

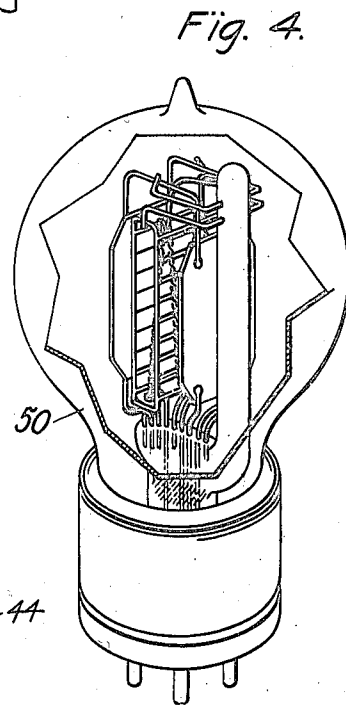
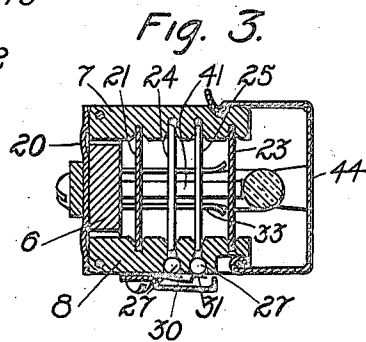
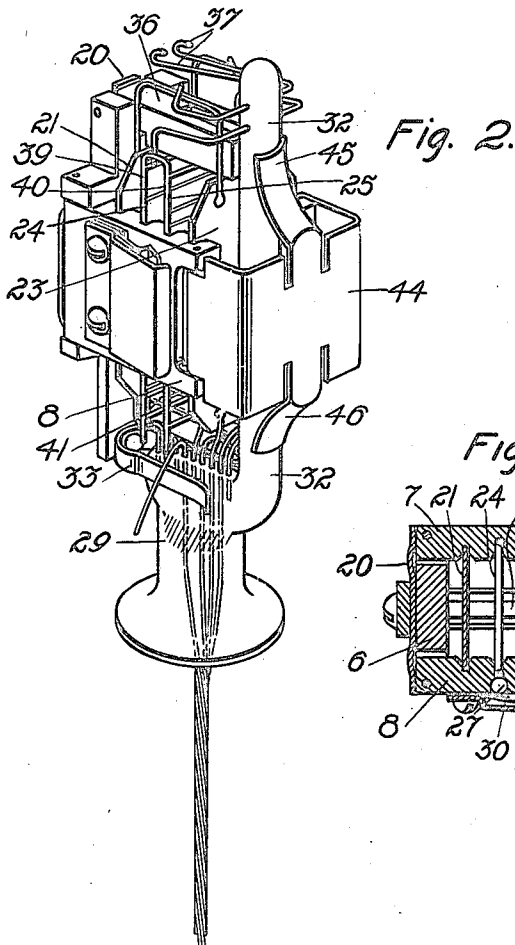
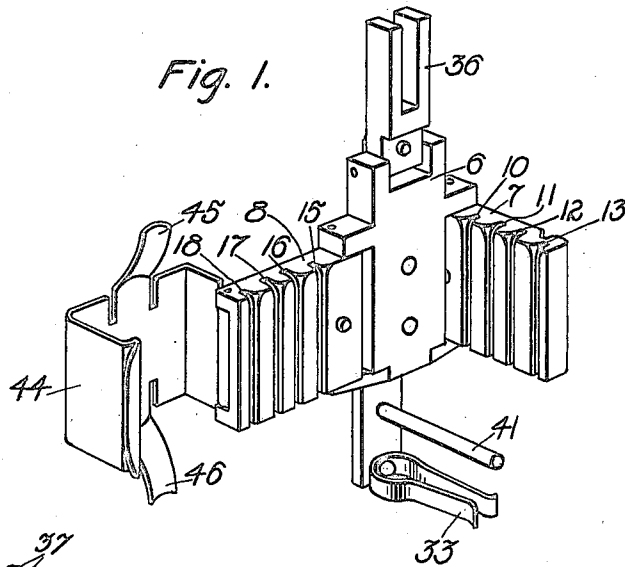
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W. J. LEVERIDGE

VACUUM TUBE ELECTRODE ASSEMBLING JIG

Filed Aug. 29, 1919



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UNITED STATES PATENT OFFICE.

