

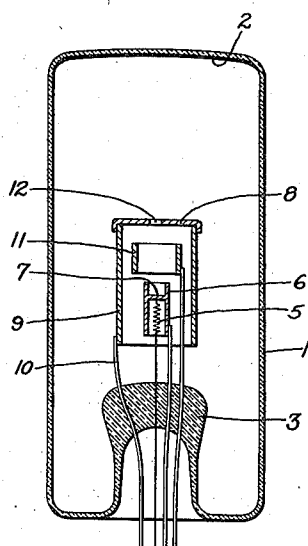
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ELECTRON TUBE

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ELECTRON TUBE

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1 Claim. (Cl. 250—27.5)

The present invention relates to electron tubes which are usually provided with a thermionic cathode, an anode and a fluorescent screen and which may be used as an oscillograph for the purpose of recording sound films or for other similar purposes. The anode may take various forms, for example, a plate provided with an electric discharge opening, or a cylindrical or conical tube mounted in an electron-receiving relation with respect to the cathode.

It has been found that in practically all of these prior electrode arrangements, the light rays given off by the cathode have a disturbing effect on the operation of the tube, particularly on the fluorescent screen which is subject to reflection phenomena. This effect is particularly noticeable when the cathode-ray tubes are used for sound film or television purposes. In addition to the presence of disturbing light rays, there are also stray or migratory electrons present within the tube which do not follow the linear path from the cathode to the anode but which strike the envelope or fluorescent screen and cause deleterious charging-up effects.

An object of the present invention is to provide an improved electrode structure in tubes of this sort which will avoid the objectionable light and electric effects referred to hereinbefore. In carrying out this object, the anode is made in the form of a metal cylinder which completely encloses the cathode. In the event that an electrostatic control member is used, the metal cylindrical anode may enclose this member as well as the cathode. The anode cylinder is preferably closed at one end except for a discharge opening and may if desired, be also closed at the other end. The invention will be better understood when reference is made to the following specification and the accompanying drawing which shows a sectional view taken along the longitudinal axis of the tube. In the drawing, numeral 1 designates a glass envelope which may be highly evacuated or if desired, may contain an inert gas at a suitable pressure. At one end of the envelope, on the interior thereof, there is a screen 2 of well-known form which fluoresces when struck by fast-moving electrons. The other end of the envelope terminates in a re-entrant stem 3 which supports the various electrodes.

The cathode may be directly or indirectly heated and in the drawing, there is shown by way of an example, a heater 5 contained within a cathode cylinder 6, preferably made of nickel, and secured to the cylinder by means of a trans-

verse metal member 7. The cup-shaped compartment formed by the upper end of the cylinder 6 and the disk 7 is preferably coated with electronically active material. The cathode structure is rigidly mounted from the stem 3 by means of leading-in conductors fused in the stem.

The anode is constituted in part of a metal disk 8 provided with a central aperture 12 for the electric discharge and mounted transversely of the envelope. In accordance with the present invention, the anode takes the form of a cap member 8 which is snugly fitted over a metal cylinder 9 of sufficient diameter and of such a length as completely to cover the cathode structure. This cylinder and cap which together constitute the anode is secured to the reentrant stem and is mounted in position by means of a rigid leading-in conductor 10.

In the event that an electrostatic control member is provided, either for converging or focusing electrons to a small spot on the fluorescent screen 2 or for controlling the position of the spot on the screen, such a member may take the form of a metal cylinder 11 mounted between the cathode and the cap 8, with the opening in the cylinder presented to the discharge opening 12 in the anode and to the electronically active compartment in the cathode structure. In other words, the cathode 7, control member 11 and the opening 12 are in rectilinear alignment along the main axis of the envelope 1. As in the case of the anode and cathode structures, the control member 11 is also mounted in position by means of a rigid leading-in conductor fused in the re-entrant stem 3. The cylinder 9 completely encloses the control member 11 in addition to the cathode structure.

It will be apparent that the metal cylinder 9 serves not only for the purpose of preventing light rays emitted by the cathode structure from reaching the fluorescent screen which would normally disturb the fluorescent effects but also shields the cathode and control member from extraneous electric fields which may deleteriously affect the position and intensity of the cathode-rays on their way to the screen.

It is apparent that while I have shown the cylinder 9 as being of circular configuration, the cylinder may take any other form desired, such as elliptical or rectangular. Furthermore, the cylinder may be closed at the bottom in order to increase its effect as a light and electrostatic shield, in which case, the bottom cover is pro-

vided with openings for the various leading-in conductors.

What I claim as new and desire to secure by Letters Patent of the United States, is:

- 5 A cathode-ray tube comprising an envelope coated on the interior with a fluorescent material and containing an indirectly heated cath-

ode, an anode and an electron-focusing member, said anode constituting a metallic cylinder closed at the end nearer said coating except for an electron discharge opening and surrounding the cathode and the focusing member throughout 5 their entire lengths.

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