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CATHODE-RAY TUBE

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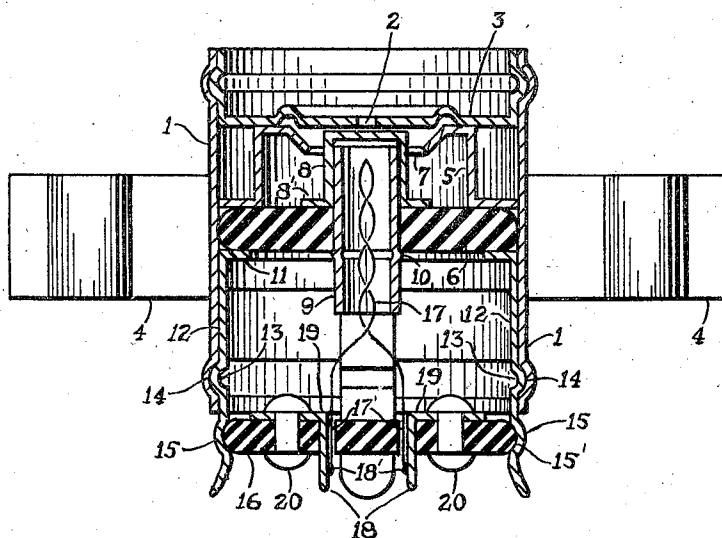


FIG. 1

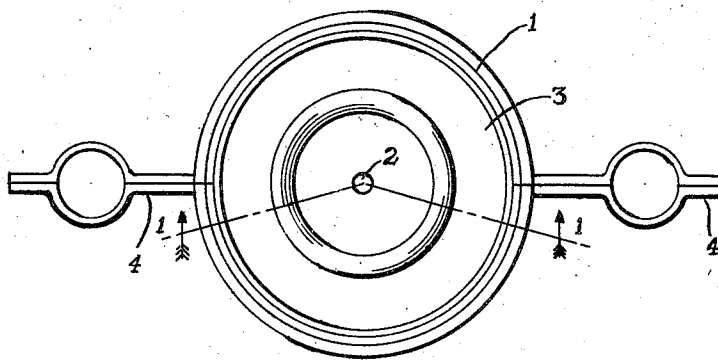


FIG. 2

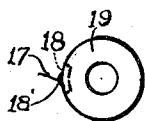


FIG. 3

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CATHODE-RAY TUBE

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2 Claims. (Cl. 250-162)

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This invention relates to a heater assembly that is particularly useful for cathode-ray tubes.

In carrying out the invention a rugged heater assembly is produced in such a way that the necessity of handling and welding the delicate heater wire in assembling the parts is obviated. When the parts are assembled the emission of light and electrons from the bottom of the control grid of the tube is prevented.

After the parts have been assembled the heater can be readily tested for continuity. The extent to which the heater is to be inserted into the cathode of the tube can be regulated so that the cathode temperature can be raised to the desired point or accurately controlled. Also, the length of the cathode-ray tube can be decreased.

The invention may be understood from the description in connection with the accompanying drawing, in which:

Fig. 1 is a longitudinal section along the line 1-1 of Fig. 2 through an illustrative embodiment of the invention;

Fig. 2 is a top view of the same; and

Fig. 3 is a plan view of a detail.

In the drawing, reference character 1 indicates the grid of a cathode-ray tube having a central aperture 2 in its end 3 for passage of a beam or ray of electrons.

Supporting extensions 4 are provided on opposite sides of the grid so that the grid can be supported on diametrically opposite ceramic rods, not shown, that are provided for the tube. A cup shaped spacer 5 is located between the end 3 and a disc 6 of insulating material that is located in the grid 1. A circular opening 7 is provided in the spacer 5. The disc 6 of insulating material is anchored in the grid 1 and is adapted to support the cathode 8 and a metal tube 9 that is tightly fitted in this cathode. The cathode 8 has a flange 8' bearing against the disc 6, and the tube 9 has an expanded ring 10 in contact with the lower side of the disc 6 so that the cathode 8 is fixed in position with respect to the aperture 2.

A metal ring 11 fits against the lower side of the disc 6. It is provided with a plurality of integral axially extending spaced fingers or arms 12 that lie in contact with the inside surface of the grid 1. Outward transverse bends 13 are provided in the lower part of the arms 12. These bends fit in a corresponding groove 14 at the lower end of the grid 1 to anchor the ring 11 in the grid 1.

These fingers 12 are provided with larger bends 15 below the bends 13 for anchoring a disc 16 of rigid insulating material in place.

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A coiled insulated heater 17 made of wire extends into the tube 9. This heater 17 has its end portions or legs attached to metal terminal lugs 18 that extend through holes 17' in the disc 16. The lugs 18 have extensions 19 lying along the upper side of the disc 16. The legs of the heater 17 extend through the same holes 17' as the lugs 18 and are spot welded to these lugs, as indicated at 18', and are supported thereby. The extensions 19 are securely fixed in place by eye-lets 20 extending through the disc 16.

The parts can be quickly and easily assembled by first placing the spacer 5 in the grid 1 with its smaller end in contact with the end 3. The disc of insulating material 6, to which the tubes 8 and 9 are securely attached, is then inserted in the grid 1 so that the disc 6 bears against the lower end of the spacer 5. The disc 6 carrying the cathode 8 is then put in the grid 1 with the upper surface of the disc 6 contacting with the lower rim of the spacer 5. The ring 11 is then inserted until it bears against the insulating disc 6 with its arms 12 in contact with the inside of the grid 1.

The disc 16 carrying the heater 17, adjusted so as to be automatically located in the proper position in the cathode 9, is pushed inwardly between the spring fingers 15 until it snaps into place in the grooves 15' of these fingers, thus automatically locating the heater in the proper position within the cathode 9, and locking the entire heater, cathode and grid structure together very securely.

The parts can be disassembled by a reverse procedure, first prying the disc 16 out of the grooves 15' after which the other parts can easily be taken out of the grid 1.

What is claimed is:

1. A heater assembly for a cathode-ray tube, which comprises a metal cylinder having annular grooves on the inside thereof near opposite ends thereof, a flanged disc located in said cylinder, the flange of said disc having a curved annular portion fitting in one of said grooves, an annular spacer in contact with said disc, a disc of insulating material in said cylinder in contact with said spacer, a cathode supported by said disc of insulating material, a metal ring having a flanged end in contact with said disc of insulating material, said ring having an annular bend extending into another one of said grooves, said ring having spring fingers that extend beyond the end of said cylinder and having bends therein, a disc of insulating material held in place by the bends in said fingers, and a heater for said cathode sup-

ported by said last named disc of insulated material.

2. The heater assembly of claim 1 in which terminal lugs for said heater are anchored to said last named disc of insulating material.

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