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ELECTRON DISCHARGE DEVICE
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Fig. 1

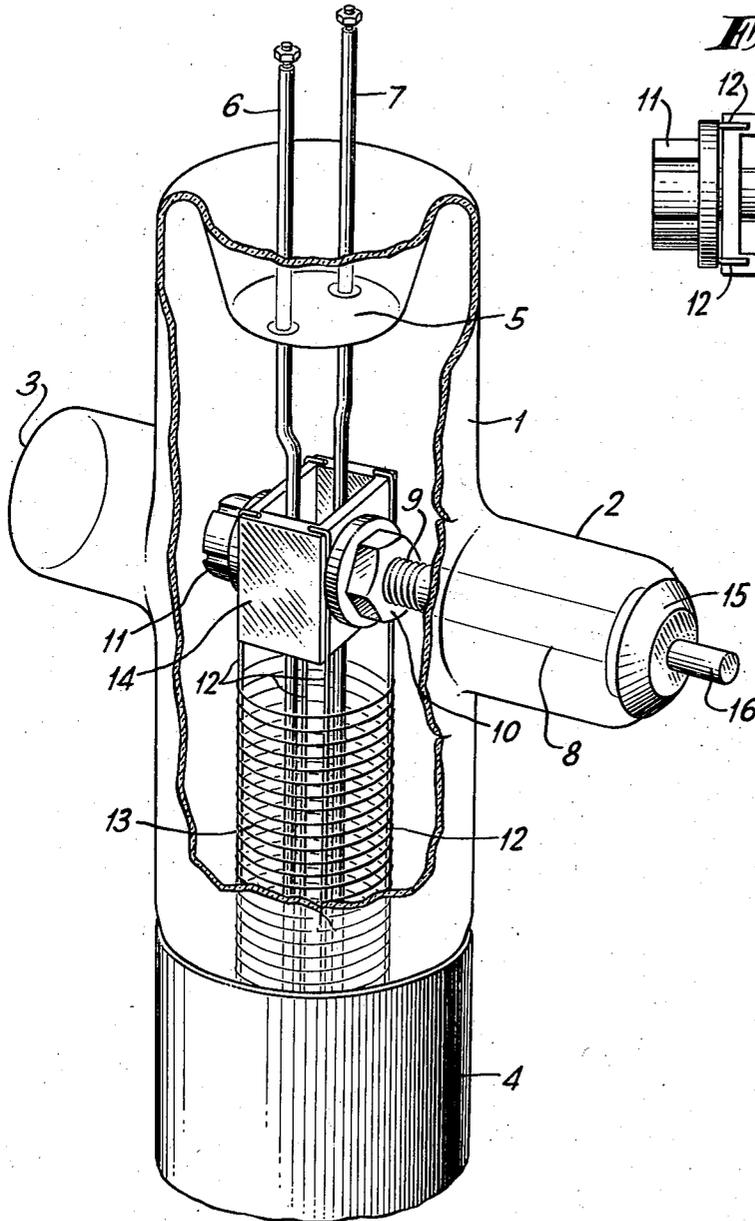
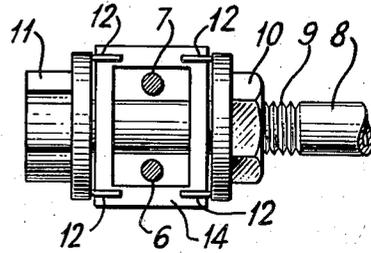


Fig. 2



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ELECTRON DISCHARGE DEVICE

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2 Claims. (Cl. 250—27.5)

This invention relates to electric discharge tubes for generating and amplifying electric oscillations, particularly transmitting tubes in which the grid is carried by a supporting member sealed in a side wall of the tube.

To support grid electrodes, it has previously been suggested by the applicant to secure a grid by means of two supporting members or rods in opposite sides of the wall of the tube, it being necessary, in view of the difference in expansion between metal and glass, that the supporting members be more or less resilient since otherwise there is risk of fracturing the seals. It was consequently necessary to support the grid at its other end and to center it for example by means of a centering disc bearing on the anode wall. This, however, increases leakage currents between the anode and the grid.

According to the invention, in a discharge tube for generating and amplifying electric oscillations, the grid is secured in a manner which ensures permanent and accurate centering.

The grid supporting member of this invention is preferably hollow so as to ensure a saving in weight.

