Dec. 6, 1949 E. W. DEISS ET AL 2,490,037

SOCKET FOR ELECTRON DISCHARGE TUBES

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Fig. 1

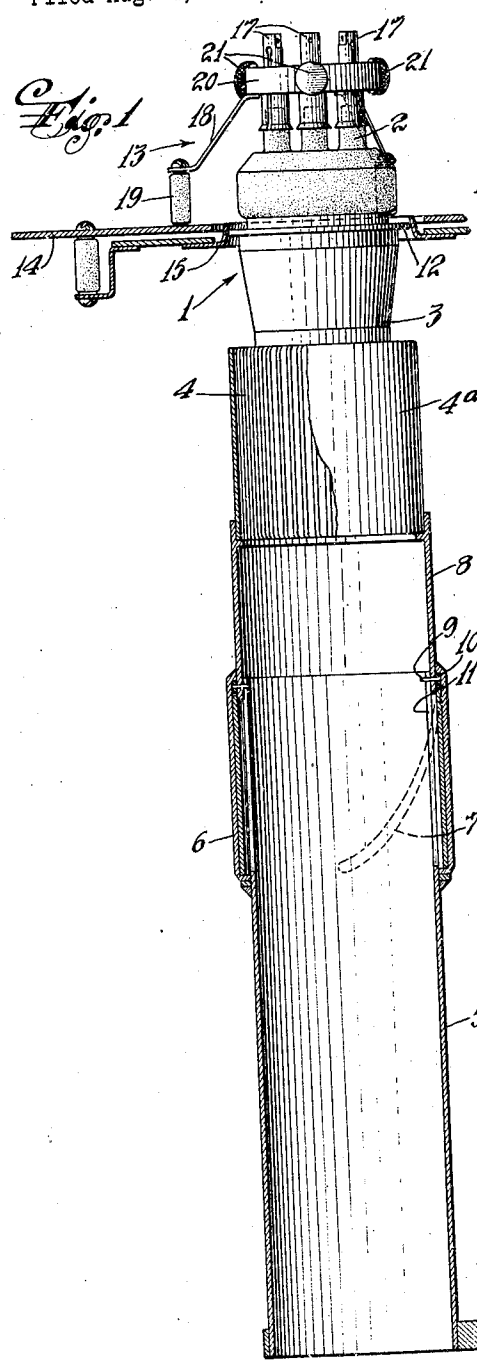
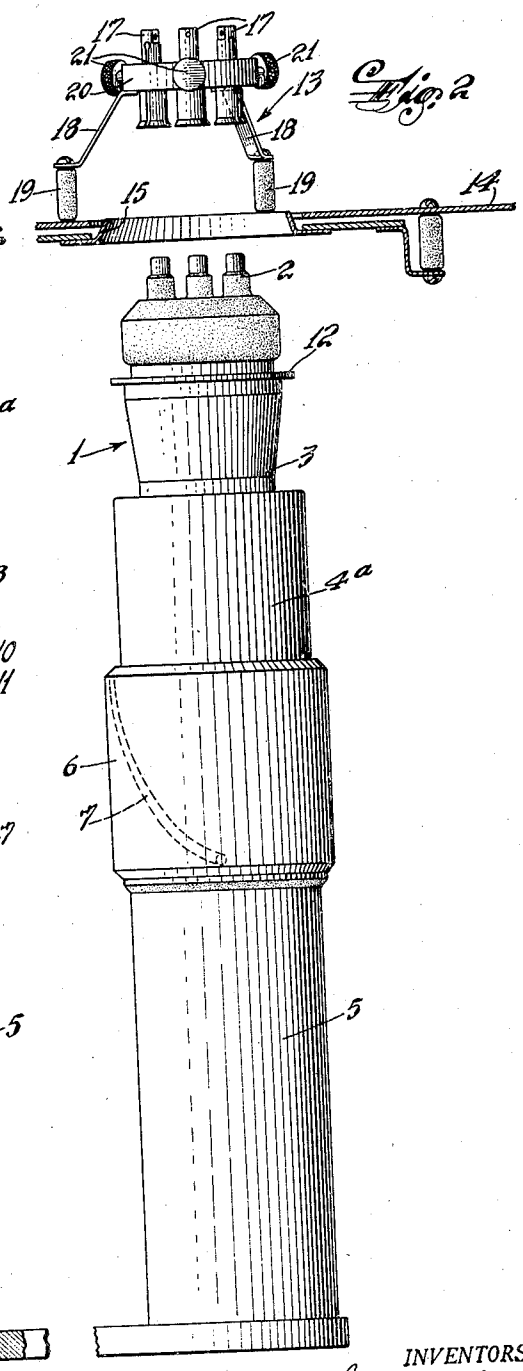


