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W. MAKENNY

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RADIO TUBE BASE AND SOCKET

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Fig. 1.

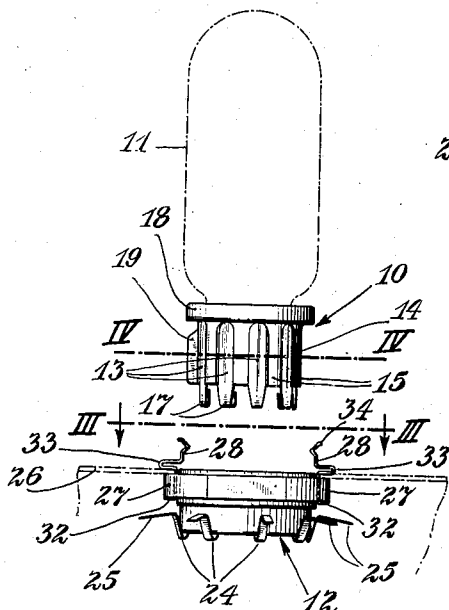


Fig. 2.

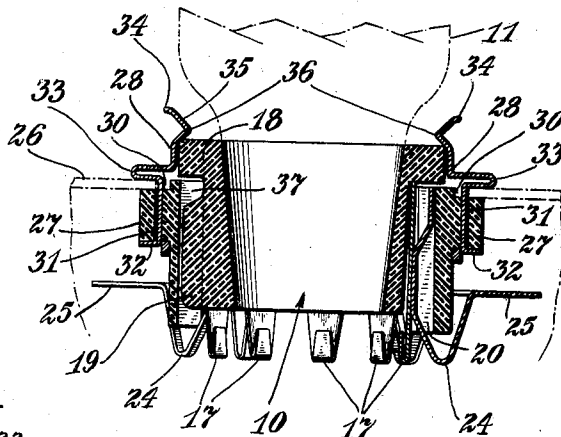


Fig. 3.

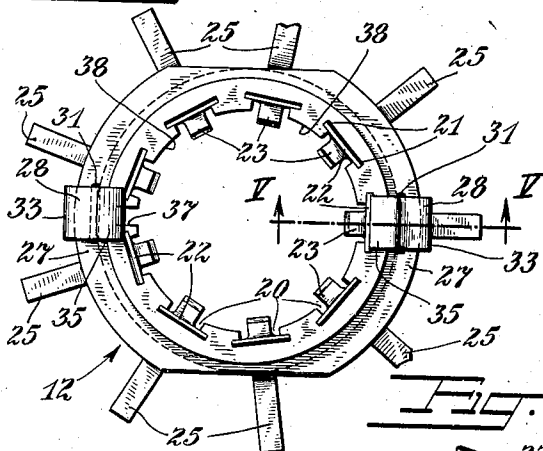


Fig. 4.

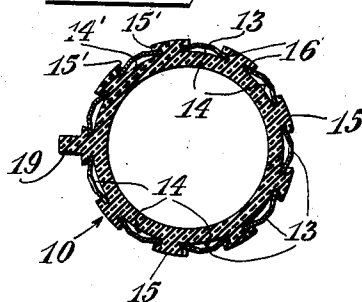


Fig. 5.

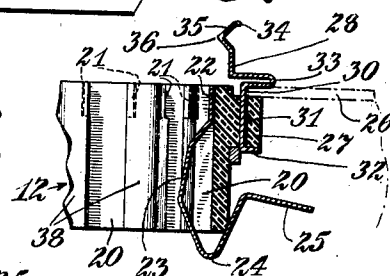


Fig. 6.

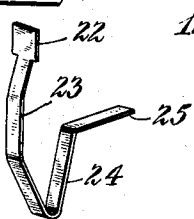
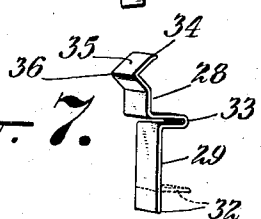


Fig. 7.



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RADIO TUBE BASE AND SOCKET

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4 Claims. (Cl. 250—27.5)

This invention relates to an electrical vacuum device and more particularly to a vacuum tube base and a socket to receive the base. Although the present invention is applicable to various types of vacuum tubes it will be shown and described as applied to a radio receiving tube.

Radio tubes are usually made with a base having tubular contact pins projecting from a bottom wall thereof and sockets are provided with apertures to receive the contact pins and the tube is then supported and held in electrical connection with a circuit.

Developments in the art of radio tube manufacture have brought about certain improvements in radio tubes whereby the number of contact members have been greatly increased and, whereas four or five contact members were usually employed, certain improved types of tubes are provided with additional internal elements which require from seven to nine or more external contacts. Furthermore, the tendency is to reduce the size of the tube so that it will meet the proportions of small-sized receiving sets.

