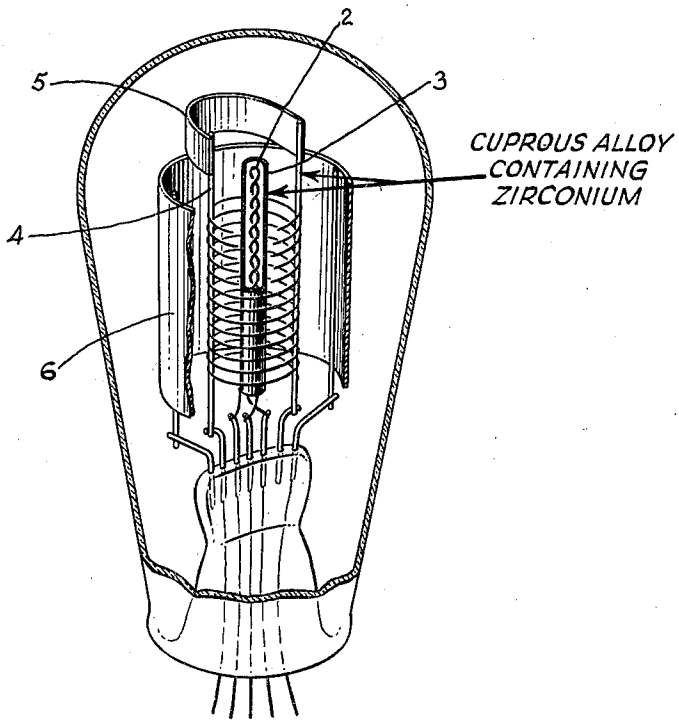
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ELECTRIC DISCHARGE TUBE

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ELECTRIC DISCHARGE TUBE

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4 Claims. (Cl. 250—27.5)

The present invention relates to an electric discharge tube, in which one of the electrodes or other parts at least partly consist of copper.

It is already known to use copper for the supply conductors of electric discharge tubes. Furthermore it has been proposed to make other parts such as the cathode body of indirectly heated cathodes, supporting rods of grids, cooling members or the like at least partly of copper. Copper has the great advantage, more particularly for the last-mentioned application, that the thermal emissivity of this material is comparatively small, whereas the thermal conduction is comparatively high: In many cases, however, the use of normal copper in discharge tubes involves phenomena which, according to experiments made by me, result in considerable quantities of gas often released by these copper members in the exhausted tube.

To avoid this drawback the electrodes or other parts of an electric discharge tube according to the present invention do not consist, at least partly, of normal copper, but the copper used for them has added to it a very small percentage of zirconium. The copper used for this purpose preferably contains about 0.1% to 0.3% of zirconium.

We have found that the quantity of gas set free by this material is materially smaller than that of normal copper and is of the order of magnitude of 10% thereof. Furthermore, it has turned out that the composition of the gas is also different from that of normal copper, since the material according to the present invention substantially contains hydrogen, whereas normal copper releases large quantities of carbon monoxide.

In the accompanying drawing there is shown merely for illustration an electron discharge tube having some electrodes which usually attain rather high temperatures during operation and which may be made of copper zirconium alloy of the invention. The tube shown in the drawing is conventional in structure and comprises an evacuated bulb enclosing an indirectly heated cathode consisting of a conventional heater **2** and a cathode sleeve **3** of the copper zirconium alloy of the invention, a conventional grid with side rods **4** and a cooling collar **5** of the same alloy, and an anode **6** which need not be made of the alloy unless it attains unusually high temperature during operation.

What I claim is:

1. An electric discharge device comprising an evacuated envelope containing an electrode which consists of an alloy of copper and zirconium containing a fraction of one per cent by weight of zirconium and the balance copper.

2. An electric discharge device comprising an evacuated envelope enclosing an electrode comprising a metal part which is heated during operation of the device and which consists of an alloy of copper and zirconium containing from 0.1% to 0.3% of zirconium and the balance copper.

3. An electric discharge device comprising an evacuated envelope enclosing a grid electrode having a cooling collar consisting of an alloy of copper and zirconium containing from 0.1% to 0.3% of zirconium and the balance copper.

4. An electric discharge device comprising an evacuated envelope enclosing an indirectly heated cathode structure comprising a heater and a cathode sleeve consisting of copper alloyed with from 0.1% to 0.3% of zirconium.

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