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N. H. GREEN

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ELECTRODE ASSEMBLY

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Fig. 1

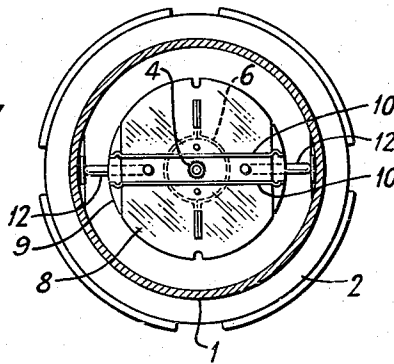


Fig. 2

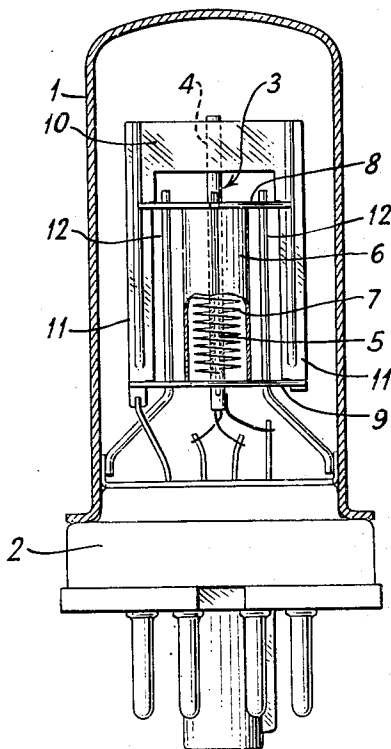
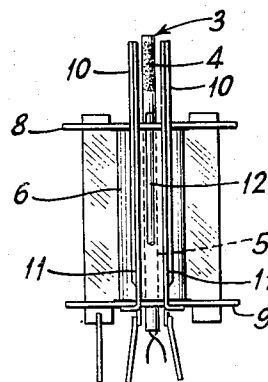


Fig. 3



INVENTOR.
NORVAL H. GREEN

BY

Charles McVair
ATTORNEY.

UNITED STATES PATENT OFFICE

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ELECTRODE ASSEMBLY

Norval H. Green, Wood-Ridge, N. J., assignor to
Radio Corporation of America, a corporation of
Delaware

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3 Claims. (Cl. 250—27.5)

My invention relates to electron discharge devices, particularly to unitary electrode assemblies for such devices.

It is often desirable to use one cathode for two or more electrode assemblies in one envelope. Coaxial electrode assemblies have been placed around a straight cathode sleeve, the electrodes of the assemblies being spaced longitudinally along the sleeve and opposite different emitting sections of the cathode. Such duplex mounts, however, are intricate and often contain large numbers of small parts that are difficult to assemble.

It is an object of my invention to make a radio tube comprising one cathode with two emitting sections and two electrode assemblies about each section.

The characteristic features of my invention are defined in the appended claims and one embodiment is shown in the accompanying drawing and described in the following specification in which Figure 1 is an end view of my electrode assembly, and Figures 2 and 3 are elevational views of the structure of Figure 1.

The particular electron discharge device shown in the drawing for illustrating my invention comprises a metal envelope 1 closed at its lower end with a non-reentrant or button type stem 2 into which is sealed the lead-in conductor for the electrodes. Within the envelope is a tubular cathode 3 with two spaced emitting sections 4 and 5 and around the lower emitting section is mounted an anode 6 and a grid 7. The anode and grid are supported at their ends in spaced, parallel insulating spacers 8 and 9, preferably of mica, and the cathode sleeve is passed through registering holes in the two insulating spacers with the upper end, carrying emitting section 4, extending above the upper spacer. The two emitting sections of the sleeve are activated preferably by a coating of the usual active metal oxides. The lower emitting section of the cathode in combination with the grid and anode functions in the usual way as a triode. Additional grids, such as screen grids and suppressor grids, may of course be placed around the control grid, and the cathode, if desired, may be of the filamentary type tautened with a spring on a support rod.

Two diode plates 10 are mounted on opposite sides of emitting section 4 of the extended end of the cathode. These diode plates each comprises a flat sheet of metal pressed out of thin metal stock, such as nickel, with integral downwardly extending co-planar legs or arms 11.

Each anode is substantially U-shaped in plan with the transverse portion of the U somewhat wider than the legs of the U. Each anode and its legs are flat and lie in one plane, except for ribs that may be pressed in the legs for stiffening. Transverse stiffening ribs may, if desired, be pressed in the plates 10. The inner edge of each leg engages a slot in the rim of the upper spacer to position the anodes and to space them the desired distance from the cathode, and the lower end of each leg is passed through the lower spacer and bent over to hold the flat plate in place.

The entire electrode assembly is supported on two support rods 12 that are joined at their lower ends to tabs on the header and are passed upward through each of the two spacers. Preferably the support rods are placed between the barrel of the lower anode 6 and the legs 11 of the upper anodes. Since these support rods are connected to the shell and are grounded they effectively reduce electrostatic coupling between the lower and upper anodes. If the electrode assembly is mounted in a glass envelope, the support rods should be attached to a grounding lead-in conductor.

In manufacture the ends of the anode 6 and grid 7 are pressed into their openings in the spacers and the cathode sleeve is lowered into place through the upper mica, the hole in the upper mica preferably being made oversize to prevent scraping of the oxide coating. Alignment and centering of the sleeve in the upper opening is then effected by three beads in the sides of the sleeve. The two flat anodes are then added by slipping their arms downwardly through the slots in the edges of the upper mica and the ends passed through the lower mica and clinched. Shoulders on the inner edges of the arms, bearing against the upper side of the top spacer, cooperate with the clinched lower ends of the arms against the bottom of the lower spacer to lock the electrodes in a strong unitary assembly. This assembly may then be lowered on to the two support rods 12 and the lead-in connections completed. The diode plates are firmly held in place, and because their two arms are held at two spaced points, the diode anode-to-cathode spacing remains fixed.

My improved electrode assembly is easy to manufacture, is rugged in construction and has minimum electrostatic coupling between the anodes.

I claim:

1. An electron discharge device comprising

spaced insulating spacers, a cathode sleeve supported at one end in one of said spacers and extending through a hole in the other spacer, said other spacer engaging said cathode sleeve intermediate its ends, an anode in cooperative relation with the extended end of said sleeve, said anode comprising a sheet of metal with two co-planar integral rigid parallel straight arms, the inner edges of each of said arms engaging the edges of each of said spacers to hold said anode in fixed spaced relation with said cathode.

2. In combination an anode comprising a sheet of metal, two parallel co-planar sheet metal arms integral with one edge of said sheet, parallel spaced insulating spacers engaging the opposed inner edges of said arms, one spacer being adjacent the outer ends of said arms, the end of one of said arms being secured to said one spacer to prevent lengthwise movement of the arms, a rigid cathode supported by said

spacers, an emitting section of said cathode being opposite and in cooperative relation with said sheet.

3. An electron discharge device comprising an envelope, a stem closing one end of the envelope, two spaced insulating spacers, a cathode extending through and supported by said spacers, said cathode having two emitting sections, one section being between the spacers and another emitting section beyond one of the spacers, a tubular anode surrounding the first mentioned section and a planar anode opposite the second mentioned section, said planar anode having two parallel integral rigid arms fixed to said spacers, support rods for said assembly between said tubular anode and said arms and engaging the spacers, said support rods being fixed at their lower ends to said stem and electrically grounded.

NORVAL H. GREEN.