June 20, 1944. A. J. SCHMITT 2,352,126

MOUNTING MEANS

Filed April 15, 1940

Fig. 1

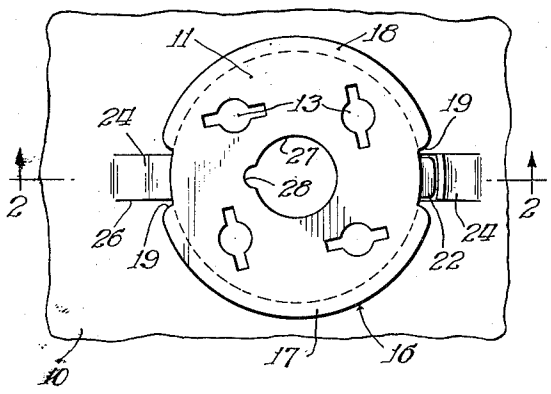


Fig. 4

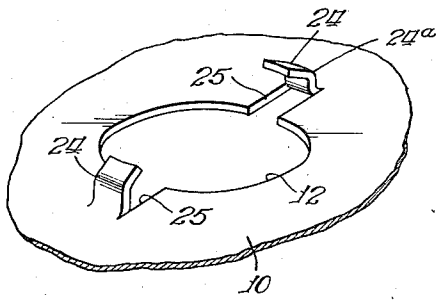


Fig. 2

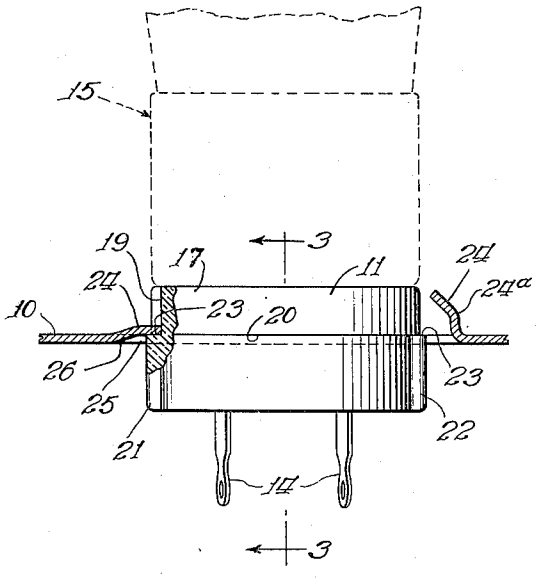
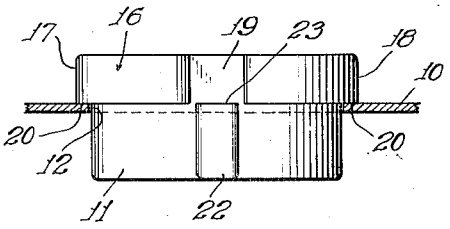


Fig. 3



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Atty

Patented June 20, 1944 2,352,126

UNITED STATES PATENT OFFICE

2,352,126

MOUNTING MEANS

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Application April 15, 1940, Serial No. 329,638

7 Claims. (Cl. 173—339)

This invention relates to mounting means, more particularly in an important aspect thereof as a panel and socket assembly for mounting radio tube sockets directly on the chassis of a radio receiving set, and aims to provide simple and inexpensive but at the same time highly efficient means for this purpose.

As is well known to those skilled in the art, it is commonly desirable to have the socket cylindrical and not only to mount the socket on the panel so as to inhibit axial movement of the socket on the panel but also to fix the relative rotative position of the socket with respect to the panel aperture, and my present invention provides unitary means for both of these purposes integral with the insulating socket body and the metal chassis plate respectively, and without the need for adapter plates, retainer springs, rivets, soldering or other extraneous accessories, thus lending itself readily to mass production methods.

Another and important object of the invention is to provide an improved molded socket for electrical apparatus and one wherein the only metal parts are the ones necessary to ensure the desired electrical connections.

