

Sept. 8, 1942.

H. H. EBY

2,294,896

THERMIONIC TUBE SOCKET

Original Filed June 16, 1937

Fig. 3.

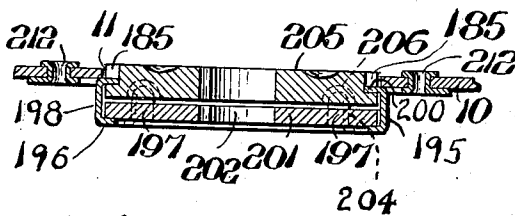


Fig. 4.

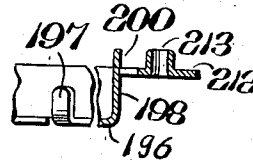


Fig. 5.

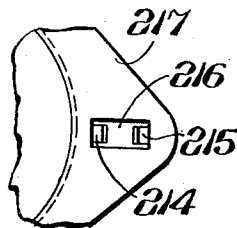


Fig. 8.

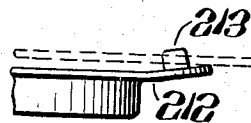


Fig. 6.

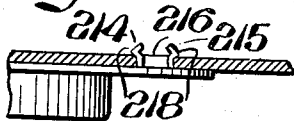


Fig. 9.

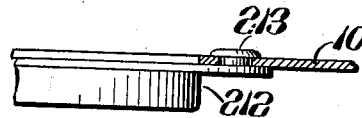


Fig. 7.

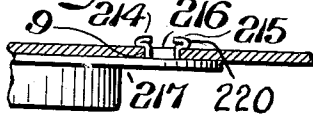


Fig. 2.

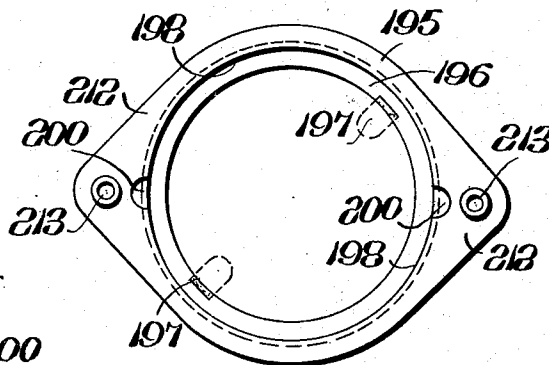
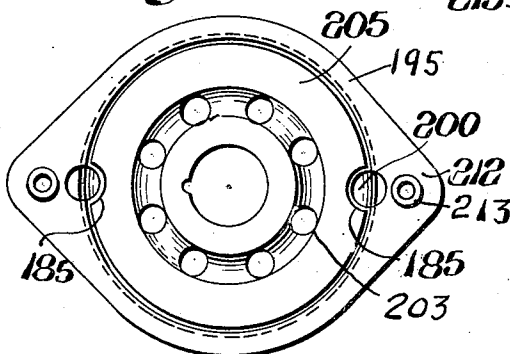


Fig. 1.



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UNITED STATES PATENT OFFICE

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THERMIONIC TUBE SOCKET

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Original application June 16, 1937, Serial No. 148,546. Divided and this application December 18, 1940, Serial No. 370,640

2 Claims. (Cl. 173-339)

This application is a division of my application filed June 16, 1937, Serial No. 148,546, now Patent No. 2,259,157, issued October 14, 1941.

This invention relates to thermionic tube sockets, and particularly to receptacles for radio tubes.

The general theoretical requirements for such devices are well known and include uniform and low contact resistance, uniform and tight prong engagement, strength, attractiveness of appearance, as an attribute of sales appeal at least, even if mechanically of small moment, and extreme economy in production cost. This latter manifests itself in susceptibility to mass production, in the reduction in amount and expense of material used, and, of probably greatest moment, in reduced labor costs. Other advantageous attributes include easy and cheap installation, susceptibility of the receptacle to changed contact relation, ease of attachment of the connectors, etc.

