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GLOW-INDICATOR TUBE

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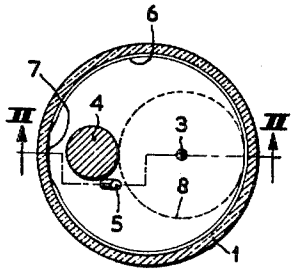


FIG.1

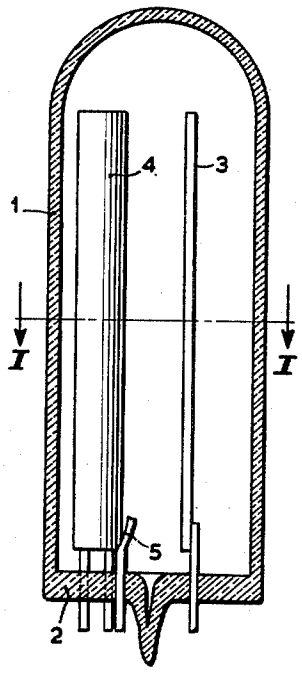


FIG.2

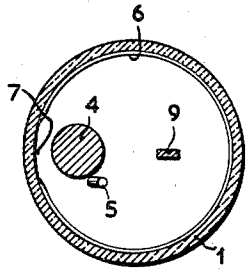


FIG.3

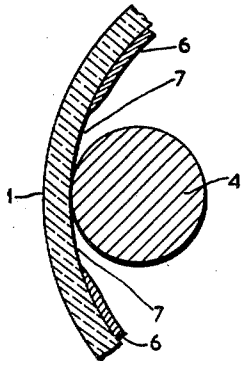


FIG.4

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GLOW-INDICATOR TUBE

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5 Claims. (Cl. 313—210)

This invention relates to glow-indicator tubes, the anode and cathode of which are wire or rods, extending parallel to the axis of a cylindrical tube, and the wall of which is provided with a layer of disintegrated cathode material. The disintegrated cathode material on the wall of the tube has for its purpose to confer constant properties on the tube.

To this end a visible layer is sufficient, in general but sometimes disintegration of the cathode is required to such a degree that the amount of light transmitted by the layer is too small for observing the cathode-glow. Further, the blackening of the wall increases during operation of the tube. At any rate, the intensity of the glow is appreciably lower than if the wall of the tube is bare.

The present invention has for its object to provide a tube in which a part of the wall is covered only with a thin layer of disintegrated material even after disintegration or operation for a long time, so that the glow remains perceptible.

In a glow-indicator tube, the anode and cathode of which consist of wires or rods extending parallel to the axis of a cylindrical tube, and in which the wall is for the major part provided with a layer of disintegrated cathode material, the anode and the cathode are, in accordance with the invention, so arranged with respect to one another and in connection with their size that only a part of the wall behind the anode, viewed from the cathode, is practically entirely free from disintegrated material, while the pressure is such that the glow viewed in the direction from the anode to the cathode, has a width exceeding that of the anode.

The anode is preferably a cylindrical rod having a thickness of 0.1 to 0.25 times the diameter of the tube, which rod is spaced less than half its diameter from the wall, the cathode then being a thin wire or a flat rod with one narrow side facing the anode. The anode rod preferably engages the wall of the tube, and the cathode is spaced as far far from the anode as is permissible in connection with the extension of the glow. The wall in the proximity of the anode remains practically free from disintegrated material. The greater spacing of the cathode from the anode results in reducing the wall coating in the proximity of the anode, and a flat cathode has the advantage that, during operation of the tube, the glow has a better form than in the case of a filamentary cathode.

In order that the invention may be readily carried into effect, examples will now be described in detail with reference to the accompanying drawing, in which

Figs. 1 and 2 are respectively a sectional view at right angles to and parallel to the axes of the tube according to the invention, and

Figs. 3 and 4 are sectional views at right angles to the axes of other embodiments.