Fig. 2



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Fig. 3

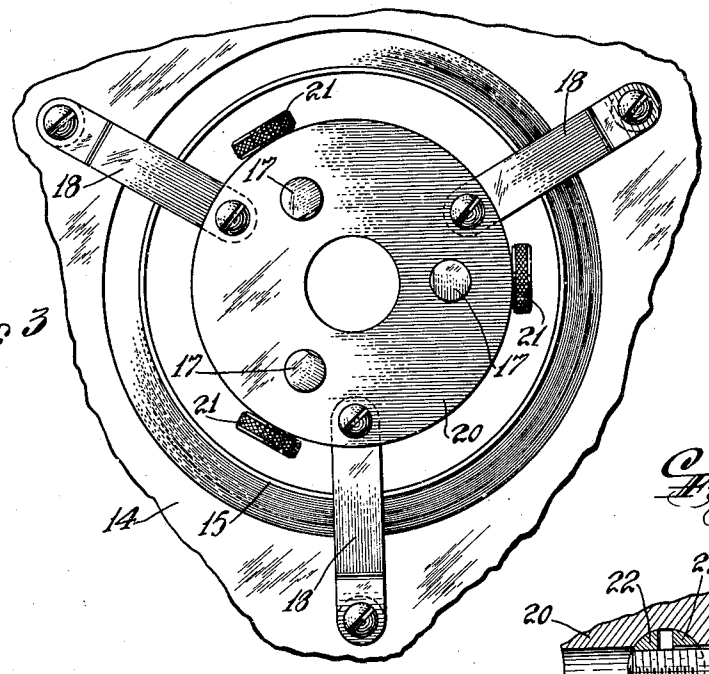


Fig. 5

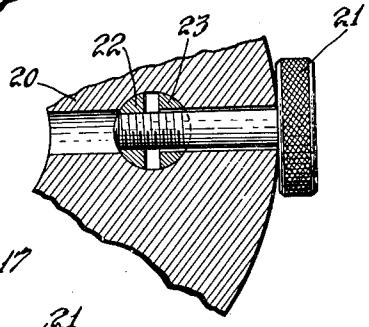
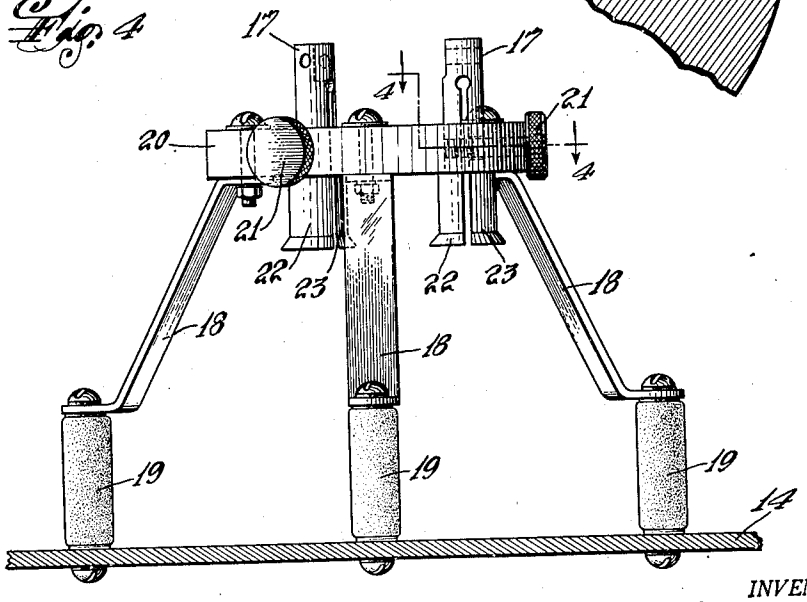


Fig. 4



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SOCKET FOR ELECTRON DISCHARGE TUBES

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5 Claims. (Cl. 250—27.5)

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This invention relates to a tube socket assembly and more particularly to a mounting for an electron discharge tube in a tube socket wherein the tube is secured in place and electrical connections made.