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VACUUM-TUBE-ELECTRODE ASSEMBLING JIG.

Application filed August 29, 1919. Serial No. 320,576.

To all whom it may concern:

Be it known that I, WALTER J. LEVERIDGE, a subject of the King of Great Britain, residing at Mount Vernon, in the county of Westchester, State of New York, have invented certain new and useful Improvements in Vacuum-Tube-Electrode Assembling Jigs, of which the following is a full, clear, concise, and exact description.

This invention relates to an assembling jig for vacuum tube electrodes and has for an object the provision of a unitary structure that may be employed for holding and spacing the electrodes while they are being fastened to their supporting stem which is to be sealed in the bulb of the vacuum tube.

This invention is particularly adapted to be employed in connection with vacuum tubes, the electrodes of which are supported from a vertical stem which arises from the glass squash or press in the lower portion of the tube. Since it is important that the electrodes of a vacuum tube be spaced accurately with respect to each other and aligned properly with respect to the stem and squash of the tube, the assembling jig of this invention has been provided.

This assembling jig comprises a main body member having two pivoted side portions or plates which, by suitable spring means are adapted to be held at times in parallel relation with each other. These side portions contain spaced grooves for the electrodes of such depth that when the plates are in the parallel relation with each other, the electrodes are held rigidly therebetween. Spacing members are also provided at both ends of the main body member for maintaining the jig in the desired relation with respect to the glass stem. The jig is supportingly fastened to the glass squash by suitable spring means such as a spring clip between the arms of which the squash may be inserted.

This invention will be better understood by reference to the following detailed description taken in connection with the accompanying drawings in which Fig. 1 represents the preferred form of this invention; Fig. 2 represents the assembling jig supporting a plurality of electrodes which are to be fastened to an electrode support; Fig. 3 is a cross-sectional view of Fig. 2, taken through the main body portion of the assembling jig; and Fig. 4 represents a vacuum

tube having an electrode structure of the type which is to be held by the assembling jig of this invention.

Referring to the drawing, 6 is a body member to which are pivoted two plate members 7 and 8. The inside face of plate 7 contains a plurality of parallel grooves 10, 11, 12 and 13 which are spaced with respect to each other according to the distance desired between the various parts of the electrode structure to be held by the jig. The inside face of plate 8 contains similar grooves 15, 16, 17 and 18. Plates 7 and 8 are adapted to be held in parallel relation with respect to each other by means of a spring 20 which is mounted on the back face of the main body member 6. The depths of grooves 10 and 15 are such that when the plates 7 and 8 are in parallel relation with each other, the plate electrode 21 is held tightly therebetween. Similarly grooves 13 and 18 are of such a depth that the plate electrode 23 when inserted in the grooves, is held rigidly between the plates 7 and 8. In case it is desired to have less tension on the two parts 24 and 25 of the grid electrode than on the other electrodes supported by the jig, it may be necessary to provide pockets in the bottoms of grooves 16 and 17 in each of which a steel ball 27 may be placed. These balls may be pressed tightly against the edges of the grid in grooves 16 and 17 by means of the two springs 30 and 31.

