July 21, 1953 S. M. DEL CAMP 2,646,460

TUBE SHIELD AND SOCKET MOUNTING ASSEMBLY

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FIG. 1.

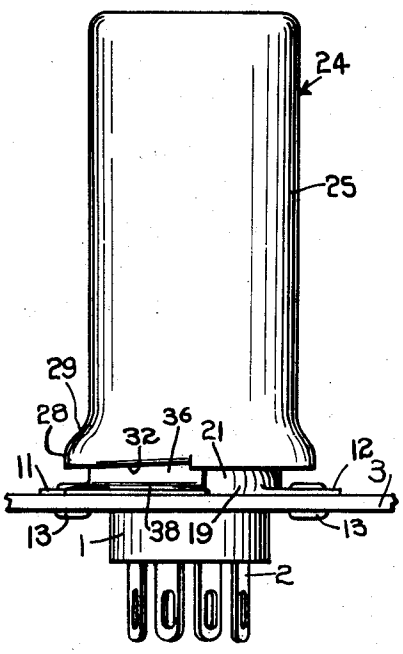


FIG. 2.

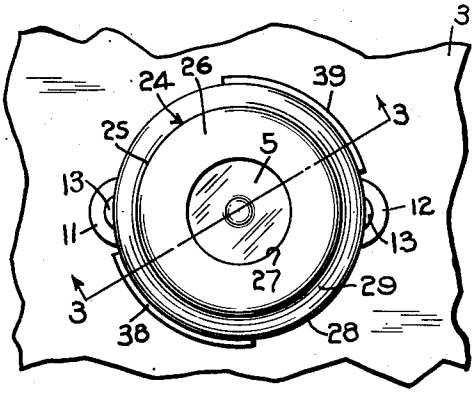
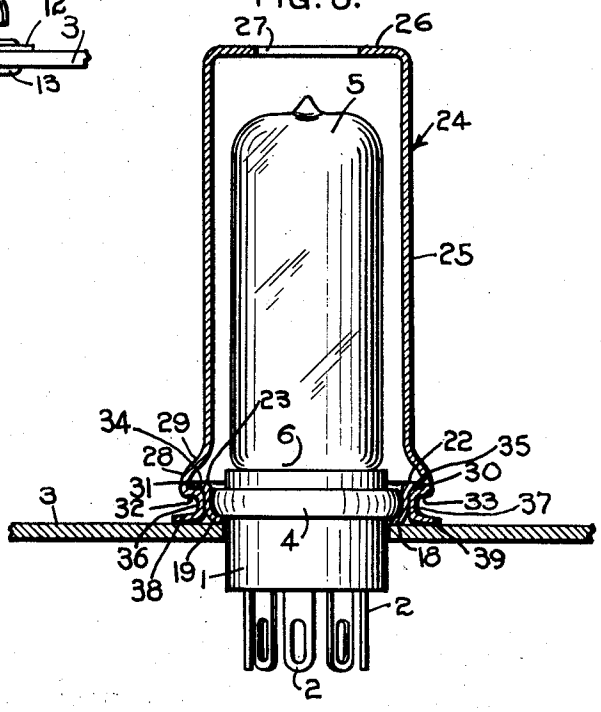


FIG. 3.



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FIG. 4.

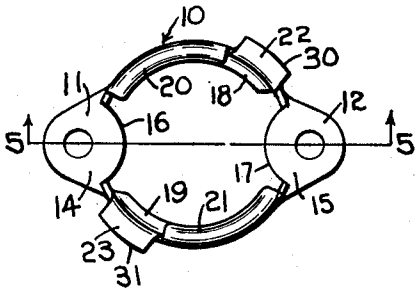


FIG. 5.

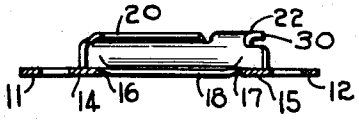


FIG. 6.

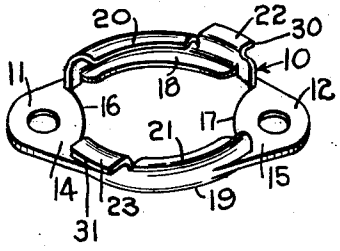


FIG. 7.

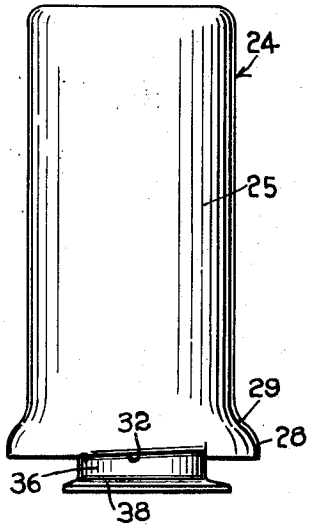


FIG. 8.