In many types of radio tube receiving sets, particularly sets of relatively small size, the sockets are secured in spaced relation in apertures in a plate or supporting structure which is termed a chassis. Under certain conditions the tubes are held in the chassis with the bulb portion projecting downwardly and it is desirable to provide a base and a cooperating socket wherein the base will be held in the socket against displacement if it is used in an inverted position or against relative movement due to jars or vibration.

In receiving sets which are portable or which are used in automobiles, considerable vibration exists and it often happens that the radio tubes lose the desired intimate contact relation with the circuit as is necessary between the contacts on the base and the contacts in the socket.

Furthermore, in small-sized receiving sets, it becomes a problem to properly arrange the contacts, particularly when a great number are employed to obtain the necessary intimate contact to provide the required electrical connection.

It is an object of the present invention, therefore, to provide a radio tube having a base capable of cooperating with a socket to maintain the base and socket in intimate electrical relation.

Another object of the invention is to provide a base of suitable insulating material with a plurality of contacts which may be conveniently and quickly assembled.

A further object of the invention is to provide a base having a plurality of contacts arranged

for electrical connection with contacts in a socket and means for holding the base in its desired electrically connected position against accidental displacement.

A still further object of the invention is to provide a socket which may be quickly and conveniently attached to a supporting plate in combination with means for holding a base against displacement in the socket.

Another object of the invention is to provide a socket having means capable of securing the socket to a supporting plate and for cooperating with the base to lock the same in the socket.

Other objects and advantages of the invention will be more fully understood from the following description together with the accompanying drawing in which—

Fig. 1 is a side elevational view of a base and socket constructed in accordance with the present invention;

Fig. 2 is an enlarged vertical cross-sectional view of a base after insertion into a socket;

Fig. 3 is an enlarged view taken on line III—III in Fig. 1;

Fig. 4 is an enlarged view taken on line IV—IV in Fig. 1;

Fig. 5 is a view taken on line V—V in Fig. 3; Fig. 6 is a perspective view of one of the socket contacts and

Fig. 7 is a perspective view of locking means for holding a base in contact relation with a socket.

The selected embodiment of the invention, as illustrated, may comprise a body preferably of tubular form of suitable insulative material constituting a base 10 for a radio tube or other device, the bulb 11 of which is indicated in dotted lines. The base 10 is proportioned for insertion in a socket 12 which may be of any suitable insulative material.

As shown, the base 10 is provided with a plurality of contact members 13 which are disposed in slots 14 in the surface of an outer cylindrical wall 15 of the base. The slots, as more clearly shown in Fig. 4, are each provided with lateral extensions 16 and constitute a mortise to receive the contact members 13. These members may be formed from metallic sheet material and each member may be of arcuate shape in transverse cross-section substantially throughout its length.

The normal width of a contact member or strip 13 may be slightly greater than the total width of a slot 14 so that upon insertion, the strip may be bent to slightly reduce its width

and then permitted to spring apart to tightly fit into a slot. It will be evident that, by reason of the arcuate form of the contact members in transverse cross-section, they may, if desirable, be made of slightly less width than the width of the slots. When the contact is inserted into a slot the side edges of the member are disposed beneath the projecting edge of the slot which edge engages the arcuate surface on the convex side and tends to flatten the contact with the result that it is firmly held by frictional and tensional engagement with the insulation material. For the purpose of more tightly holding the contact strips in a slot, the bottom surface 14' of each slot may taper outwardly from the open end toward the opposite end so that as the contact member is inserted inwardly a slightly wedging action will occur causing the contact to be more firmly gripped between the projecting edges 15' of the slots and the bottom surface thereof.

The contact members 13 may be of similar length and, when disposed in the slots, portions 17 extend beyond the ends of the slots and are desirably bent inward as illustrated for connection with the leading-in wires extending from and connected with the elements within the bulb 11. The base 10 may be provided with an annular flange 18 and with a guide lug 19 for purposes to be later described.

The socket 12 may be in the form of a ring having internal slots 20 disposed in the same circumferential spaced relation as the contacts of the base.

These slots 20 may be provided at their normal upper ends with oppositely disposed recesses 21 to receive a head 22 of a contact member 23. The contact members are of similar form and the heads 22 may be moved into position in the recesses and the body portions of the contacts may be arranged to lie in the slots 20. The ends 24 of the contacts may be of any suitable form and, as shown, are bent so that portions 25 extend outwardly from the outer wall of the socket so that the usual conductor wires of the circuit may be secured thereto.

The socket shown is constructed to be attached to a supporting plate or chassis 26 constituting a portion of a radio receiving apparatus. For the purpose of attaching the socket to the plate, the socket is provided with suitable lugs 27 and what may be termed retainer and locking members 28 are provided to secure the socket to the plate 26. Each of the members 28 may be formed from a metallic strip which, as shown in Fig. 7, has a straight portion 29. When the socket is in position the portion 29 is inserted through the aperture 30 provided in the plate to receive the upper edge of the socket and through a slot 31 in the lug 27.

