

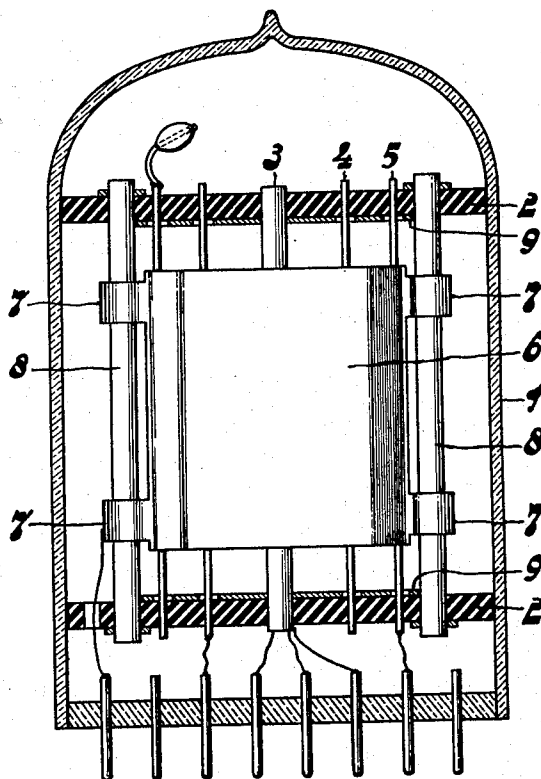
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ELECTRIC DISCHARGE TUBE

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ELECTRIC DISCHARGE TUBE

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2 Claims. (Cl. 313—261)

This invention relates to electric discharge tubes comprising an electrode system whose electrodes, inter alia a cathode, are accurately spaced apart by means of spacer members, at least one of the electrodes being secured in or to the spacer members by means of insulating supporting members. Such tubes are particularly suitable for operation with a high potential difference between the cathode and the electrode fastened to the insulating supporting members.

For operating voltages up to about 1500 volts between the different electrodes the latter are advantageously spaced apart by means of mica spacer members, mica having several advantages over other insulating materials employed for said purpose. Thus, for example, mica spacer members can be made very thin and its flexibility is favorable for proper clamping. Moreover, mica permits very accurate finishing, since it need not be fired like, for example, ceramic parts.

However, mica entails difficulties in the presence of considerable potential differences set up between the electrodes so that in this case it will often be necessary to use ceramic material or particular constructions. Thus, for example, the insulation path can be increased by securing electrodes in known manner to insulating supporting members connected to spacer members. A very suitable construction is obtained in an electric discharge tube comprising an electrode system whose electrodes, including a cathode, are spaced apart by means of spacer members and of which at least one of the electrodes is connected to said spacer members by means of insulating supporting members, if, in accordance with the invention, the spacer members consist of mica and the supporting members consist of different insulating material, whilst at least those sides of the mica spacer members, which face the electron space, are at least partly covered with a conductive coating. In this case the electrodes attaining a high voltage are consequently secured through ceramic members to or in the mica spacer members for centering the electrodes, so that the ceramic members do not effect the relative centering of the electrodes, thus avoiding difficulties involved by the use of ceramic spacer members whose dimensions are liable to considerable discrepancies owing to shrinkage caused by burning. It has however been found, that if the insulation path between electrodes having a high potential difference partly consists of ceramic material and partly of mica, difficulties may occur due to sparking and arcing over phenomena over the mica surface between the ceramic members and the remaining electrodes, notably over the surfaces of the mica members facing the electron space. For this reason such a combination could not be used without the need for further means.

The conductive layer may consist of an arbitrary metal or of a material being also advantageous in connection with other phenomena, for example low secondary emission such as of carbon, ferro-magnetic properties such as of iron, nickel, or the like.

Such a combination of mica and another insulating material, for example ceramic material, can be used with advantage only by covering moreover, in accordance with

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the invention, at least the surface of the mica spacer members facing the electrode space at least partly with a conductive layer, preferably consisting of metal, or by metallizing said surface. Although, consequently, the insulation path to the electrode having a high potential is substantially limited only to the ceramic material, much higher potential differences are permissible with impunity.

It is known per se to partly metallize mica spacer members in order to avoid surface charges and secondary emission, but without the combination of ceramic material and mica.

In order that the invention may be readily carried into effect it will now be described in greater detail with reference to the single figure shown in the accompanying drawing, given by way of example, which represents a discharge tube according thereto, and in which the tube comprises a bulb 1, mica spacer members 2, a cathode 3, grids 4 and 5 and an anode 6. The anode is secured by means of tags 7 to ceramic members 8 which in the present case are shaped as rods and fastened in the spacer members 2. It is found that if a high potential difference is set up between the anode 6 and the cathode 3, discharge phenomena may occur more particularly over the surface of the mica members 2 facing the electrode space. According to the invention, at least said surfaces of the members 2 are partly covered with a metal plate or a metal coat 9 which may be connected to the cathode. In spite of the fact that the insulation path between anode and cathode is limited to the ceramic rods 8 it has proved possible to set up higher potential differences between anode and cathode than in the absence of the metallization 9, whilst maintaining the advantages inherent in the use of mica spacer members for spacing the electrodes.

The invention is not limited to the aforesaid example. Alternatively, annular or differently shaped ceramic members may be used, and the mica members may, if desired, be metallized at both sides or furnished with a different conductive coat. The invention applies to all cases where the insulation path between electrodes, likely to have high potential differences, consist partly of mica and partly of different insulating material. The conductive coat may be connected to the cathode or to a different electrode.

What I claim is:

1. An electric discharge tube comprising an envelope, an electrode system including a cathode and at least one other electrode adapted to operate with a high potential difference therebetween disposed within said envelope, supporting and centering means for said electrode system within said envelope, said supporting and centering means comprising a mica spacer member, said cathode being secured to said mica member, a ceramic electrically-insulating supporting member secured to said mica member, said other electrode being secured to said ceramic supporting members, and a metal layer covering only partly the side of the mica member facing said other electrode and including a portion electrically connected to the cathode and located between the areas where the cathode and ceramic member are secured to the mica member, whereby the insulating path between said cathode and said other electrode between which the high potential is to be applied consists partly of metal-covered mica and partly of ceramic material.

2. An electric discharge tube as set forth in claim 1 wherein said other electrode is an anode electrode, and the metal layer contacts the ceramic member.

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