The invention will be understood by reference to the accompanying drawing, forming a part of this specification and showing one embodiment of the invention, in which—

Figure 1 is a plan view of a structure embodying my invention considerably larger than generally actual size;

Figure 2 is an axial section taken on the line 2—2 of Figure 1 but showing parts of the socket in elevation and also showing other parts associated therewith;

Figure 3 is an axial section taken on the line 3—3 of Figure 2, but showing the socket in an elevation and with other parts omitted; and

Figure 4 is a view showing an intermediate structure in the production of the mounting means of my invention, preliminary to the insertion of the body in the aperture.

Referring in detail to the illustrative construction shown in the drawing, the mounting plate 10 here represents say a fragment of a conventional metal chassis panel for commercial radio receiving sets, which are commonly produced in large quantities at low cost and sold at relatively small margins of profit, emphasizing the need for minimizing the material involved and the steps of assembly operation, with, for example, the radio tube socket 11.

The socket 11 is typical of a body to be mounted on the plate 10 in the aperture 12 thereof, and in this instance is a tube socket of a cylindrical molded type, formed advantageously of a dielectric phenolic condensation product material and having the contact openings 13 therein for metallic contacts 14, as shown generally in my Patent No. 2,193,940 of March 19, 1940, these metallic contacts 14 being adapted to engage both mechanically and electrically with the customary prongs (not shown) on the base 15 of a commercial vacuum tube, as need not be here further described.

The cylindrical socket body 11, in accordance with general practice, is of a diameter to be received somewhat snugly in the circular aperture 12 in the chassis 10, in this instance from the upper side of the chassis, and has at its upper end a rim or shoulder portion 16 providing an axially facing shoulder which laps the upper margin of the chassis aperture 12 and thus abuts the chassis to limit downward movement of the socket in the chassis after it has been inserted therein from the upper side thereof, for example, the rim 16 being of greater diameter than the opening 12.

In accordance with the present invention, the upper shoulder portion 16 of the socket is segmentally divided, as here shown, into two circumferentially spaced apart shoulder portions 17 and 18, leaving between them gaps or longitudinal grooves 19 at diametrically opposite sides of the socket and each having an axially facing shoulder 20 which is in a common plane normal to the axis of the body and aperture, intermediate the upper and lower ends of the socket body and which is a plane also common to the upper surface of the chassis panel 10.

Between the shoulder portions 17 and 18 respectively, advantageously at each side, the socket carries another pair of diametrically opposite shoulder portions 21 and 22 axially opposed to the first mentioned shoulder portions 17 and 18; that is, the snoulder portions 21 and 22 on the one hand, and the shoulder portions 17 and 18, on the other hand, extend axially in opposite directions from the plane 20, and the shoulders of the shoulder portions 21 and 22 face in an axial direction opposite to the shoulders of the shoulder portions 17 and 18. In this instance, the shoulder portions or protuberances 21 and 22 have shoulders 23 in a common plane which again is coincident with the plane 20 of the shoulders 17 and 18, and the shoulder portions 21 and 22 are segmentally substantially smaller than the shoulder portions 17 and 18 so that the shoulder portions 21 and 22 are not only axially opposed to

but are circumferentially spaced apart from the shoulder portions 17 and 18 and are of a segmental width just slightly smaller than the gaps 19, and thus the shoulder portions 21 and 22 form a pair of longitudinally extending ribs running from the plane 20 to the lower end of the socket.

Turning again to the chassis and further in accordance with my present invention, the chassis plate 10 has integral detent portions struck out therefrom in the vicinity of the aperture 12 here represented by the tongues 24, the striking out of which at diametrically opposite sides of the opening or aperture 12 provide the diametrically opposed slots 25 or clearance spaces constituting radial extensions opening out of the aperture and just slightly wider than the shoulder portions 21 and 22. In the present embodiment of the invention, these tongues 24 extend radially of the aperture and are initially bent outwardly and upwardly of the chassis plate 10, (which bending slightly shortens the tongues radially, for a purpose next pointed out), and are then bent slightly inwardly.