An end 32 of the portion 29 is then bent over to engage the under side of a lug 27. The member 28 is provided with an extension or stop 33 which engages the plate 26 so that when the end 32 is bent around the lug 27 the lug and plate are clamped together between the extension 33 and the end 32 of the member 28.

For the purpose of locking the base in position, the member 28 is provided with a resilient snap catch 34 having an inclined surface 35 to engage the flange 18 of the base when the base is inserted into a socket. A movement of the flange serves to press the resilient member outwardly until it has passed a bend 36 in the member which latter, by reason of its resiliency,

moves toward and engages the flange 18 thus locking the base, and consequently the vacuum device, in position.

For the purpose of aligning the contacts of the base for engagement with the proper contacts in the socket, the latter is provided with a slot 37 to receive the guide lug 19. It will be understood that the base is so proportioned that portions of the cylindrical surface thereof will slidably fit internal cylindrical portions 38 of the socket so that the actual bearing between the base and the socket is carried by the insulative material, the contacts being made by reason of the spring contact members 23 of the socket which are constructed to normally spring outwardly beyond the depth of their slots 20.

From the foregoing it will be evident that the present invention provides a novel form of electrical fitting comprising a base and cooperating socket and that the base may be readily molded of suitable material with the necessary slots to receive the contact members.

Furthermore, the invention provides a cheap and effective construction for securing the socket to a base and the means provided to perform the additional function of securing the base in the socket. Although the base is provided with a collar to engage the locking members, it is to be understood that, if desirable, the locking members may engage relatively small extensions or lugs on the base or the locking members may be arranged to enter recesses formed in the base material. In either case, the operation of retaining the base in position by means of locking members for the purpose of maintaining the respective contacts in engagement will be attained.

Although the present construction is shown and described as applied to a radio tube base having a large number of contact members, it is to be understood that the invention is equally applicable for use with devices where a greater or lesser number of contacts are employed and that the locking means may be used in connection with various types of vacuum or other electrical devices where it is desirable to hold the device against accidental removal.

It will also be understood that the present invention may be practiced with bases and sockets other than of cylindrical form as for example a flat-sided base may be employed with a socket having a recess with corresponding straight walls.

Although a preferred embodiment of the invention is shown and described herein, it is to be understood that modifications may be made therein without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. A base for a vacuum device comprising a tubular insulative body having a longitudinal slot in its outer surface extending straight without interruption from end to end, said slot being open at one end to slidably receive a contact member, and having lateral edge portions adapted to overlie said member and hold it in place, and a flexible contact member in said slot having a normal width slightly greater than the width of said slot and bent to arcuate form in transverse cross section to present a substantial contact surface, the side edges of said member resiliently engaging the sides of said slot beneath said edge portions to frictionally hold said

member against longitudinal withdrawal from said slot.

5 2. A base for a vacuum device comprising a tubular insulative body having a plurality of longitudinal slots in and spaced circumferentially around its outer surface, each extending
10 straight without interruption from end to end, said slots being each open at one end to slidably receive a contact member and having lateral edge portions adapted to overlie said members
15 and hold them in place, and flexible contact members in said slots each having a normal width slightly greater than the width of the receiving slot and bent to arcuate form in transverse cross section to present substantial contact surfaces,
20 the side edges of said members resiliently engaging the sides of said slots beneath said edge portions to frictionally hold said members against longitudinal withdrawal from said slots.

25 3. A base for a vacuum device comprising a tubular insulative body having a longitudinal slot in its outer surface extending straight without interruption from end to end, said slot being open at one end to slidably receive a contact member and having lateral edge portions adapted to overlie said member and hold it in place, and a flexible contact member in said slot having

a normal width slightly greater than the width of said slot, the side edges of said member resiliently engaging the sides of said slot beneath said edge portions to frictionally hold said member against longitudinal withdrawal from said slot, said contact member extending beyond the open end of said slot and bent inwardly for connection with a leading-in wire.

4. A base for a vacuum device comprising a tubular insulative body having a plurality of longitudinal slots in and spaced circumferentially around its outer surface, each extending
10 straight without interruption from end to end and open at one end to slidably receive a contact member and having lateral portions adapted to overlie said member and hold it in place, and a flexible contact member in each slot having
15 a normal width slightly greater than the width of said slot and bent so that its side edges resiliently engage the sides of said slot beneath said edge portions to frictionally hold said members against longitudinal withdrawal from said slots, each contact member being longitudinally
20 straight where it lies in its slot and extending beyond the open end of said slot to form a terminal for connection with a leading-in wire.

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