In Figs. 1 and 2, the reference numeral 1 denotes the wall of the tube, through the bottom 2 of which an exhaust tube and a number of electrode lead in conductors pass. The tube contains a filamentary cathode 3, a stout anode rod 4 and a short auxiliary anode 5 all consisting of molybdenum. The auxiliary anode serves to fix the glow-discharge at a small current for making a given current strength correspond to a given limit of the glow. The layer of disintegrated cathode material on the wall is designated by 6 in Fig. 1. From this figure it is seen that a portion 7 is not or substantially not covered. The pressure in the tube is such that the glow extends in the zone indicated by broken lines 8. This glow is perceptible through the part 7 of the wall. In a given case, the diameter of the tube is 3.6 mms., the diameter of the anode 0.6 mm. and the spacing from the wall 0.3 mm. The cathode is 0.3 mm. thick, and the spacing from the wall and from the anode is 1.2 mms. The pressure of the gas, neon with 1% of argon is 20 mms.

Fig. 3 differs from Fig. 2 in that the cathode is a foil strip.

In Figure 4 the anode wire touches the glass wall. It may be seen that the coating 6 leaves free the parts 7 on both sides of the glass wall, through which the light of the cathode glow light may pass.

The layer 6 on the wall is obtained by passing a rather heavy current through the tube in the normal conduction direction for a certain time.

It is to be understood that the term "rod-like" whereever it appears in the claims shall mean having the shape of a flat or circular rod or a wire.

What is claimed is:

1. A glow-indicator tube comprising a substantially cylindrical envelope, rod-like anode and cathode electrodes extending substantially parallel to the axis of said envelope and to one another, a layer of disintegrated cathode material covering a portion of the inner wall of said envelope except for the part facing the anode on the side thereof remote from the cathode, and a gas filling in said envelope at a pressure at which a cathode glow is formed with potentials applied to said electrodes which viewed in the direction from the cathode to the anode has a width exceeding that of the anode.

2. A glow-indicator tube comprising a substantially cylindrical envelope, a cylindrical rod-like anode electrode having a thickness about 0.1 to 0.25 times the diameter of the envelope and having an axis extending substantially parallel to the axis of said envelope, said anode being spaced from the inner wall of said envelope by less than half the diameter of the anode, a flat rod-like cathode electrode having a narrower side facing and parallel to the anode electrode, a layer of disintegrated cathode material covering a portion of the inner wall of said envelope except for the part facing the anode on the side thereof remote from the cathode, and a gas filling in said envelope at a pressure at which a cathode glow is formed with potential applied to said electrodes which viewed in the direction from the cathode to the anode has a width exceeding that of the anode.

3. A glow-indicator tube comprising a substantially cylindrical envelope, a rod-like anode in contact with the inner wall of the envelope, a cathode electrode extending substantially parallel to the axis of the envelope and to the anode, a layer of disintegrated cathode material covering a portion of the inner wall of said envelope except for the part in proximity to the anode, and a gas filling in said envelope at a pressure at which a cathode glow is formed with potentials applied to said electrodes which viewed in the direction from the cathode to the anode has a width exceeding that of the anode.

4. A glow-indicator tube comprising a substantially cylindrical envelope, rod-like anode and cathode electrodes extending substantially parallel to the axis of said envelope and to one another, said electrodes being dis-

posed along a transverse axis of the envelope, said cathode being positioned a distance from the inner wall of said envelope which is less than half the diameter of said envelope, a layer of disintegrated cathode material covering a portion of the inner wall of said envelope except for the part facing the anode on the side thereof remote from the cathode, and a gas filling in said envelope at a pressure at which a cathode glow is formed with potentials applied to said electrodes which viewed in the direction from the cathode to the anode has a width exceeding that of the anode.

5. A glow-indicator tube comprising a substantially cylindrical envelope, rod-like anode and cathode electrodes of molybdenum extending substantially parallel to the axis of said envelope and to one another, an

auxiliary anode of molybdenum in proximity to said first anode electrode, a layer of disintegrated cathode material covering a portion of the inner wall of said envelope except for the part facing the anode on the side thereof remote from the cathode, and a neon gas filling containing 1% of argon in said envelope at a pressure at which a cathode glow is formed with potentials applied to said electrodes which viewed in the direction from the cathode to the anode has a width exceeding that of the anode.

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