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STRUCTURAL COMPOSITION OF ANODES FOR ELECTROTHERMICALLY MODULABLE RADIATORS

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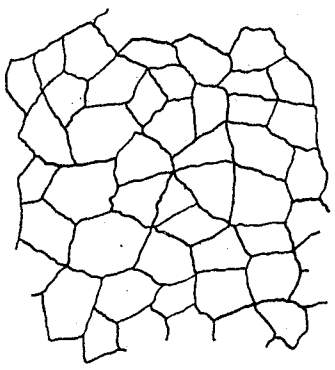


Fig. 1

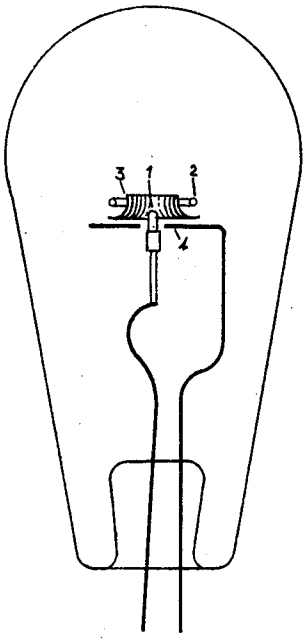


Fig. 2

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STRUCTURAL COMPOSITION OF ANODES FOR ELECTROTHERMICALLY MODULABLE RADIATORS

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10 Claims. (Cl. 176—1)

My invention relates to improvements in the structural composition of anodes for electrothermically modulable radiators and in the manfacturing of same, and the objects of my improvement are, first, to provide facilities for materially increasing the magnitude of the controllable stream of light; second, to afford thermic radiating means of relatively low thermic inertia and of very low thermic conductivity; and, third, to obtain a cellular structure comprising very thin layers.

Most known methods for producing modulated light, such as the Kerr-cell, the oscillograph-mirror, the light-sluice etc., possess the disadvantage that the size of the controllable stream of light is very limited. These controlling members, moreover, are relatively complicated and costly devices. It therefore is desirable, particularly for the purposes of light-telephony, to have thermic radiating means which possess such a low thermic inertia that they change their temperature, with a controllable output to the anode, up to frequencies of some thousands of Hertz. The desired low thermic inertia cannot be attained by means of ordinary tungsten filaments directly heated by the passing current. Radiating means in which an anode is heated through a bombardment of electrons are more favorable for this purpose, since in this case the outermost surface above all follows the variations of temperature. The anode naturally must consist of a material which possesses a very low thermic conductivity and thermic capacity.

According to the present invention the objective set forth above is attained by transforming an organic cellular structure either animal or vegetable, by way of chemical or, respectively, physical methods into an inorganic structure comprising elements or compositions difficult of fusion, i. e., with a melting point lying above 2000° C., and not easily vaporizable in a vacuum. The organic tissue, for this purpose, suitably is boiled over a certain length of time in a solution containing substances difficult of fusion or that part of the latter which is difficult of fusion, e. g., elder-pitch in a solution of sodium-tungstate. I then proceed to precipitate by means of a precipitant the substance difficult of fusion, e. g., in the form of an oxide. Upon slowly burning or charring the piece of tissue, the said oxide remains as skeleton and may be transformed into the pure element difficult of fusion or into a composition difficult of fusion by way of a reduction in a current of hydrogen or, again, by way of a carbonisation in a current of hydrocarbon. When suitably executing these processes the form of the original cellular structure remains intact.

I attain the objects set forth above by the structure and arrangement of parts illustrated in the accompanying drawing, in which—

Fig. 1 is a cross-section of a tungsten anode produced through the transformation of elder-pith, according to a micro-photograph magnified 250 times; and

Fig. 2 shows, by way of an example, schematically the composition of a radiator comprising an anode produced by way of the present invention.

In Fig. 2, 1 is the anode, 2 the heating filament, 3 the grid for controlling or adjusting the current of electrons, and 4 is the screen for concentrating the bombardment of electrons onto the tip of the anode.

What I claim and desire to secure by Letters Patent is:

1. In an electronic tube in which the anode is so heated by a controlled electronic bombardment that a modulated light is radiated, an anode characterized by a low heat inertia and having the internal geometrical structure of an organic cellular framework and composed of a high melting point material which is difficultly vaporizable in vacuum, said material being at most only in part present in the organic cellular framework.

2. In an electronic tube in which the anode is so heated by a controlled electronic bombardment that a modulated light is radiated, an anode comprising a cellular structure whose cell walls are constituted of a material of high melting point and low volatility in vacuum, said material being at most only partly composed of residues of an organic cellular structure.

3. In an electronic tube in which the anode is so heated by a controlled electronic bombardment that a modulated light is radiated, an anode comprising a cellular structure whose cell walls are constituted of a material of high melting point and low volatility in vacuum.

4. In an electronic tube in which the anode is so heated by a controlled electronic bombardment that a modulated light is radiated, an anode comprising a cellular structure whose cell walls are constituted of a material having a melting point above 2000° C. and characterized by being difficultly volatile in vacuum.

5. In an electronic tube in which the anode is so heated by a controlled electronic bombard-

ment that a modulated light is radiated, an anode comprising a cellular structure whose cell walls are constituted of a member of the group consisting of metals and their compounds having a melting point above 2000° C. and characterized by being difficultly volatile in vacuum.

6. In an electronic tube in which the anode is so heated by a controlled electronic bombardment that a modulated light is radiated, an anode comprising a cellular structure whose cell walls are constituted of a tungsten-containing material having a melting point above 2000° C. and characterized by being difficultly volatile in vacuum.

7. In an electronic tube in which the anode is so heated by a controlled electronic bombardment that a modulated light is radiated, an anode comprising a cellular structure whose cell walls are constituted of substantially pure tungsten.

8. An anode of low heat capacity and constructed for use in electronic tubes comprising a cellular structure having the appearance of the wall skeleton of an organic cellular material but having its wall constituted of a substance having a high melting point and difficultly vaporizable in vacuum.

9. The method of producing the anode material defined in claim 1, comprising introducing salts of substances melting above 2000 C. and difficultly vaporizable in vacuum into the cell walls of a cellular organic structure, and thereafter removing the original organic material by burning or other chemical process in such manner that an inorganic residue is left in the form of a thin-walled, cellular structure.

10. The method of producing an anode material comprising introducing a soluble tungstate into the cell walls of a cellular, organic structure, precipitating the tungstate in the form of the oxide, and subsequently destroying the organic substratum while retaining its cellular structure.

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