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VACUUM TUBE LOCK

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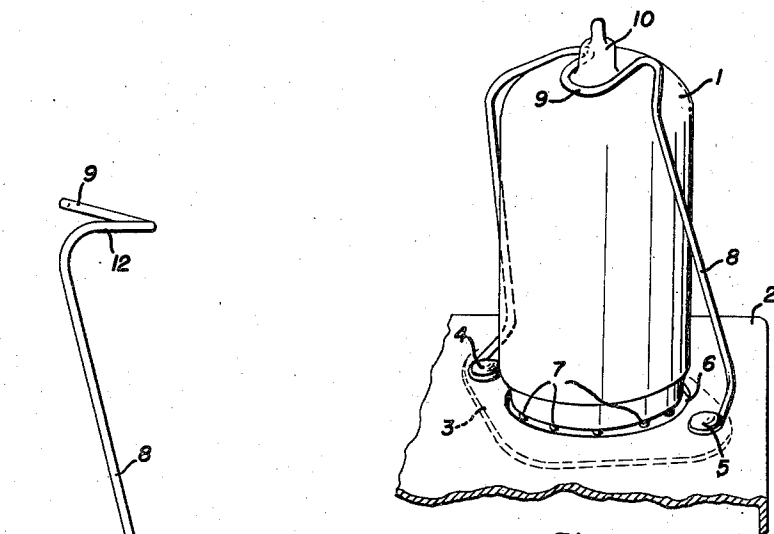


Fig. 1

Fig. 2

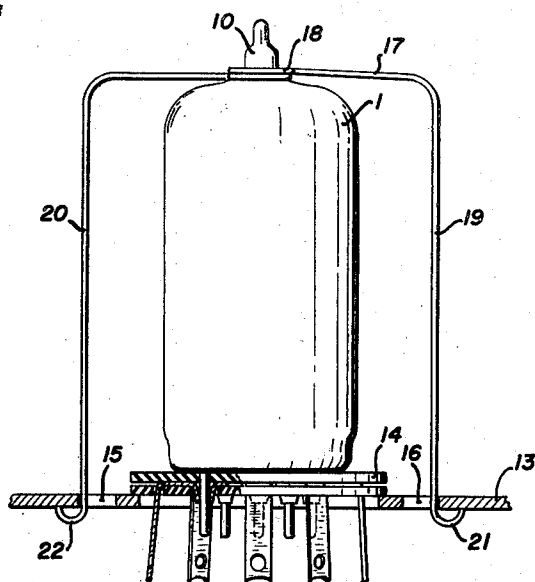


Fig. 3

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VACUUM TUBE LOCK

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1 Claim. (Cl. 250—27.5)

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This invention relates to vacuum tubes and particularly to arrangements for supporting them securely.

Vacuum tubes are commonly provided with pin connections which fit into sockets. Difficulty has been experienced, where the apparatus incorporating such vacuum tubes is subject to vibration, with the pin connections loosening from the socket. Arrangements have been devised whereby special shaped connection pins or posts on the tube lock into the socket to prevent separation of the tube and its socket.

With the advent of extremely small vacuum tubes of the type in which no special base is provided and in which the pins are merely extensions, through a glass wall of the vessel, of the electrode supporting posts, it has become more difficult to lock together the vacuum tube connecting or supporting pins and the socket. The problem is made particularly difficult in that the sockets are very small.

It is an object of the present invention to provide a new and improved arrangement for retaining such a vacuum tube securely in its socket.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claim. The present invention itself, both as to its organization and manner of operation, together with further objects and advantages thereof may best be understood by reference to the following description taken in connection with accompanying drawings in which:

Figure 1 illustrates apparatus in perspective embodying one form of the invention;

Figure 2 is a view partly in section and partly in elevation of a part of the apparatus shown in Figure 1; and

Figure 3 illustrates other apparatus embodying another form of the invention.

In Figure 1 a vacuum tube 1 having the conventional glass enclosure member, is mounted on a chassis 2 underneath which a wafer-type socket 3 of the conventional type illustrated in dotted line, is fastened by means of rivets 4 and 5. A hole 6 through the chassis 2 above the socket 3 provides an opening through which the pins 7 at the base of tube 1 may extend into the appropriate openings and contacts of socket 3. A resilient wire 8 is fastened at one end under the rivet 5 and at the other end under the rivet 4, and is so shaped as to bias an intermediate U-shaped portion 9 over the top of the vacuum tube 1 to lie in engagement with tube 1 around the closed ex-

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haust tubulation 10 to resiliently press the tube 1 downwardly in Figure 1.

In order to remove the tube 1 from its socket 3, the U-shaped part 9 of the resilient wire 8 is pulled away from the tube 1, and the tube 1 is then pulled upwardly out of its socket. To replace the tube 1, the U-shaped part 9 of the resilient wire 8 is again pulled away from its normal position over the socket 3 and the tube 1 is pushed into socket 3 in proper position, the U-shaped part 9 being allowed thereafter to spring back over the top of tube 1 around the tubulation 10.

