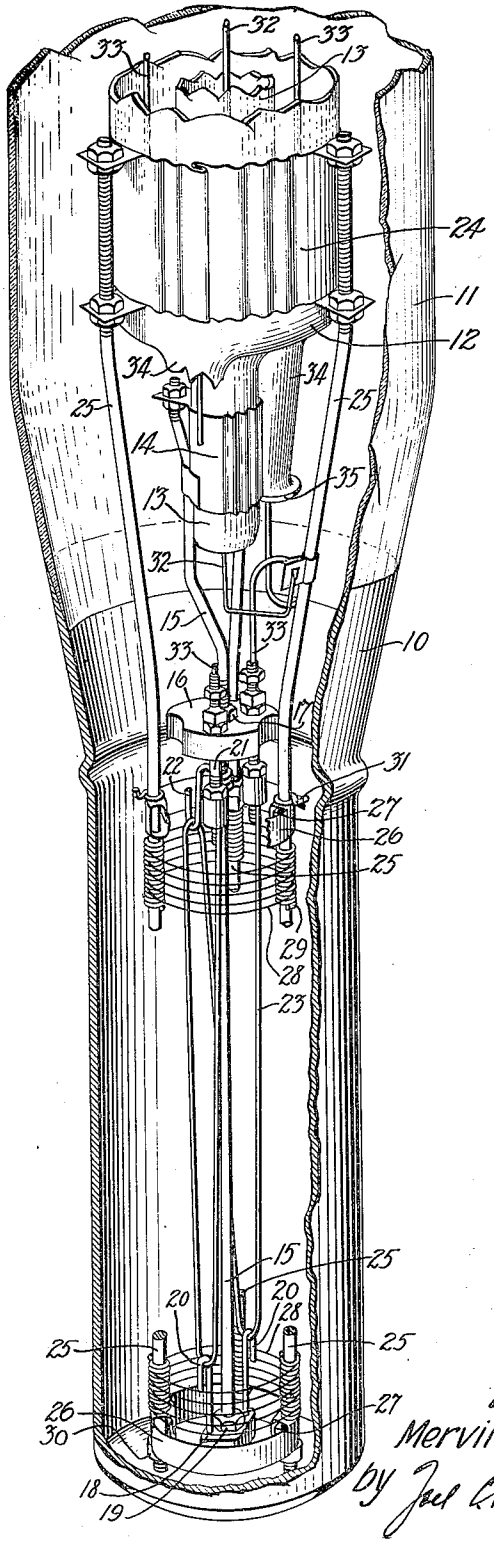
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M. J. KELLY

ELECTRON DISCHARGE DEVICE

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UNITED STATES PATENT OFFICE.

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ELECTRON-DISCHARGE DEVICE.

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This invention relates to electron discharge devices and more specially to devices of this character capable of handling large amounts of power and has for its object to improve the supporting structure for the electrodes.

To accomplish this object the grid electrode is supported directly from a collar surrounding the stem of an electron discharge device on rods attached to the collar, and a tubular member is arranged at the end of the stem and has attached thereto a supporting structure for the cathode.

The anode preferably surrounds the grid and forms a portion of the containing vessel. Each of the supporting structures for the grid and cathode are separate and distinct units and for that reason may be easily assembled and provide a simple arrangement.

Referring now to the drawings, the figure is a sectional view of a vacuum tube constructed in accordance with this invention.

The enclosing vessel of the device comprises the metallic portion 10 which serves as the anode to which is sealed a glass portion 11 having a reentrant stem 12. A tubular glass member 13 extends coaxial to the stem 12 and has its inner end projecting a short distance beyond the end of the stem and its outer end projecting beyond the end of the glass portion 11. A collar 14 surrounds the inner end of the tubular member 13 and is held in place by frictional contact therewith. A rod 15 is carried by the collar and extends approximately to the end of the anode 10. An insulating member 16 is carried by the rod 15 at a point slightly beyond the inner end of the tubular member 13 and is held in place on the rod by means of nuts 17 at either side thereof. At the extreme end of the rod there is mounted a second insulating member 18 which is also held in place by means of nuts 19. Preferably, after these nuts have been tightened they are welded to the rod 15 so that it is impossible for them to work loose. Carried by the insulating member 18 are a pair of hooks 20 which project toward the insulating member 16. Carried by the insulating member 16 are a pair of rods 21, the ends of which project from either side of the insulating member. Just beyond the insulating member 16 is arranged a hook 22 projecting toward the insulating member 18 the shank of which is wound around the rod 15 and welded thereto. The filament 23 is strung between the elements 20, 21 and 22, each end of the filament being attached to one of the rods 21 by means of a nut which is welded to the rod. The electrical connection between the filament and the rod 15 prevents the latter from collecting an electrical charge.

A collar 24 surrounds the stem 12 and is held in place by frictional contact therewith. A plurality of rods 25 are supported from this collar and projecting nearly to the end of the anode 10. At the ends of these rods 25 is an annular band 26 having inwardly projecting ears 27 through which extend the ends of the rods 25. At a point approximately half way between the ends of the rods 25 is a second band 26 having ears 27 through which project the rods 25. Surrounding the rods 25 between the bands 26 is a helically wound wire 28 the turns of which are spaced from each other and supported by means of a wire helix 29 or other equivalent means supported by the rods 25. The bands 26 engage the opposite ends of the members 29 and position them on the rods 25. The band 26 is prevented from movement toward the end of the anode by the butts 30 and the second band 26 is prevented from moving toward the stem by wires 31 wrapped around the rods 25 and welded thereto.

The lead wire 32 for the grid is attached to one of the rods 25 and projects out through the tubular member 13 and is sealed in the extreme end thereof. The lead wires 33 for the cathode pass up through tubular members 34 projecting from the stem and are sealed into the ends thereof by means of the copper disc seal 35, the inner ends of the lead wires being attached to the ends of the rods 21 extending toward the stem by means of nuts which are welded to rods 21.

What is claimed is:

1. An electron discharge device comprising an enclosing vessel having a stem, a collar surrounding said stem, an electrode supported from said collar, a tubular member projecting from said stem, a collar surrounding said tubular member, an electrode supported from said collar and a leading-in wire for said last named electrode passing through and being sealed in one end of said tubular member.

2. An electron discharge device comprising an enclosing vessel having a stem, a tubular member projecting from said stem, a collar surrounding said tubular member, a metallic rod supported from said collar, a plurality of insulating members carried by said rod, filament supporting members carried by said insulating members, a filament supporting member carried by said rod, a filament supported by said supporting members a collar surrounding said stem, a plurality of rods carried by said collar, a wire helix surrounding said rods, means carried by said rods for supporting said helix and spacing the turns thereof, and means for maintaining said separate means in position.

3. An electron discharge device comprising a vessel having a stem, a tubular member projecting therefrom, a collar surrounding said tubular member, an electrode supported from said collar, a leading-in wire in said tubular member for said electrode, a collar surrounding said stem, and an electrode supported from said collar, said two electrodes being coaxial.

In witness whereof, I hereunto subscribe my name this 10 day of April A. D., 1923.

MERVIN J. KELLY.