It is an object of the invention among others to provide a tube socket assembly wherein an electron discharge tube is associated with a supporting member and is movable on said support member into engagement with a tube socket; a tube socket assembly wherein the tube socket is flexibly mounted to care for any misalignment of the tube parts entering the tube socket to relieve stress and strain on the tube parts; and a tube socket assembly that is simple and economical in construction and durable and long lasting in operation.

In carrying out the objects of the invention there is provided a tube socket assembly comprising a support for an electron discharge tube having a plurality of terminals on one end thereof. The support may include a column member with a telescoping collar to raise and lower the tube. A rotatable sleeve is mounted on the column and is rotatable with relation to the support column. The sleeve has a cam slot into which a pin on the collar extends and said pin moves up and down in the cam slot upon rotation of the sleeve member for movement of the collar which in turn supports the tube.

A tube socket into which the electron discharge tube extends is provided having a plurality of terminal sockets. When the tube is raised on the support column the terminals on the tube extend into the terminal sockets to electrically connect the tube with the tube socket. The terminal sockets are flexibly mounted on spring strap members, to adjust themselves to any misalignment between the terminals and the terminal sockets. Each terminal socket member is made of parts which are spread apart to guide the terminals into the terminal sockets after which, clamp means associated with the terminal sockets parts, are tightened to clamp the terminal socket parts about the terminals to electrically connect the tube with the tube socket parts. A conductor flange is provided in the tube socket for contact with the grid ring terminal located near the top portion of the tube.

With the foregoing and other objects in view, the invention will be more fully described hereinafter and will be particularly pointed out in the claims appended hereto.

In the drawings, where like symbols refer to

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like or corresponding parts throughout the several views:

Figure 1 is a part elevational view and a part sectional view of the tube socket assembly with an electron discharge tube of the power amplifier type shown assembled in the tube socket and the support column, collar and sleeve shown in section.

Figure 2 is an elevational view of the tube socket assembly showing the tube withdrawn from the tube socket.

Figure 3 is a top plan view showing the terminal sockets within the tube socket.

Figure 4 is an elevational view of the terminal sockets and their mounting within the tube socket.

Figure 5 is a sectional view showing means for clamping terminal socket parts about a terminal.

In Figures 1 and 2 is shown an electron discharge tube 1 provided at the top with terminals 2 which as shown are three in number and an anode structure 3 at the bottom. A plurality of cooling vanes 4 is included in the anode portion of the tube through which a cooling medium such as air is forced. While tube 1 may be shown of the power amplifier type other types of tubes having one or more end terminals similar to terminals 2 may, of course, be used with the socket features of our invention.

A supporting means including a column 5 is provided which has a sleeve 6 rotatably mounted thereon. The rotatable sleeve 6 has a cam shaped slot 7 therein as indicated in dotted line on the drawing. A collar member 8 carries tube 1 and is connected by means of a pin 9 and a roller 10 to the rotatable sleeve 6. The roller 10 is small and is rotatably suported by pin 9. Roller 10 and pin 9 are forced vertically up and down, depending upon which direction the sleeve 6 is rotated since pin 9 is connected to collar 8. The rotatable sleeve 6 has roller 10 riding in cam shaped slot 7 while pin 9 rides in vertical slot 11 in support column 5. Hence the vertical movement of the collar 8 is effected by having the pin 9 extend into vertical slot 11 contained in support column 5. As roller 10 follows cam slot 7 it carries pin 9 vertically in slot 11, either up or down.