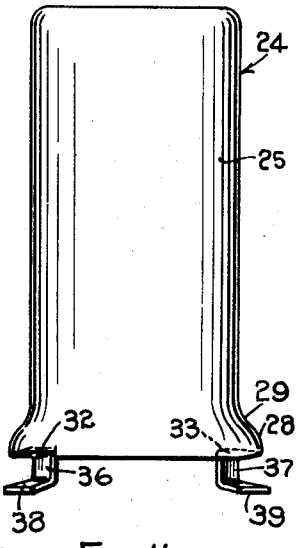


FIG. 9

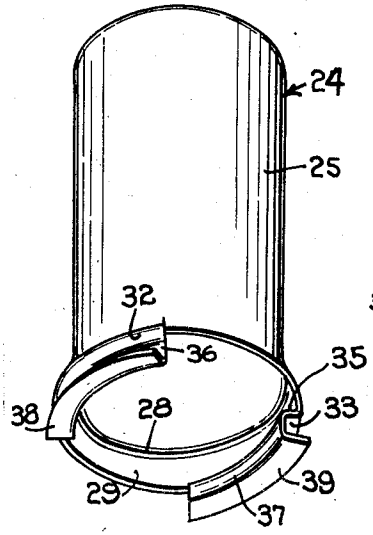


FIG. 10.

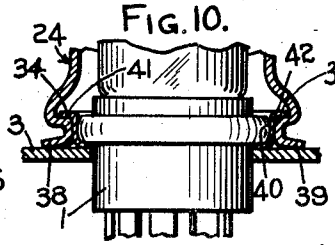
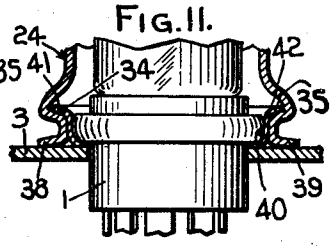


FIG. 11.



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Patented July 21, 1953

2,646,460

UNITED STATES PATENT OFFICE

2,646,460

TUBE SHIELD AND SOCKET MOUNTING ASSEMBLY

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Application May 26, 1950, Serial No. 164,543

5 Claims. (Cl. 174—35)

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The present invention relates to tube shield and socket mountings, and more particularly to shields and tube socket mountings for miniature tube base sockets commonly used in radio and like apparatus, and aims to improve existing devices of this type. A primary object of the invention is the provision of an improved tube shield and socket mounting construction, which may be quickly and easily assembled and positively held in assembled relation.

A further object of the invention is the provision of an improved tube shield device which may be removably assembled with a cooperating socket mounting member and support and positively held thereon against accidental dislodgment therefrom by tensioned frictional engagement with the socket mounting member and a support.

A still further object of the invention is the provision of improved means for assembling a tube shield with a cooperating socket mounting member and support and for positively maintaining the shield in assembled position against accidental dislodgment due to vibration and the like.

These and other objects and advantages of the invention will be apparent to those skilled in the art from a consideration of the accompanying drawing and annexed specification illustrating and describing preferred embodiments of the invention.

In the drawings:

Fig. 1 is a side elevation showing a preferred device mounted on a support;

Fig. 2 is a top plan view of the device of Fig. 1;

Fig. 3 is a vertical cross-sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a top plan view of the socket mounting;

Fig. 5 is a vertical sectional view taken on the line 5—5 of Fig. 4;

Fig. 6 is a perspective view of the socket mounting;

Fig. 7 is a front elevational view of the tube shield;

Fig. 8 is a side elevational view of the tube shield;

Fig. 9 is a perspective view of the tube shield;

Fig. 10 is a fragmentary vertical cross-sectional view of a modified assembly showing the tube shield in one rotative position relative to the socket mounting; and

Fig. 11 is a view similar to Fig. 10, but showing the tube shield in final rotative position relative to the socket mounting.

Referring to the drawings, the tube socket may

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be of any suitable construction commonly employed for the reception and mounting of pronged tubes and advantageously embodies a body portion 1 of suitable insulating material provided with a series of prong-receiving openings in which are fitted metal contacts having integral wiring terminals 2 extending from the socket. The socket body 1 conveniently is formed with diametrically opposed arcuate recesses for receiving a part of the mounting so as to accurately position the socket in a chassis or suitable support 3. Preferably the side of the socket body 1 is formed with a peripheral bead or annular rim 4 (Fig. 3) presenting a flange for engagement with a part of the mounting as will later be described.

The contacts carried by the socket 1 are designed to support and make electrical contact with a suitable tube 5 which may have a base 6 and a series of prong terminal contacts for insertion in the socket openings, as is usual in the art. The socket member, comprising the body 1, contacts and wiring terminals 2, is preferably pre-assembled with the mounting member so that the two may be applied to the chassis as a unit.

