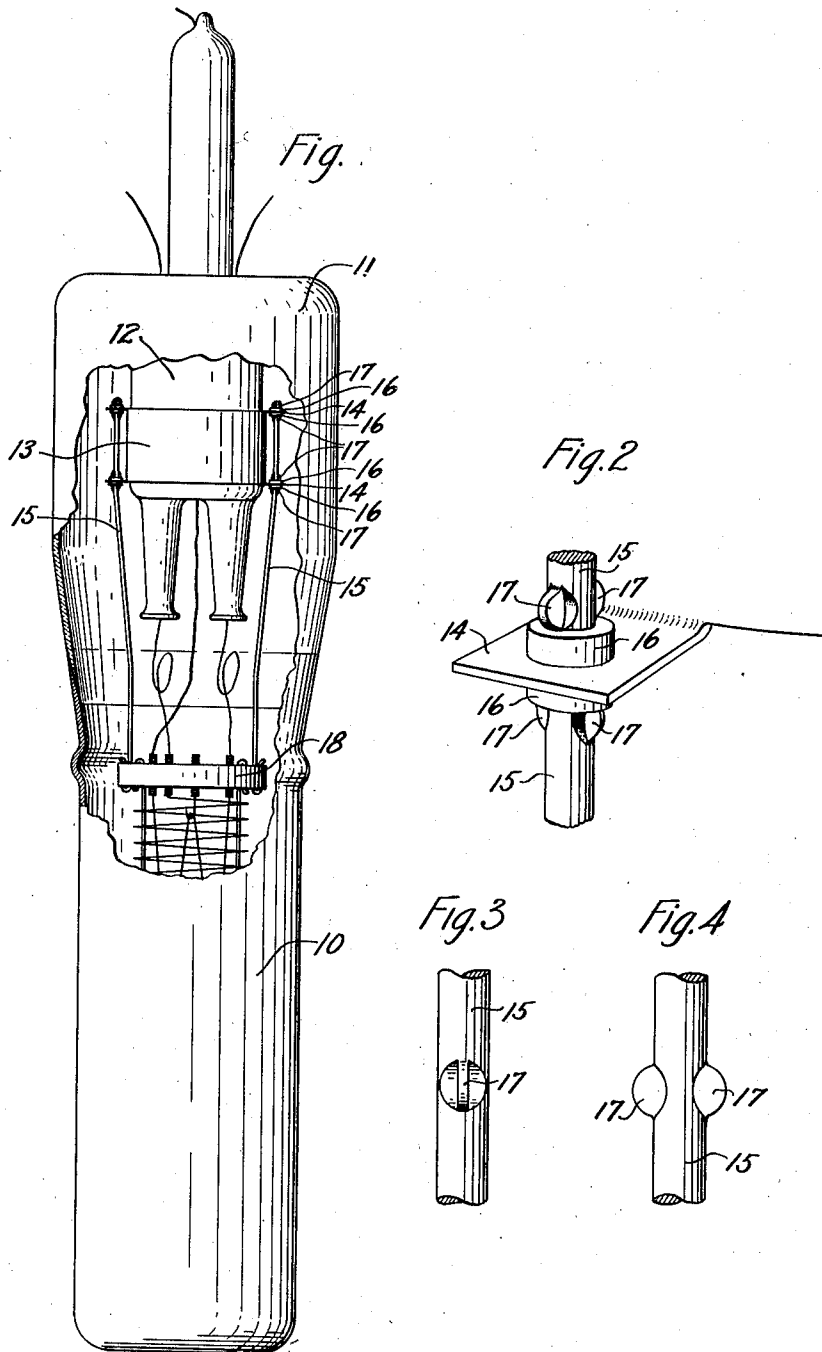


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F. E. WARD
ELECTRON DISCHARGE DEVICE

Filed June 4, 1923



Inventor:
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by J. C. Palmer Atty

UNITED STATES PATENT OFFICE.

FRANK E. WARD, OF CORONA, NEW YORK, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ELECTRON-DISCHARGE DEVICE.

Application filed June 4, 1923. Serial No. 643,234.