When, now, the socket 11 is inserted in the aperture 12 for mounting on the chassis, in this case from the upper side of the chassis, the bending of the tongues 24 from the slots 25 permit the shoulder portions 21 and 22 to pass therethrough respectively when in registry therewith until the shoulders 20 of the shoulder portions 17 and 18 abut the chassis plate and lap the margins of the aperture between the slots 25. By making the shoulder portions 21 and 22 just slightly less than the width of the slots 25, and by continuing the shoulder portions 21 and 22 upwardly axially of the socket to intersect the plane of the aperture 12 and in this instance to cause the shoulders 23 of the shoulder portions 21 and 22 to be in a plane coincident with the plane of the shoulders 20 of the upper shoulder portions 17 and 18, the socket when so received in the aperture is locked against rotation. If it were desired to predetermine a single relative rotative position of the socket with respect to the chassis, one of the slots 25, and correspondingly one of the shoulder portions 21 or 22 could be made of a size different from that of the other slot and its corresponding shoulder portion, as will be readily apparent to those skilled in the art.

To secure the fixed axial and rotative position of the socket in the aperture, the tongues 24 may next be moved back substantially to their original positions as best shown at the left-hand sides of Figs. 1 and 2, by bending the tongues back toward the plane of the chassis plate to abut the shoulders 23 of the shoulder portions 21 and 22, which thus constitute stops for the tongues. Since the portions 21 and 22 desirably intersect the plane of the plate, the tongues, as here shown, are not bent strictly to their original position in the plane of the plate, but are slightly elevated therefrom. There is a beneficial frictional reinterlocking of the severed edges of the tongue and plate, however as, say, at 26 adjacent where the tongues are integral with the plate and merge thereinto, which assists in maintaining the tongues in locking position. The slight inward bend given to the tongue as at 24a, after it is initially bent outwardly and upwardly as described, assists the tongue in accommodating itself to its slight elevation in final position.

Furthermore, in the present invention, the tips of the tongues 24 not only abut the shoulders 23 axially but also fit somewhat snugly into the gaps 19 between the shoulder portions 17 and 18 so as to further secure the fixed rotative position of the socket in the chassis, the shoulder portions or protuberances 21 and 22 each engaging an edge of one of the slots or radial extensions 25 respectively, during and after assembly.

As is well known, the tube base 15 may have a central locating pin thereon (not shown) which is received in the central opening 27 of the socket which has a key-way 28 therein receiving a key on the tube pin to predetermine a relative rotative position of the tube with respect to the socket.

Such changes may be made as fall within the scope of the appended claims without departing from the invention.

Having described my invention, I claim:

1. Mounting means including the combination with a chassis plate of a radio receiving set having a circular socket receiving aperture therein and a pair of diametrically opposite slots formed in the margin of said aperture by tongues struck outwardly therefrom and moved axially to the upper side of said aperture, of a cylindrical insulating molded tube socket received in said aperture from the upper side thereof and having a pair of circumferentially spaced apart shoulder portions at the upper end thereof providing a pair of gaps in the margin of the socket at diametrically opposite sides thereof vertically aligned with the chassis slots and of substantially the width thereof, said shoulder portions also providing a pair of axially facing shoulders abutting the upper face of the chassis plate, a pair of longitudinally extending rib-like shoulder portions on said socket extending from the lower end thereof upwardly to a plane coincident with the plane of said axially facing shoulders and providing an additional pair of axially facing shoulders facing in the opposite direction from the first mentioned axially facing shoulders but in a common plane therewith, said rib-like shoulder portions being just slightly narrower than the said slots whereby to pass downwardly thereinto and remaining therein to prevent rotative displacement of the socket in the aperture, said tongues being thereafter bent backward toward the plane of said aperture to abut the shoulders of the rib-like shoulder portions and prevent axial displacement of the socket in the aperture, said tongues being intitially bent intermedially of their length to assist in maintaining the tongues slightly offset upwardly of the plane of the plate whereby the tongues are maintained in the said gaps after being so bent back and thus assist also the rib-like shoulder portions in preventing rotative displacement of the socket in the aperture.

2. Mounting means of the class described including the combination with a plate having a circular body receiving aperture therein and a pair of circumferentially spaced apart slots formed in the margin of said aperture by tongues struck outwardly therefrom and moved axially to the upper side of said aperture, of a cylindrical insulating molded body received in said aperture from the upper side thereof and having a pair of longitudinally extending rib-like shoulder portions received substantially snugly in said slots, said tongues being thereafter moved toward their original position to axially abut said shoulder portions, and other segmental circumferentially spaced apart shoulder portions on the body of each side of said rib-like shoulder portions and providing axially facing shoulders abutting the upper margin of said aperture, said tongues be-

ing maintained by said rib-like shoulder portions somewhat snugly between said circumferentially spaced apart shoulder portions, whereby the body is held both axially and rotatively.