The mounting member for the socket is advantageously formed of metal and preferably from a single stamping of very thin sheet metal and suitably comprises a ring-like body 10 (Fig. 4) of suitable shape to conform to and receive the socket body 1. The ring-like body 10 is preferably provided with suitable means for attaching the unit to the support or chassis 3, such as laterally extending ears 11 and 12 disposed in a plane at right angles to the axis of the body, and apertured to receive suitable fastening means such as the rivets 13, screws or the like. At their inner ends the ears 11 and 12 are provided with inwardly extending projections 14 and 15 (Figs. 4, 5 and 6) having convexly curved terminal edges 16 and 17 for engagement with the diametrically opposed arcuate recesses of the socket body 1.

The lower peripheral edge of the body member 10 intermediate the projections 14 and 15 are inwardly flanged as at 18 and 19 to provide shoulders for engagement with the under face of the socket rim 4 and thus limit movement of the socket 1 in one direction in the member 10. The socket is advantageously retained in this position of limited movement by inwardly turned flanged portions 20 and 21 at the top of the ring-shaped body member 10 which engage the upper face of the socket rim 4. Adjacent the flanged portions 20 and 21 the body member 10 is provided with outwardly extending oppositely positioned locking ears or tongues 22 and 23 for en-

gagement with cooperating cam surfaces of the tube shield as will hereinafter be described.

The socket member 1 is thus fixedly retained in the chassis or support 3 by the mounting member and in a position such that the upper portion of the socket body extends above the locking ears 22 and 23 for engagement with the prongs of the tube 5 and the lower portion thereof extends below the chassis or support 3.

In accordance with the invention the tube shield 24 is advantageously formed of metal and preferably from a single stamping of thin sheet metal and suitably comprises a tubular body portion 25 of a diameter and length to enclose and shield the tube 5 and having an inwardly extending flange 26 at its upper end defining a central opening 27.

Adjacent its lower end the tubular body portion is provided with an enlarged annular flange 28 connected with the tubular body portion 25 by an outwardly curved or flared portion 29. The annular flanged portion 28 is of a diameter to fit over and snugly receive the outer curved edges 30 and 31 of the locking ears 22 and 23 to assist in correctly positioning the tube shield on the mounting member preparatory to securing it in mounted position.

At the lower edge thereof the annular flange 28 is provided with inwardly extending oppositely disposed cam flanges 32 and 33 having upper cam surfaces 34 and 35 adapted for engagement with the under surfaces of the locking ears 22 and 23. The cam flanges 32 and 33 and the cam surfaces 34 and 35 thereof are preferably inclined slightly with respect to the plane of the chassis or support 3 in a direction such that the portions of the cam surface which initially engage the locking ears 22 and 23 are somewhat closer to the chassis or support than the portions which subsequently engage them. Thus, as the tube shield 24 is rotated in a clockwise direction, as viewed in Fig. 2, the locking ears 22 and 23 exert a gradually increasing downward pressure on the cam surfaces 34 and 35 thereby urging the tube shield downwardly against the restraining action of a pair of resilient curved leg portions 36 and 37 having support-engaging flanges 38 and 39.

The curved leg portions 36 and 37 extend downwardly preferably from the inner edges of the flanges 32 and 33 and preferably resiliently engage the outer peripheral surface portions of the ring-like body 10. The support-engaging flanges 38 and 39 extend outwardly from the lower extremities of the leg portions 36 and 37 for engagement with the support 3 and are preferably inclined downwardly at a slight angle thereto so that initial contact therewith is made by the peripheral edge portions of the flanges.

Thus as the tube shield 24 is rotated in a clockwise direction on the body member 10 and is urged downwardly by the ears 22 and 23 acting on the cam surfaces 34 and 35, such downward movement causes the flanges 38 and 39 to pivot downwardly about the lines of contact of their outer edges with the support 3 and may also effect a slight spreading or outward flaring of the leg portions 36 and 37. Since the leg portions 36 and 37 and the flanges 38 and 39 are formed of resilient material such bending or deformation sets up strains in the metal resulting in an upwardly acting force which urges the cam surfaces 34 and 35 against the ears 22 and 23 to firmly and tightly secure the tube shield in position.

In mounting the device the socket member, comprising the body 1 and contacts and wiring terminals 2, is preferably pre-assembled with the mounting member and the two applied to the chassis as a unit. The tube is then inserted in the socket and the tube shield mounted thereover.

