July 2, 1929. E. G. DANIELSON 1,719,288

RADIO TUBE SOCKET

Filed Nov. 23, 1925

FIG. 1.

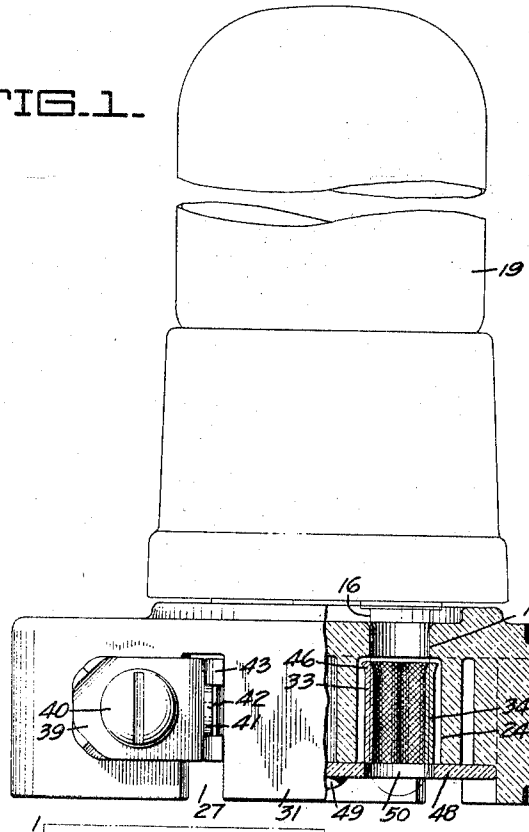


FIG. 3.

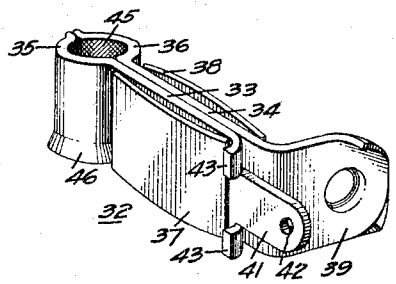
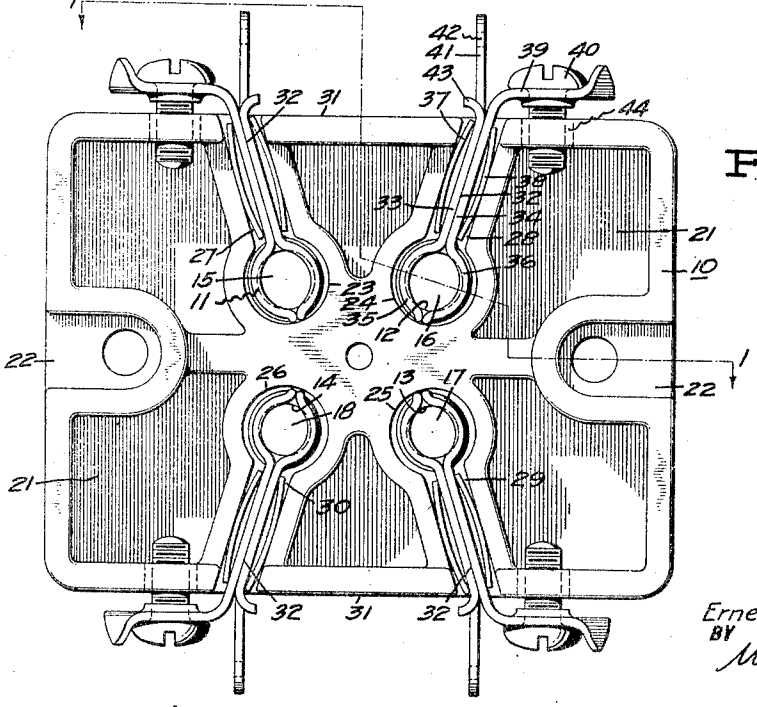


FIG. 2.



INVENTOR
Ernest G. Danielson
BY White & Frost
his ATTORNEYS

Patented July 2, 1929. 1,719,288

UNITED STATES PATENT OFFICE.

ERNEST G. DANIELSON, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO GRAY & DANIELSON MFG. CO., OF SAN FRANCISCO, CALIFORNIA, A COPARTNERSHIP CONSISTING OF THOMAS B. GRAY AND ERNEST G. DANIELSON.

RADIO TUBE SOCKET.

Application filed November 23, 1925. Serial No. 70,741.