3. A panel and socket assembly comprising a panel having a circular opening therein and a tongue leading to said opening, said tongue being displaceable from the plane of said panel to provide a clearance space constituting a radial extension of said opening, a socket comprising a body portion having a protuberance thereon and adapted to be entered into said opening when said protuberance is in register with said clearance space, a rim on said socket comprising a shoulder upon which said socket is supported in said opening and a groove longitudinally disposed in said rim into which the tip of said tongue is adapted to be pressed when said tongue is urged toward the plane of said panel, said protuberance engaging an edge of said radial extension to inhibit rotary displacement of said socket within said opening during and after assembly.

4. The invention as set forth in claim 3 and wherein the protuberance on the body of said socket terminates substantially in the plane of the surface of the shoulder upon which said socket is supported and comprises a stop for said tongue to prevent said tongue tip being depressed below said plane of said shoulder surface when said tongue is urged toward the plane of said panel.

5. A panel and socket combination comprising a panel having an opening therein and a plurality of oppositely located integral tongues leading to and terminating in said opening, said tongues being displaceable from the plane of said panel to provide a plurality of oppositely located clearance spaces constituting radial extensions of said opening, a socket comprising a body portion having a plurality of oppositely located protuberances thereon and adapted to be entered into said opening when said protuberances are in register with said clearance spaces, a rim on said socket of a diameter greater than that of said opening and comprising a shoulder upon which said socket is supported in said opening, and grooves longitudinally disposed in said rim into which the tips of said oppositely located tongues, respectively, are adapted to be pressed when said tongues are urged toward the plane of said panel, said protuberances being disposed, respectively, in alignment with said grooves and extending upward toward the plane of said shoulder a distance at least sufficient to insure that portions of said protuberances engage complementary portions of said radial extensions of said openings when said shoulder engages said panel around said opening in assembled relation therewith.

6. A panel and socket assembly comprising a panel having an opening therein and a tongue leading to said opening, said tongue being displaceable from the plane of said panel to provide a clearance space constituting a radial extension of said opening, a socket comprising a body portion having a protuberance thereon and adapted to be entered into said opening when said protuberance is in register with said clearance space, a rim on said socket comprising a shoulder by which said socket abuts the margin of said opening, said protuberance engaging an edge of said radial extension to inhibit rotary displacement of said socket within said opening during and after assembly, and a groove longitudinally disposed in said rim into which the tip of said tongue is adapted to be pressed when said tongue is urged toward the plane of said panel to engage the socket to maintain said assembly.

7. In mounting means of the class described for a panel and body assembly embodying a panel having an opening therein and a pair of tongues leading to said opening, said tongues being displaceable from the plane of said panel to provide a plurality of oppositely located clearance spaces constituting radial extensions of said opening, the combination comprising a cylindrical body adapted to be inserted in said opening, a pair of circumferentially spaced apart shoulder portions on the body having shoulders in a common plane normal to the axis of the body and intermediate the ends of the body, said spaced apart shoulder portions being adapted to abut said panel and providing a pair of gaps therebetween at opposite sides of the body, and a second pair of shoulder portions on the body offset from the first mentioned shoulder portions and extending in the opposite direction on said body from said first mentioned shoulder portions and aligned with said gaps, said second shoulder portions being adapted to register with said clearance spaces and having shoulders axially opposed to the shoulders of said first mentioned shoulder portions but substantially in the plane of the said shoulders of said first mentioned shoulder portions, whereby the tongues may be pressed against the shoulders of said second shoulder portions and the said second shoulder portions may engage the edges of said radial extensions to retain the body in position on the panel.

ARTHUR J. SCHMITT.

CERTIFICATE OF CORRECTION.

Patent No. 2,352,126. June 20, 1944.

ARTHUR J. SCHMITT.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 48, claim 1, for "backward" read --back--; line 72, claim 2, for "of" read --on--; page 3, first column, line 36, claim 5, for "in" read --at--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22nd day of August, A. D. 1944.

Leslie Frazer

(Seal) Acting Commissioner of Patents.