Since the wire 8 is resilient it would require a shock or jar force greater than that which would break the glass enclosure member of the vacuum tube 1 to move the wire 8 from engagement with the top of tube 1. Of course, the force applied to the glass enclosure member of tube 1 in the process of applying the wire 8 thereto is smaller than that force necessary to break the glass enclosure member.

In Figure 2, the parts shown are identical with similar parts in Figure 1 and are given like reference numerals. Wire 8 is shown fastened to the upper surface of chassis 2 by the upper head of rivet 5, and the wafer socket 3 is fastened to the lower surface of chassis 2 by the washer 11 held in place by the lower head of rivet 5.

Because the top of the glass vessel of vacuum tube 1 is dome-shaped, the U-shaped part 9 of resilient wire 8 is made to slant upwardly, as illustrated in Figure 2, from the adjacent horizontal leg 12 of wire 8 which overlies a side part of the domed top of vacuum tube 1. By this configuration, the wire 8 lies in close contact with the upper part of the vacuum tube 1, and distributes its force more evenly to require a relatively weak wire 8 and to reduce the possibility of breakage.

In the modified arrangement shown in Figure 3, the vacuum tube 1 is illustrated as mounted on a chassis 13 on the upper surface of which a wafer-socket 14 is fastened. Holes 15 and 16 are formed through the chassis 13 on opposite sides of the wafer-socket 14. A resilient wire 17 is provided centrally with a loop 18 of such size as to fit snugly over the tubulation 10 on the top of vacuum tube 1. The wire 17 also has extended resilient ends 19 and 20 bent downwardly and outwardly at distances from the loop 18 greater than the diameter of vacuum tube 1 to extend respectively through the holes 16 and 15. The lower end of leg 19 is formed as a hook 21 which resiliently engages the undersurface of the chassis 13, and similarly the lower end of the leg 20 of

wire 17 is formed as a hook 22 which likewise resiliently engages the lower surface of chassis 13 to prevent the wire 17 and vacuum tube 1 from moving away from the chassis 13 and to resiliently press the tube 1 downwardly in a manner similar to the arrangement shown in Figure 1.

To disengage the tube 1 from chassis 13, the legs 19 and 20 are forced slightly toward each other until the hoops 21, 22 are substantially in register respectively with apertures 16, 15 in chassis 13, and are then pulled upwardly away from chassis 13 so that the bent ends 20 and 21 pass through holes 16 and 15 respectively. The loop 18 may then be taken off tubulation 10 of the tube 1. Thereafter, the tube may be removed from socket 14.

With the tube 1 in place in socket 14, to replace the retaining member 17, the legs 19 and 20 are pressed slightly toward each other, and the ends 21 and 22 are inserted through holes 16 and 15 in chassis 13 respectively, while at the same time loop 18 is passed over tubulation 10 and then legs 19 and 20 are released so that they tend to assume their normal position. When the legs 19 and 20 are released, the bent ends 21 and 22 of the spring wire 17 again engage the undersurface of chassis 13 and prevent tube 1 from moving out of socket 14.

Because of the greater ease in withdrawal or replacement of the tube 1, and also because the spring 18 cannot be lost when removed, the arrangement of Figure 1 is preferred. However, the arrangement of Figure 3 has the advantage that the holes 15 and 16 may be formed by a simple stamping operation in chassis 13 at the same time as the hole for socket 14 is formed, and, since the wire 17 is very economical to manufacture, and the assembly operation but little more time consuming than that required for the arrangement of Figure 1, the arrangement of Figure 3 may be preferred for certain purposes.

While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention in its broader aspects,

and, therefore, the aim in the appended claim is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

I claim:

A chassis for a radio set comprising, a vacuum tube socket mounted in said chassis for engaging a vacuum tube having a tubulation extending therefrom, a resilient elongated member of single-piece spring wire construction having opposite ends adjacent said chassis on opposite sides of said socket, means fastening rigidly each of said opposite ends to said chassis, said means also fastening said socket to said chassis, said member having an intermediate resilient part extending above said socket, said intermediate part having a W-shaped portion pressed by the resilience of said member over the top of a tube mounted in said socket with the center opening of the W-shaped portion extending partly around said tubulation, the center apex of the W-shaped portion lying substantially further from said socket than the side legs thereof, said resilient member thus pressing said W-shaped portion over the top of a tube in said socket to engage the tubulation of said tube in the center apex of said W-shaped portion to thereby prevent disengagement of said tube and socket by shock and vibration forces, whereby the side legs of said W-shaped portion tend to snap over the top of said tube in said socket and yet are easily moved aside for easy insertion and removal of a tube from said socket.

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