The assembling jig may be rigidly fastened to the squash of the stem on which the electrodes are to be mounted, by means of a spring clip 33. This spring clip also serves to align the electrodes with respect to the squash. Pivoted to the upper end of the main body portion 6 is a spacing member 36 which determines the position of the jig with respect to the stem 32. Member 36 is shown slotted on account of wires 37 which would otherwise interfere with the positioning of the member. The length of arm 36 should be such that when its free end is in contact with stem 32, the electrodes held by the jig are spaced properly away from the stem. The thickness of arm 36 should be such that when it rests on the top edges of plates 21 and 23 and the two bars 39 and 40 of the grid, the electrodes are the proper distance away from the squash 29. A lower spacing arm 41 is also provided of such a

length that when its free end is in contact with the glass stem, the lower portions of the two electrodes are spaced properly with respect to the lower end of the stem 32.

5 In case it is desired to have additional means besides the spring clip 33 for holding the jig to the stem, a resilient latch-plate 44 may be provided which may be pivoted to plate 8 and adapted to hook over the end of plate 7. Spring arms 45 and 46 of this plate 10 serve to keep the ends of the spacing arms 36 and 41 in contact with stem 32. Plate 44 also aids spring 20 in keeping plates 7 and 8 pressed tightly against the electrodes.

15 After the plates 21, 23 and grid portions 24 and 25 have been spaced in the jig, the squash 29 of the electrode support may be inserted into the spring clip 33. The electrodes are then in proper position with respect to stem 32 so that the connecting and 20 supporting wires in the squash and the stem may be fastened to the electrodes in any suitable manner. After the wires have been fastened, the assembling jig may be 25 removed and the stem 32 with the electrodes supported by it, are ready to be sealed in the glass bulb of the vacuum tube for which it is designed.

30 Fig. 4 shows the electrode structure assembled in Fig. 2, embodied in a vacuum tube 50 of the well-known audion type.

It is to be understood that this assembling jig may be employed for assembling electrodes of various types of tubes such as 35 X-ray tubes, mercury arc devices and the like.

What is claimed is:

1. A jig comprising a main body portion having relatively movable members pivoted 40 thereto and adapted to hold between them a plurality of electrodes, said movable members being provided with means for spacing said electrodes from each other.

2. A jig comprising a main body portion 45 having relatively movable members pivoted thereto and adapted to hold between them a plurality of electrodes, said movable members having slots to receive the edges of said electrodes to arrange them in their proper 50 relative positions whereby said electrodes may be fixed in said positions.

3. A jig comprising a main body portion and a plurality of arms pivoted to said body 55 portion on opposite sides thereof for clamping between them a plurality of electrodes, said arms being provided with means for spacing said electrodes from each other to arrange them in their proper relative positions whereby said electrodes may be fixed in 60 said positions.

4. In the manufacture of devices employing electrodes and wherein the electrodes are to be fastened to supporting wires, a jig comprising a main body portion and relatively 65 movable members pivoted thereto and

adapted to hold between them said electrodes, said members having slots to receive the edges of said electrodes to arrange them in a desired position whereby said electrodes may be fastened to said wires to maintain 70 said position.

5. In the manufacture of devices employing electrodes and wherein the electrodes are to be fastened to supporting wires, a jig comprising a main body portion and relatively 75 movable members pivoted thereto and adapted to hold two anode surfaces and two grid surfaces, said members being provided with means for spacing said surfaces parallel to each other whereby said electrodes may be fastened to said wires to maintain said 80 parallel relation.

6. In the manufacture of devices employing electrodes and wherein the electrodes are to be fastened by supporting wires to an 85 electrode support, a jig comprising relatively movable members for holding said electrodes while said electrodes are fastened to said support, and spacing members for fixing the 90 space relation of said jig with respect to said support, said spacing members being positioned to engage said support at opposite sides of said electrodes.

7. In the manufacture of devices employing electrodes and wherein the electrodes are to be fastened by supporting wires to an 95 electrode support, a jig comprising a main body portion, a plurality of arms pivoted to said body portion on opposite sides thereof for clamping between them said electrodes 100 while said electrodes are being welded to said wires, and spacing members on said jig for determining the space relation of said jig with respect to said support while said electrodes are being welded to said wires, said 105 spacing members being positioned to engage said support at opposite side of said electrodes.