The cooling medium employed to cool the tubes may be air which may be forced up through supporting column 5, rotatable sleeve 6 and collar 8 and out through the cooling vanes 4. The tube 1 has an anode connection made through the supporting means, which supporting means constitutes collar 8, rotatable sleeve 6 and supporting column 5 while the terminals 2 fit into a tube socket and make the cathode connection. The

tube 1 has an annular ring 12 portion extending outwardly of the tube 1 about halfway between the upper and lower ends thereof to provide an electrical connection with the grid of the tube when mounted in a tube socket. The cooling vanes 4 on the anode portion of the power tube are covered by a cylinder 4a with the left hand side of the cylinder 4a being broken away to indicate the presence of cooling vanes 4.

A tube socket assembly 13 is shown connected to a base plate or panel 14 with a frusto-conical conductor 15 being mounted around a central opening in panel 14. Frusto-conical conductor 15 contacts the grid ring 12 on the tube 1 to electrically connect the grid of the tube with the tube socket. Terminal socket members 17 are provided in the tube socket to receive the terminals 2 of the tube 1 when the tube is entered into the tube socket. The terminal socket members 17 are provided with a limited degree of freedom in order that the terminals 2 of the tube 1 may easily enter the terminal sockets 17. If any misalignment between the terminals 2 and the terminal sockets 17 occurs, the terminal sockets 17 are sufficiently flexible to adjust themselves to the location of terminals 2 and thereby avoid exertion or stress on the terminals 2. This is of great advantage since rigid terminal sockets tend to damage the tube terminals and thereby ruin expensive power tubes during the mounting thereof. This flexibility, resiliency or freedom of movement is provided for by connecting straps 18, best shown in Figure 4. The straps 18 are connected with post members 19 which are in turn connected to plate or panel 14. The posts 19 may be made of a flexible material, such as rubber, to give flexibility to the straps 18, or the connection between straps 18 and posts 19 may be loose or made with some flexibility in order that a limited amount of flexibility will be present in terminal sockets 17. The tops of connecting straps 18 are connected to a plate 20, which plate 20 carries terminal sockets 17. Some or all of the terminal sockets 17 may be made in two parts connected together at the top thereof. They have a set screw 21 extending into plate 20 and through the terminal socket parts 22 and 23. Set screws 21 can be screwed in one direction to spread parts 22 and 23 of the respective terminal sockets apart to allow plenty of space for terminals 2 to enter the respective terminal sockets 17. When the terminals 2 have been lifted into the terminal sockets 17, set screws 21 are tightened to draw parts 22 and 23 together about terminal 2 insuring good electrical connection. If the alignment of terminals 2 and terminal sockets 17 is not exact, any stress or strain caused by the tightening of set screws 21 will be taken up by the resiliency or elasticity of the mounting of straps 18.

It can thus be seen that a power tube support is provided on which an electron discharge tube 1 is mounted, and the tube 1 can be raised into engagement with tube socket 13 for operative purposes. The support means for tube 1 includes support column 5, rotatable sleeve 6 and collar 8 which carries tube 1. Figure 2 shows the tube mounted on the supporting means ready to be advanced into tube socket 13. To raise the tube 1 into tube socket 13, sleeve 6 is rotated with wheel 10 following cam slot 7 and pin 9 advancing upwardly in groove 11 until collar 8 is raised to the position of Figure 1. Sleeve 6 is turned in the opposite direction to lower collar 8 to the position of Figure 2. Terminal sockets 17 have parts 22 and 23 spread apart to receive terminals 2 of

tube 1. When terminals 2 are entered into terminal sockets 17 set screws 21 are tightened, pulling parts 22 and 23 together about the terminals thus effecting perhaps the cathode connection. Any misalignment between terminals 2 and terminal sockets 17 is cared for by the flexibility in the mounting of straps 18.

While the invention has been described in connection with a particular construction, it is to be understood that the words which have been used are words of description rather than limitation, and that practice of the invention within the scope of the appended claims may be resorted to without departing from the true scope of the invention in all its aspects.