The device of this invention is for the purpose of providing a convenient mounting or socket for electron emission tubes which are commonly known as radio tubes. It is especially adapted for radio tubes which are provided with projecting contact prongs which constitute the sole means for securing the tube to a socket.

It is an object of this invention to devise a radio tube socket which is provided with full floating electrical contact elements for receiving the tube prongs so that the contact members are free to align themselves to compensate for irregularities in the spacing of the prongs in order to insure making a perfect and uniform electrical contact.

It is a further object of this invention to construct a radio tube socket by adapting a base member to receive the prongs of a radio tube and to provide a plurality of slots in the base member for receiving the contact elements which contact with the prongs. It is proposed to mount the contact elements within these slots so as to allow limited movement of the inner ends of the elements in any direction lateral to the tube prongs.

It is a further object of this invention to construct the individual contact means in the form of a plurality of strips adapted to be mounted within a slot in the base member and to engage opposed sides of tube prongs at their inner ends. It is proposed to curve the inner ends of the strips so as to contact with substantially the entire surface of the prongs, and to extend at least one of these strips through the side of the base member to provide a terminal connector.

Other objects of the invention will be apparent from the following description in which I have set forth the preferred embodiment of my invention.

Referring to the drawings:

Figure 1 is a sectional elevational view of the socket of this invention taken along the line 1—1 of Fig. 2.

Fig. 2 is a bottom view of the socket as shown in Fig. 1, certain parts being removed.

Fig. 3 is a detail view showing one of the electrical contact elements.

The device comprises generally a base or body member which is adapted to receive the prongs of a radio tube. Thus, referring to the drawings, the base member 10 is provided with a plurality of apertures 11, 12, 13 and 14 which are adapted to receive the prongs 15, 16, 17 and 18 respectively of a radio tube 19. The two prongs 15 and 16 are usually larger in diameter than the prongs 17 and 18 in order to insure bringing the correct prongs into contact with the several electrical contact elements to be later described. The base member 10 is preferably constructed of some suitable molded insulating compound, such as a phenolic condensate product and is hollowed out on its under side as at 21 to lighten and cheapen its construction. Spaced apertures 22 are provided to receive screws or bolts to clamp the base member to a support or panel of a radio receiving set.

Below the apertures 11—14 the base member is provided with enlarged lower openings 23 to 26 inclusive for the reception of the inner ends of electrical contact elements. The base member is also provided with a plurality of vertical slots 27 to 30 inclusive which communicate between these lower openings and the outer periphery 31 of the base. Positioned within each of the vertical slots 27 to 30 inclusive there is an electrical contact element designated generally as 32. These electrical contact elements are all identical with the exception that the two contact elements for the enlarged prongs 15 and 16 are made correspondingly larger at their inner ends to receive these enlarged prongs.

Means have been provided for mounting the electrical contact elements within the base member in such a manner that they are free to align themselves to compensate for irregularities in the tube prongs. That is, they are floating contacts which have limited movement in any direction lateral to the tube prongs so as to automatically adjust themselves so as to always make perfect contact with the tube prongs. The specific construction of these contacts preferably comprises a plurality or pair of metallic strips 33 and 34 having their inner ends 35 and 36 curved to form substantially semi-cylindrical surfaces which are adapted to substantially surround

the tube prongs. These strips are adapted to be positioned in one of the vertical slots, for example the slot 28 and lower opening 24. In order to resiliently urge these strips together to effectively grip the sides of the tube prongs and still to allow both lateral and longitudinal sliding movement of the strips there are provided a pair of bowed leaf springs 37 and 38 which are positioned between the side walls of the slot 28 and the outer surfaces of the two strips 33 and 34. Thus the end portions 35 and 36 are resiliently urged together to grip opposed sides of one of the tube prongs while at the same time these end portions are free to move a certain limited amount in a lateral direction and also in a longitudinal direction. Thus, the electrical contact means are floating devices which can readily adapt themselves to irregularities in the positioning of the tube prongs.

For making electrical connections with the socket at least one of the strips 34 or 35 is extended out beyond the outer periphery 31 of the base member to provide a terminal connector. In the particular construction illustrated, both of the strips have been extended, one forming a terminal connector to which wires may be soldered, while the other forms a detachable terminal connector. Thus, the strip 34 has a laterally bent portion 39 which is threaded to receive a screw 40 while the strip 33 is extended to form the terminal tab 41 which is apertured as at 42 to receive a wire connection which is to be soldered to the tab 41. The strip 33 is also provided with outturned lugs 43 which serve to limit the inward movement of the strip 33. The base member is preferably apertured as at 44 to allow the screws 40 to extend therethrough. Thus, the conductor wires may be connected directly to the contact strip which makes electrical contact with the tube prongs.