8. An assembling jig for vacuum tube 110 electrodes comprising a main body portion, a pivoted arm on one side of said body, a pivoted arm on the opposite side of said body, spring means acting on said arms for holding said arms against the edges of said 115 electrodes whereby said electrodes may be supported, and means integral with said arms for spacing said electrodes.

9. An assembling jig for vacuum tube electrodes comprising a main body portion, an 120 arm pivoted to one side of said body, a second arm pivoted to the opposite side of said body, spring means for holding said electrodes edgewise between said arms, a plurality of spacing arms for spacing said jig 125 with respect to an electrode support to which said electrodes are to be attached, and means for holding said jig in the position determined by said spacing arms.

10. An assembling jig for electrodes comprising means for supporting said electrodes 130

in the desired relation to one another, and members for maintaining said jig in the proper space relation with respect to the support to which said electrodes are to be fastened, said supporting means being interposed between said spacing members.

11. An assembling jig for vacuum tube electrodes comprising a main body portion, a plurality of arms pivoted to said body portion, said arms being grooved whereby the edges of said electrodes may be inserted therein and held between said arms, and spring means for holding said arms tightly against said electrodes.

12. An assembling jig for vacuum tube electrodes comprising a main body portion, a plurality of arms pivoted to said body portion, each of said arms being grooved on one side, the spacing between said grooves being determined by the distance desired between the electrodes to be held by the jig, said grooves being of sufficient width to receive the edges of the electrodes to be held, and spring means for clamping said arms tightly against said electrodes.

13. An assembling jig for vacuum tube electrodes comprising a main body portion, two plates pivoted to said body portion each of said plates having a plurality of parallel grooves, the spacing between said grooves on each plate being determined by the distance desired between the electrodes to be held by said jig, spring means for holding said plates in a substantially parallel relation to each other, the distance between the bottom of the groove in one of said plates and the bottom of the corresponding groove in the other of said plates being substantially the same when said plates are in said parallel relation as the width of the electrode member to be held therebetween.

14. An assembling jig for vacuum tube electrodes comprising a main body portion, two plates pivoted to said body portion, each of said plates having a plurality of parallel grooves, said grooves being of sufficient width to receive the edges of the electrodes to be held, the spacing between said grooves on each plate being determined by the distance desired between the electrodes to be

held by said jig, means comprising a spring fastened to said body portion for holding said plates in a substantially parallel relation with respect to each other, the distance between the bottom of each groove in one plate and the bottom of the corresponding groove in the other plate being substantially the same when said plates are in said parallel relation as the width of the electrode member to be held therebetween, said spring acting to hold said plates tightly against said electrodes.

15. An assembling jig for vacuum tube electrodes comprising a main body portion, a plurality of arms pivoted to said body portion, said arms being grooved whereby the edges of said electrodes may be inserted therein and held between said arms, spring means for holding said arms tightly against said electrodes, and means for spacing said jig with respect to the support to which said electrodes are to be fastened.

16. An assembling jig for vacuum tube electrodes comprising a main body portion, two plates pivoted to said body portion, said plates being grooved whereby the edges of said electrodes may be inserted therein and held between said plates, a plurality of spacing arms for spacing said jig with respect to the electrode support to which said electrodes are to be attached, and means for holding said jig in the position determined by said spacing arms.

17. An assembling jig for vacuum tube electrodes comprising a main body portion, two plates pivoted to said body portion, said plates being grooved whereby the edges of said electrodes may be inserted therein and held between said plates, a plurality of spacing arms for spacing said jig with respect to the electrode support to which said electrodes are to be attached, and a spring clip on said body portion adapted to hold said jig to said electrode support in the position determined by said spacing arms.

In witness whereof, I hereunto subscribe my name this 27th day of August, A. D., 1919.

WALTER J. LEVERIDGE.