb 1 is provided with a coating of silver 2 that may be produced either by condensation of the evaporated metal or by chemical methods. The lead-in wire 3 for this silver coating is mounted in the customary manner. It is advisable to see to it that the surface of the silver coating remains rough. The reentrant stem with press-portion 4 is provided in the customary manner and is joined at 5 to the bulb-wall by fusion. This stem supports the pin-shaped anode 6 and an ignition electrode 7 which reaches almost up to the cathode.

Before the stem with press-portion is joined to the bulb-wall by fusion, the silver coating 2 is covered with a suitable alkali-metal or alkaline-earth-metal compound, for instance, barium azide. Thereupon the parts 1 and 4 are joined together by fusion, and subsequently the tube is evacuated and baked. Already in the course of the latter stages of the manufacturing process, the temperature may be raised to such a height that the compound deposited on the silver coating will be decomposed and the active layer formed.

Finally, after being filled with an appropriate gas, such as, for instance, argon, the tube is sealed and separated from the exhaust pump. If an A. C. voltage not exceeding the firing potential is applied to the cathode 2 and the anode 6 of such a tube, the subsequent application of a suitably chosen voltage to the ignitron electrode 7 will initiate the discharge. The tube may be used, for instance, for amplifying weak impulses which, after being amplified, must perform certain switching operations. By virtue of the fact that the cathode can be effectively cooled, the tube can carry rather heavy loads without danger that its active layer will be damaged.

I claim:

A discharge device comprising a curved container having a re-entrant stem, a press portion on said stem, a cathode on the curved wall of said container, a lead-in for said cathode attached thereto directly opposite said stem, an anode, and an auxiliary electrode sealed through said stem, said auxiliary electrode extending in close proximity to said cathode where the said lead-in is attached thereto.

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