We claim:

1. An assembly for receiving and facilitating electrical connections with an electron discharge tube of the type having a plurality of longitudinally extending terminals at one end thereof and an intermediate transversely disposed ring terminal together with a generally cylindrical vaned terminal at the end distant from the end carrying the longitudinally extending terminals, that comprises a support, a plate resiliently mounted upon said support, a plurality of sockets mounted in said plate aligned with and for receiving the longitudinally extending terminals of the tube, means for tightening the said sockets about the tube terminals whereby the effective socket size can be reduced to cause engagement with the terminal, an annular member mounted on said support positioned to receive and engage with the annular terminal of the tube, a first tubular element for receiving and establishing electrical connection with the vaned terminal on the end of the tube, said first tubular member being supported in coaxial alignment with the tube when the longitudinally extending tube terminals are engaged with the sockets, means for axially moving said first tubular member relative to said sockets, plate and support, that comprises a second tubular member adapted to receive the said first tubular member in telescoping relationship, said second tubular member having a pair of diametrically located longitudinally extending slots formed therein, a pair of diametrically located radially extending pins mounted on said first tubular member slidingly received in said slots, and a collar mounted upon said second tubular member capable of free rotative motion but incapable of axial motion, said collar having an internal helical groove formed therein engaging with said pins whereby rotation of the collar is translated into axial motion on said tubular member.

2. An assembly as defined in claim 1, further characterized in that each of the sockets for receiving the longitudinally extending terminals of the tube comprises a longitudinally slotted tubular member having an internal diameter approximately equalling the diameter of the tube terminals, and a transversely disposed screw engaging with one part of said slotted tubular member for reducing the slot width and thereby diminishing the internal diameter of the socket to cause gripping of a tube terminal positioned therein.

3. An assembly for receiving and facilitating electrical connections with an electron discharge tube of the type having a plurality of longitudinally extending terminals at one end thereof and an intermediate transversely disposed ring terminal together with a generally cylindrical vaned terminal at the end distant from the end carry-

ing the longitudinally extending terminals, that comprises a support, a plate resiliently mounted upon said support, a plurality of sockets mounted in said plate for receiving the longitudinally extending terminals of the tube, means for tightening the said sockets about the tube terminals whereby the effective socket size can be reduced to cause engagement with the terminal, an annular member mounted on said support positioned to receive and engage with the annular terminal of the tube, and a tubular element for receiving and establishing electrical connections with the vaned terminal on the end of the tube, said tubular member being supported in coaxial alignment with the tube when the longitudinally extending tube terminals are engaged with the sockets.

4. An assembly as defined in claim 3, further characterized in that each of the sockets for receiving the longitudinally extending terminals of the tube comprises a longitudinally slotted tubular member having an internal diameter approximately equalling the diameter of the tube terminals, and a transversely disposed screw engaging with one part of said slotted tubular member for reducing the slot width and thereby diminishing the internal diameter of the socket to cause gripping of a tube terminal positioned therein.

5. An assembly for receiving and facilitating electrical connections with an electron discharge tube of the type having a plurality of longitudinally extending terminals at one end thereof and a generally cylindrical vaned terminal at the end distant from the end carrying the longitudinally extending terminals, that comprises a support, a plate resiliently mounted upon said support, a plurality of sockets mounted in said plate for receiving the longitudinally extending terminals of

the tube, means for tightening the said sockets about the tube terminals whereby the effective socket size can be reduced to cause engagement with the terminal, a first tubular element for receiving and establishing electrical connection with the vaned terminal on the end of the tube, said first tubular member being supported in coaxial alignment with the tube when the longitudinally extending tube terminals are engaged with the sockets, means for axially moving said first tubular member relative to said sockets, plate and support, that comprises a second tubular member adapted to receive the said first tubular member in telescoping relationship, said second tubular member having a pair of diametrically located longitudinally extending slots formed therein, a pair of diametrically located radially extending pins mounted on said first tubular member slidingly received in said slots, and a collar mounted upon said second tubular member capable of free rotative motion but incapable of axial motion, said collar having an internal helical groove formed therein engaging with said pins whereby rotation of the collar is translated into axial motion on said tubular member.

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