The tube shield 24 is mounted by first placing it over the tube 5 with the cam flanges 32 and 33 and leg portions 36 and 37 positioned between the locking ears 22 and 23 and the attaching ears 11 and 12 and with the outer peripheral edges of the support-engaging flanges 38 and 39 resting against the support. The tube shield is then rotated in a clockwise direction until the leading edges of the support-engaging flanges 38 and 39 contact the adjacent edges of the locking ears 22 and 23, the latter acting as stops to limit further turning movement. The tube shield is now securely locked in mounted position and maintained therein by the tension in the leg portions 36 and 37 and the flanges 38 and 39 produced when the tube shield is moved downwardly by the ears 22 and 23 acting on the cam surfaces 34 and 35. This tension causes a tight frictional engagement between the ears 22 and 23 and the cam surfaces 34 and 35 which is sufficient to maintain the shield in fixed position when under the most adverse conditions of use. To remove the tube shield it is merely necessary to rotate it in a counter-clockwise direction until the cam surfaces 34 and 35 clear the ears 22 and 23 and then lift it upwardly away from the support.

In the modified form of invention illustrated in Figs. 10 and 11, the tube shield 24 may be of the same form as that described in connection with the preferred invention. The socket mounting 40, however, differs from the socket mounting 10 of the preferred invention by providing locking ears 41 and 42 which are formed of resilient material and which yield during the turning movement by which the tube shield is assembled with the mounting 40 and support 3. The quality of yieldability in the ears 41 and 42 is preferably provided by forming the socket mounting 10 of slightly thinner material than the shield 24. As a result, when the cam surfaces 34 and 35 of the tube shield 24 are initially engaged with the ears 41 and 42, the flanges 38 and 39 are in contact with the support 3. As the tube shield is rotated in a clockwise direction on the mounting 40, the cam surfaces 34 and 35 exert forces on the weaker ears 41 and 42 forcing them in an upwardly direction. The inherent tendency of the ears 41 and 42 to return to normal position urges the flanges 38 and 39 of the shield 24 into firm contact with the support 3 and an efficient shielding assembly results.

It will thus be seen that the present invention provides a relatively simple and inexpensive tube shield socket mounting which is readily assembled and positively and securely held in mounted position.

Although I have illustrated and described a preferred embodiment of the invention, I do not intend to be limited to the specific details thereof as the scope of the invention is best defined in the appended claims.

I claim:

1. In a tube mounting and shielding device a socket mounting member adapted to mount a socket on a support, locking ears secured to said mounting member, a tube shield adapted to be

assembled with said mounting member, cam flanges attached to said tube shield and positioned for sliding frictional engagement with the under surfaces of said locking ears upon rotation of the tube shield, and resilient leg portions depending from said cam flanges and engageable with a support when said tube shield is rotated, said resilient leg portions exerting an upward component of force on said tube shield to maintain said cam flanges in tight frictional engagement with said locking ears.

2. A tube shield and socket mounting assembly comprising a socket mounting member having opposite disposed locking ears, means for attaching said socket mounting member to a support, a tube shield adapted to be assembled with said mounting member and having a tubular portion provided with a flared portion adjacent one end thereof, cam flanges integral with said flared portion and having cam surfaces slidably engageable with said locking ears, said cam surfaces being inclined with respect to a support to which the device may be attached whereby relative sliding movement of said locking ears and cam surfaces causes the tube shield to move toward the support, and resilient leg portions connected with said cam flanges and adapted to tensionally engage said support during such movement.

3. A tube shield and socket mounting assembly comprising a socket mounting member having a projecting locking element, means for attaching said socket mounting member to a support, a tube shield adapted to be assembled with said mounting member comprising a tubular member having a cam flange integrally joined to its lower end and extending inwardly therefrom, a leg element extending from said cam flange for engagement with a support, said cam flange being engageable with the under surface of said locking element upon rotation of the tube shield to urge said shield toward said support, and one of said elements being resilient so that said shield tensionally engages said support.

4. A tube shield and socket mounting assembly comprising a socket mounting member having a projecting resilient locking ear, means for

attaching said socket mounting member to a support, a tube shield adapted to be assembled with said mounting member comprising a tubular member having a cam flange integrally joined to its lower end and extending inwardly therefrom, a leg element extending from said cam flange for engagement with a support, said cam flange being engageable with the under surface of said locking element upon rotation of the tube shield to urge said shield toward said support, said resilient locking ear exerting a downward component of force on said tube shield to maintain said cam flange in tight frictional engagement therewith.

5. A tube shield and socket mounting assembly comprising a socket mounting member having a projecting locking element, means for attaching said socket mounting member to a support, a tube shield adapted to be assembled with said mounting member comprising a tubular member having a cam flange integrally joined to its lower end and extending inwardly therefrom, a tensioning element depending from said cam flange, said cam flange being engageable with the under surface of said locking element upon rotation of the tube shield to urge said shield toward said support and said tensioning element having a resilient flange element integral with the outer end thereof, said flange element being adapted to engage tensionally said support thereby exerting an upward component of force on said tube shield to maintain said cam flange in tight frictional engagement with said locking element.

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