The supporting wires, such as side rods, of the grid may be held against a support block by means of lock nuts, or they may be welded thereto. In the first case, the body is provided with shallow grooves so as to prevent the side rods from being displaced sidewise. The side rods are preferably slightly thicker than the depth of the groove so that the rods may be rigidly clamped in the grooves by the nuts on both sides of the block.

The nuts permit the grid to be adjusted accurately in the axis of the anode. Since further supporting means of the grid may be dispensed with, small insulating paths and leakage currents are avoided. Locking of the nuts is also very simple since the latter can be tightened rigidly and may be milled.

The supporting block is preferably hollow so as to permit the filament supply wires to be insulatingly passed through the block.

This improved construction is particularly adapted to triodes but may also be used in the tubes with a plurality of grids, it being possible for the grids to be secured to support means in various side tubules in opposite ends of the envelope.

It is known in the art to secure the supporting wires or side rods of the grid to a ring and to hold this ring in a support normal to the tube axis, the ring being suspended in the aperture of a part of

the support enlarged in the shape of a plate and being clamped in position by means of an annular nut. Apart from the fact that locking of the nut may entail difficulty it is not possible for the grid to be displaced in a direction normal to the tube axis to accurately center the grid.

In order that the invention may be clearly understood and readily carried into effect it will now be described more fully with reference to the accompanying drawing, in which

Figure 1 shows the glass upper part of a tube of high power in which the grid is secured in position in accordance with the invention, and

Figure 2 is a detail view of the improved grid support.

The tube envelope comprises a glass end section or part 1 which has formed in it two side extensions or tubules 2 and 3 and in the present case is coaxial with and sealed to the end of anode 4. The upper end of the glass section is closed by a reentrant stem and press 5 having sealed in it the current supply leads 6 and 7 of the cathode.

One of the side extensions has secured in it a shaft or rod 8, preferably hollow, threaded on its inner end 9 and secured at its other end to a ferrochrome sealing member, such as a disc, 15. A grid connector cap 16 may be secured to the outside surface of the disc 15. At the opposite end of the hollow rod 8 is a block 14, preferably of metal, secured to the rod by means of nuts 10 and 11, the grid side rods 12 being clamped to the said block in shallow grooves. The nuts may be tightened from the side tubule 3 which is arranged opposite the side tubule 2 and from the end of the tube 1 when not yet closed. The correct centering of the grid may be adjusted accurately by means of the nuts 10 and 11.

Locking rings or washers may be clamped between the block 14 and the nuts to prevent loosening, and the grid side rods may be roughened.

Figure 2 is a detail view of this construction in which the attachment of the grid side rods 12 on which the grid wire 13 is wound can be clearly seen.

Holes through the support rod 8 in registry with the hollow portion of the block may conveniently be provided to receive the cathode lead wires.

The grid may be accurately centered by shifting the block 14 along the rod 8 between the threaded nuts, and the lower end of the grid may be swung into correct position before the nuts are tightened. Further, the grid side rods may be easily slid

longitudinally along the grooves in the block to properly position the grid.

Although only one embodiment is represented, it is obvious that the grid may be supported by other means without departing from the scope of this invention. Hexagonal nuts may be used and any desired number of grid side rods may be chosen.

We claim:

1. A high power electron discharge device comprising an envelope with a cylindrical anode sealed gas-tight to an axially extending glass section, cathode leads extending through and sealed in the glass section opposite the anode seal, a wire wound grid on side rods in the anode, and means for supporting the grid concentrically in the anode comprising a stiff self-sustaining rod sealed in the side of said glass section and extending radially across the axis of the envelope, a rectangular block slidable on the inner end of said

rod, means for securing the ends of said side rods to the surfaces of said block and for rigidly fixing the position of the block on the rod.

2. An electron discharge device comprising an envelope with a cylindrical anode sealed gas-tight to an axially extending glass section, a wire wound grid on side rods in said anode with the ends of said side rods extending into said glass section, means for mechanically centering the grid in the anode and electrically connecting it to an external circuit comprising a shaft sealed in the side wall of the glass section and extending normal to the axis of said glass section, a rectangular block on the inner end of said shaft, grooves in the faces of said block to receive the ends of said side rods and threaded nuts on the shaft for pressing the side rods into the grooves and rigidly holding the block in place.

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