In order to more securely grip the tube prongs to the electrical contact elements the curved portions 35 and 36 are also preferably knurled along their inner surfaces as at 45 to increase the friction between the contacts and the two prongs and to exert a wiping action upon the prongs. This wiping action tends to remove any drops of solder that may be present upon the tube prongs. The upper edges 46 of the curved portions 35 and 36 are also flared outwardly so as to more effectively guide the electrical contact means into engagement with the tube prongs. To retain the electrical contact means 32 within the slots 27 to 30 inclusive, a retaining member or plate 48 is provided which is secured to the under side of the base member 10 by suitable means, such as a pin 49. This retaining plate is preferably perforated as at 50 to allow the tube prongs to extend therethrough.

A socket such as described will always exert a uniform gripping action on the tube prongs as the self aligning feature permits the contact surface to bear evenly upon substantially the entire surface of the tube prongs. There can be no possibility of loose contacts because the connector terminals are an integral part of the contact elements.

I claim:

1. In a tube socket, a base member adapted at its upper face to receive the downwardly projecting prongs of a radio tube and having a plurality of slots extending laterally to the sides thereof, electrical contact elements positioned in each of said slots, said positioning of said elements permitting sliding movement thereof in the direction of the extension of said slots, and means for retaining the contact elements within their respective slots.

2. In a tube socket, a base member adapted at its upper face to receive the downwardly projecting prongs of a radio tube and having a plurality of slots extending from the base to the sides thereof, and electrical contact means disposed in each of said slots, each of said contact means being slidable relative to the base in the direction of the extension of its associated slot, each of said contact means comprising a plurality of metallic strips formed at their inner ends to receive a tube prong, and resilient means for urging said strips to grip opposite sides of a tube prong.

3. In a tube socket, a base member adapted at its upper face to receive the downwardly projecting prongs of a radio tube, electrical contact elements formed to grip the sides of each of said prongs, said base member having a plurality of slots extending from within the base laterally to its outer periphery, and means for mounting each of said contact means in one of said slots, said means permitting sliding movement with respect to the base member in the direction of extension of its associated slot.

4. In a tube socket, a base member adapted at its upper face to receive the prongs of a radio tube, electrical contact elements each comprising a pair of juxtaposed metallic strips formed to grip a tube prong at their inner ends, said base member having a plurality of slots extending laterally to the periphery of the same, and means for mounting each of said contact elements in one of said slots for limited sliding movement in the direction of extension of its associated slot.

5. In a tube socket, a base member adapted at its upper face to receive the prongs of a radio tube, electrical contact elements each comprising a pair of juxtaposed metallic strips adapted to grip a tube prong at their inner ends, said base member having a plurality of slots extending laterally to the periphery of the same, and means for mounting each of said contact elements in one of said slots, said means permitting limited

sliding movement laterally with respect to said prongs and in the direction of the length of said strips.

6. In a tube socket, a base member adapted at its upper face to receive the prongs of a radio tube, electrical contact elements each comprising a pair of juxtaposed metallic strips shaped at their inner ends to receive a vertical prong, said base member having a plurality of slots extending outwardly to the sides of the same, the contact elements extending inwardly from the sides of the base, and means including leaf springs for mounting each of said contact elements in one of said slots for limited lateral and longitudinal movement.

7. In a socket adapted to support and make connection with a radio tube having terminal prongs, a base member having a plurality of slots, and an electrical contact element disposed in each slot and formed at its inner end to engage a tube prong, each of said elements comprising a pair of metallic strips, said strips being slidable relative to the base in the direction of their length, the combined thickness of said strips being substantially less than the width of a slot, and resilient means for normally retaining said strips substantially centrally of said slots.

8. In a socket adapted to support and make electrical connection with a radio tube having terminal prongs, a base member having at least three slots extending laterally to the outer periphery of the same, and an electrical contact element disposed in each slot, each element comprising a pair of flat metallic strips in juxtaposition, such strips having their inner ends curved transversely to engage opposite sides of a tube prong and having a combined thickness substantially less than the width of said slot, resilient means for centering the element with respect to the slot, said strips being slidable in the direction of their length relative to said base.

In testimony whereof, I have hereunto set my hand.

ERNEST G. DANIELSON.