It is among the objects of this invention; to secure each one of the foregoing advantages in socket receptacles; to provide a radio socket receiving housing, for mounting the sockets on a panel, of novelty and high utility; to provide a socket housing in which either a laminated or molded socket receptacle is interchangeably mountable; to improve molded sockets; to improve laminated sockets; to improve contacts for receptacles; to provide a metal stamping in which parts have a snap or push fit to assemble a complete socket without eyeletting or riveting and with a minimum of labor; to improve radio socket contacts; to provide improvements on my earlier filed applications Ser. Nos. 25,369 matured into Patent #2,127,556 August 23, 1938, and 25,055 matured into Patent No. 2,196,697 April 9, 1940; to provide a radio tube socket and mounting plate so arranged that after positioning the plate on a chassis the socket can be removed, either in whole or in part, to rotate it for variation of indexing; and many other objects and advantages as will become more apparent as the description proceeds.

In the preferred embodiment of the invention a metal stamping is providing as the mounting support for the socket, within which a socket device is mounted, there being cooperating portions of socket and stamping to anchor the socket within the stamping.

In the accompanying drawing forming part of this description;

Fig. 1 represents a plan of a modified form of pan and two part base.

Fig. 2 represents a plan of the modified form of pan used in Fig. 1.

Fig. 3 represents a transverse vertical section through the form of pan and plate assembly of Fig. 1.

Fig. 4 represents a fragmentary section through the pan of the assembly of Fig. 3 showing the integral eyelet formed therewith.

Fig. 5 represents a fragmentary plan of a modified form of pan, having integral panel mounting anchoring means,

Figs. 6 and 7 represent fragmentary sections partially in elevation of the fastening means of Fig. 5, in two stages of anchoring,

Fig. 8 represents a modified form of pan mounting assembly,

Fig. 9 represents a further modified form of mounting.

An important factor in the invention is the facilitation of under panel or over panel mounting, and some preliminary consideration may be given to this part of the development. The panel of a radio receiving chassis, of suitable material, is provided with an aperture, usually circular, within which the socket receptacle is to be disposed. An annular opening is not necessary as oval, square, or any other desired contour may be provided, according to the particular demands. The radio socket receptacle is to be mounted either directly in the aperture, supported by the edges of the panel surrounding the aperture, as will later be discussed, or by means of a sub-surface support will be mounted on the panel in alignment with the aperture.

The preferred form of sub-surface support forming an important part of this invention comprises a metal stamping or socket mounting, having an upper substantially plane face, merging into a substantially cylindrical wall. The short flange surrounding the annular aperture merges into the cylindrical wall, and completes the stamping. Obviously the sizes and shapes of the various parts just recited will be changed in accordance with conditions and demands. Under certain conditions, for instance, the flange will be extended to form a substantially closed lower floor within which the radio tube receptacle will be disposed, depending upon the height of the side wall, among other things, or it may be cut away to form mere supporting legs in place of the complete flange shown. Various forms of modified flanges will be discussed later herein. The elemental complete flange which is sometimes preferred is shown. The upper surface preferably has two diametrically opposed securing ear portions. The stamping, cage, mounting support, or pan, is preferably formed of resilient sheet metal, although molded metal or insulating materials may be used. The mounting support or supporting frame is obviously a cheap and relatively inexpensive item, using a minimum of material and labor in its production.

It being desired to mount radio socket receptacles within the supporting pan easily and

cheaply, it is desired to provide some means for facilitating the entry of the sockets, while acting to anchor the parts securely against undesired withdrawal after positioning. While it will be evident that if desired suitably independent fastening means, such as staples, eyelets, screws, bolts and the like may be resorted to in securing the broader advantages of the pan support, yet this is not preferred, and it is preferred to so form the pan that automatic locking assembly follows the mere association of the elements.

It will be recognized that in its broader aspects it makes no particular difference what sort of radio socket is associated with the metal stamping or mounting frame, whether molded as described, or molded in part and laminated in part, or whether it comprises two insulating sheets of elements including the type normally called "laminated."

The utilization of portions of the flange of the pan for indexing purposes is carried further forward in the disclosure of Figs. 1, 2, etc. The pan 195 has the flange 196 to which is attached the more or less elongated tongues 197 bent upwardly to substantial parallelism with the vertical wall 198 of the pan, and of which there are at least one, and preferably a pair, disposed diametrically opposite to each other. The locking ears 200 of the construction previously described, or comprised of any of the resilient locking devices alternatively proposed, are formed in the pan in position to engage the socket to be described.

