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RESILIENTLY SUPPORTED ELECTRODE IN ELECTRON DISCHARGE DEVICES

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Fig. 1

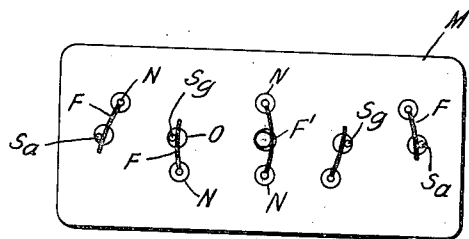
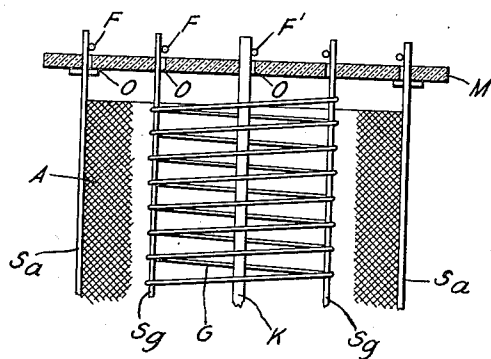


Fig. 2



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RESILIENTLY SUPPORTED ELECTRODE IN
ELECTRON DISCHARGE DEVICES

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9 Claims. (Cl. 250—27.5)

The present invention relates to electron discharge devices, and more particularly an arrangement for supporting the electrodes of such devices which, on the one hand, permits of a longitudinal expansion of the electrode support rods due to thermal action, but which, on the other hand, precludes changes in the relative position of said rods, and hence the electrodes carried thereby.

In order to avoid or diminish microphonic noises in discharge tubes, the several electrodes in themselves must be as stable and rugged as possible, and they must be similarly supported in reference to one another so that any change in the inter-electrode distances or spacing especially as a result of shocks and percussions will be avoided. However, it is not feasible to secure the ends of the electrodes in metal or insulator parts to maintain them absolutely rigid, for the reason that they will during manufacture and during use expand on account of heat action, and furthermore, were the supporting wires made of a non-yielding material, they would deform. In other words, the different supporting wires of the electrodes, where attached, must be capable of longitudinal shifting, though they should be incapable of experiencing lateral movement or displacement in the recesses of the supporting means.

In order therefore to fulfill this requirement, metallic spring members are mounted according to this invention upon a rigid support member so that the several electrode support rods are urged or firmly pressed against the rigid supporting means without impeding their longitudinal freedom of expansion. For instance, tiny springs of molybdenum or tungsten wire may be secured by means of a tubular rivet in mica spacing discs so that they will press as above stated against the electrode supports.

For a clearer understanding of the invention, reference is made to a single embodiment thereof illustrated in Figs. 1 and 2, which are respectively plan and elevational views of a three-electrode tube, although it will be readily understood that the invention is equally applicable to a tube having any number of electrodes. The tube shown is furnished with an indirectly heated cathode K, grid G, and anode A. The grid and plate electrodes are supported on wires or rods Sg and Sa, respectively. In order to maintain said support rods in proper spaced relation, there is provided at the ends thereof a disc M of insulation material, such as mica, and having openings O for accommodating the support rods. In order to

allow expansion of the rods in a longitudinal direction the openings are slightly larger than the parts passing therethrough. In order to obviate lateral displacements, spring members F are secured at one end in any suitable manner to tubular rivets N which in turn are suitably secured to the mica disc M. The other or free ends of the spring members F abut against the support rods to urge them against the wall of the openings O. If desired both ends of the spring member may be secured to rivets, and the central portion having been flexed may abut against the support rod, as shown at F' in connection with the cathode K. Other modifications may become apparent, and it is therefore desired to be limited only by appended claims and the prior art.

This application is a continuation in part of my earlier application, Serial No. 634,647, filed September 24, 1932, for Mechanical mounting of electrodes in discharge tubes.

What is claimed is:

1. An electron discharge device having a plurality of electrodes, supports therefor extending above the ends of the electrodes, an insulating member supported above the electrodes and having openings therein through which the supports pass, resilient means supported by said insulating member engaging with said supports so that lateral movement thereof with respect to the insulating member is prevented, although longitudinal movement thereof is permitted.

2. An electron discharge device having a plurality of electrodes, supports therefor extending above the ends of the electrodes, an insulating member supported above the electrodes and having openings therein through which the supports pass, means rigidly fixed to said insulating member adjacent its openings, and spring members each having one of its ends secured to the rigidly fixed means and the other end abutting an electrode support.

3. Means for supporting an electrode of an electron discharge device comprising a support rod therefor, a flat spacer member provided with an opening through which said rod extends, and a leaf spring member carried by said spacer member abutting said support rod.

4. Means for supporting an electrode of an electron discharge device comprising a flat spacer member of insulating material, said electrode comprising a tubular member which has one end extending through an opening provided in said spacer member, and spring means supported by said spacer member engaging the

extended end surface of the electrode to force the same against a face of the opening.

5 5. Means for supporting an electrode of an electron discharge device comprising a flat spacer member of insulating material, said electrode extending through an opening provided in said spacer member, and a spring member supported at both ends by said spacer member, the extended portion of the electrode being en-
10 gaged by an intermediate portion of the spring member to urge the electrode against the surface of the opening.

6. An electron discharge device comprising a cathode, an anode, and a grid, an extension
15 secured to said cathode, a support carrying said grid, an insulating spacer member carried by said anode and having apertures through which said extension and said support extend loosely, and resilient members secured to said member
20 and frictionally engaging said extension and said support.

7. An electrode assembly for electron discharge

devices, comprising a support having an aperture therein, an electrode having a portion extending through said aperture, and resilient means slidably engaging said portion and main-
5 taining said portion laterally in position relative to said support.

8. An electrode assembly for electron discharge devices, comprising a support having an aperture therein, an electrode having a portion extending through said aperture, and a leaf spring
10 having one end secured to said support and the other end frictionally engaging a side of said portion.

9. An electron discharge device comprising a plurality of electrodes, an insulating member
15 carried by one of said electrodes and having an aperture therein, another of said electrodes having a portion extending loosely through said aperture, and a resilient member mounted on said insulating member and slidably engaging said
20 portion.

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