To all whom it may concern:

Be it known that I, FRANK E. WARD, a citizen of the United States, residing at Corona, in the county of Queens, State of New York, have invented certain new and useful Improvements in Electron-Discharge Devices, of which the following is a full, clear, concise, and exact description.

This invention relates to electron discharge devices and pertains especially to vacuum tubes capable of handling large amounts of power.

The object of this invention is to simplify the supporting structure for the electrodes of devices of this character.

In devices of this type, metallic rods are positioned in perforated tabs of a collar and serve as supports for the electrode assembly. This invention contemplates a supporting structure in which the metallic rods are attached to the tabs by expansions formed on the rods. This arrangement provides an easily assembled and rigid structure for the support of the electrodes.

Referring to the drawings, Fig. 1 is an elevation, partially broken away, of an electron discharge device embodying this invention; Fig. 2 is an enlarged detail of the supporting assembly; Figs. 3 and 4 are enlarged details of the metallic rod.

The enclosing vessel of an electron discharge device comprises a cup-shaped metallic anode 10, a glass portion 11, and a re-entrant stem 12. Surrounding the stem 12 is a metallic collar 13, which is supported on the stem 12 wholly by a friction. Projecting from the upper and lower ends of the collar 13 are tabs 14. These tabs are arranged at right angles to the collar 13 and are perforated, the perforation of the upper tab being in alignment with the perforation in the lower tab. Metallic rods 15, extend through the perforations in the tabs 14, the free ends of the metallic rods being attached to the insulating member 18, which serves as a support for the grid and cathode. Arranged on the metallic rods 15 are metal washers 16, disposed on opposite sides of the perforated tabs 14. Ears 17 are expanded from the metallic rods 15, adjacent the outer ends of spacing washers 16, alternate pairs of expanded portions or ears being in staggered relation to each other. The expanded portions of the metallic rod provide a wedging action against the sleeve members 16,

thereby clamping the metallic rods 15 to the collar 13.

By the use of this invention, a highly efficient and inexpensive supporting structure is provided, which eliminates vibration and loose connections. Although the invention is illustrated as attaching the metallic rods to the collar, it may, with equal effect, be employed to attach the rods to other means of support without departing from the scope of the invention as represented by the appended claims.

What is claimed is:

1. In an electron discharge device, a supporting means, a metallic member carried by said supporting means, and washers on said member positioned on opposite sides of said supporting means, said member having integral ears formed thereon in contact with said washers.

2. In an electron discharge device a support for electrodes, comprising a collar, supporting means on said collar, a metallic rod inserted in said supporting means, and washers on said metallic rod, portions of said rod being enlarged in width and cooperating with said washers to prevent movement of said metallic rod in said supporting means.

3. In an electron discharge device, a collar, projections on said collar, a metallic member extending through a plurality of said projections, spacing means on said metallic member on opposite sides of said projections, and integral wedge-shaped portions on said metallic member, said wedge-shaped portions serving to clamp the spacing means on opposite sides of said projections to attach said metallic member to said collar.

4. In an electron discharge device, an evacuated vessel, a stem, a collar encircling said stem, a plurality of perforated projections on said collar, a metallic rod inserted in said perforated projections, and washers on said metallic rod positioned on opposite sides of said perforated projections, said metallic rod having integral expanded portions contiguous with said washers to support said metallic rod from said collar.

5. In an electron discharge device, an evacuated vessel, a stem, a collar encircling said stem, a plurality of perforated projections on said collar, a metallic rod inserted in said perforated projections, and washers

on said metallic rod positioned on opposite sides of said perforated projections, said metallic rod having integral ears contiguous with said washers, adjacent ears being
 5 in staggered relation to each other.

6. An electron discharge device, comprising an evacuated vessel, a stem, a collar encircling said stem, a plurality of perforated projections on said collar, a metallic member extending through said projections, and

spacing means on said metallic member arranged on opposite sides of said projections, said metallic member being expanded adjacent the outer ends of said spacing means to attach said metallic member to said collar.

In witness whereof, I hereunto subscribe my name this 29th day of May A. D., 1923.

FRANK E. WARD.