The lower plate 201 of the socket has the enlarged central guide aperture 202, so large as to be out of contact with the guide stud on the radio tube to be inserted, and the plurality of the contact apertures 203 disposed in a concentric circle about the guide aperture. The plate 201 has a plurality, preferably, of recesses 204 in its periphery, and is of proper size and shape to fit in the pan 195 with the upstanding studs or tongues 197 disposed in selected recesses 204. The upper molded plate 205 include the anchoring recesses 185. On the lower surface of the plate there may be formed shallow ribs or radial barriers between contact apertures 203. The lower surface is also provided with a plurality of wells or perpendicular apertures 206 and extending deep enough into the upper plate to receive the extremity of the upstanding lug on the flange. The mode of assembly of the socket and stamping support includes the mounting of the contacts in either plate, the association of the other plate therewith and the deposition of the whole, or successive parts, in the housing or pan, with the vertical lugs on the flange indexing both plates and preventing relative rotative motion of the plates as will be clear. The ears 200 anchor the whole in the pan.

In the discussions that have taken place heretofore the emphasis has been upon the assembly of the socket proper, and the details of the components thereof, and it has been assumed, and even suggested that the ultimate chassis engagement will be by conventional means. However, in the interest of economy, and the facilitation of mounting of the sockets on the chassis, and especially to facilitate sub-assembly mounting, any of the metal stampings shown may be modified in accordance with the disclosure of Figs. 2, etc., to provide integral attaching means.

Thus, in the formation of the stamping the metal of the attaching ear 212 of the pan, or other supporting element, is drawn to form the integral more or less elongated cylindrical stud or eyelet 213 capable of passing through the eyelet aperture in the chassis panel 10. It is frequently desirable to effect a sub-assembly mounting in which the socket is mounted in the panel temporarily so as to be available for eventual anchoring by eyeletting operations. This integral securing element just described facilitates this, either by providing a resilient bulge or the like to the cylinder so as to secure frictional mounting and engagement in the panel aperture, or by the modification shown in Fig. 8. In this form of the invention the attaching ear 212 carrying the integral attaching cylinder 213 is given an initial flare or bend out of the plane of the socket, in either direction but preferably upwardly. The subassembly mounting requires pressure on the socket to bend the attaching ear to a position of substantial planarity, or at least until the integral cylinder mounted thereon is straightened out sufficiently as to align with the aperture in the panel 10 to permit entry therein. Release permits the resilience of the attaching ears to assert itself to spring out of the plane of the socket to a degree such as to insure a good frictional engagement laterally between the integral stub eyelet or cylinder, which will hold the socket in place until the final complete anchoring step of upsetting or turning over the end of the eyelet on the other side of the panel as shown in Fig. 3.

A modification of this feature is shown in Figs. 5, 6 and 7. In this form the metal is not drawn to form the cylinder of Fig. 2, but is struck out in the form of a pair of spaced tongues 214 and 215 extending vertically at opposite ends of a slot or opening 216 in the attaching ear 217. Either or both tongues may be given a curvature or resilient bulge 218 which serves a dual purpose by guiding the tongue through the panel opening and engaging frictionally the surface of the panel adjacent to the opening 9, and also serves to start the bend so that upsetting or punching causes the tongue to bend upon itself, as shown at 220, to anchor the socket.

I claim:

1. A radio tube socket supporting element comprising an integral metal stamping having a substantially planar socket securing portion, a pair of integral resilient ears initially bent out of the plane of the portions, integral extensions on said ears normally of the ears and arranged to enter apertures in a mounting panel when the ears are bent to alignment with the securing portions and to bear frictionally in such apertures under spring pressure when the ears are released.

2. A radio tube socket supporting element comprising an integral metal stamping having a substantially planar socket securing portion, a pair of integral resilient ears initially bent out of the plane of the portions, integral open ended cylindrical extensions on said ears normally of the ears and arranged to enter apertures in a mounting panel when the ears are bent to alignment with the securing portions and to bear frictionally in such apertures under spring pressure when the ears are released.

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