June 24, 1930. J. B. KIRBY 1,767,139

RADIO SOCKET

Filed Sept. 15, 1925

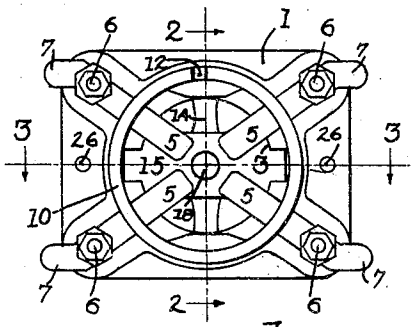


Fig. 1

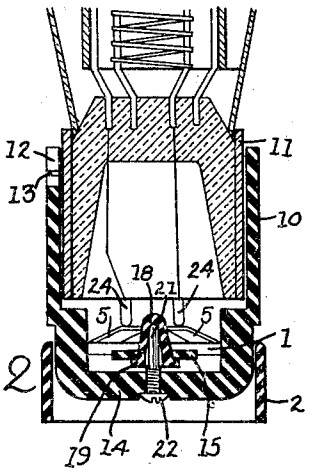


Fig. 2

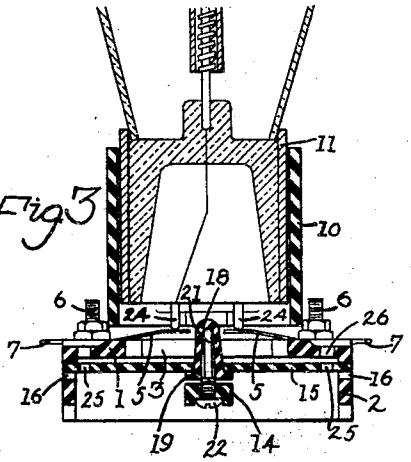


Fig. 3

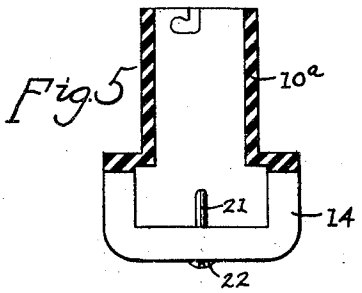


Fig. 5

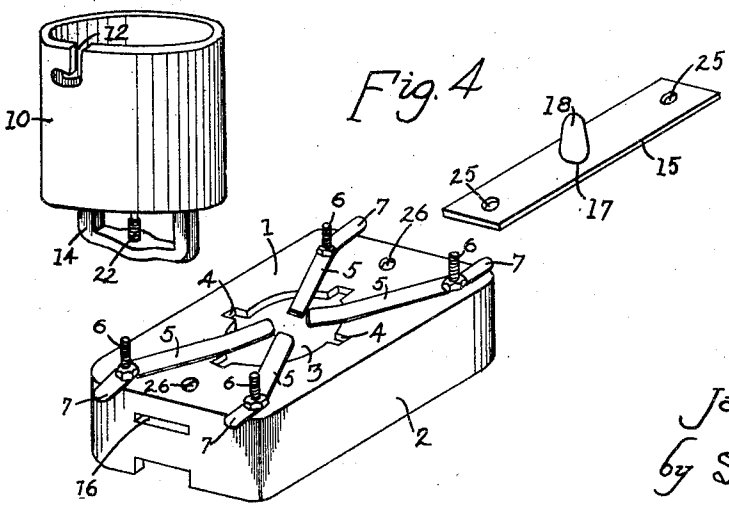


Fig. 4

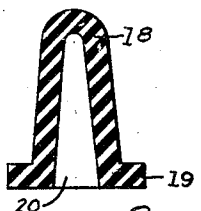


Fig. 6

James B. Kirby
Inventor
by Smith & Freeman
Attorneys

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UNITED STATES PATENT OFFICE

JAMES B. KIRBY, OF WEST RICHFIELD, OHIO

RADIOSOCKET

Application filed September 15, 1925. Serial No. 56,456.

This invention relates to what is known as radio sockets, by which is meant the devices by which radio tubes are secured in operative position and their elements connected in the desired electrical circuits. The objects of the invention are the provision of flexibly or elastically mounted sockets so cushioned as to shield the tubes from mechanical shocks and vibrations which are known to impair the operation of the tubes and import objectionable qualities into the waves or signals generated thereby. Other objects of the invention are to provide a flexibly mounted socket in which the cushioning effect shall be produced by the same contact members which complete the circuits; the provision of means whereby good contact is insured without impairing the cushioning effect; the provision of sockets which shall produce a minimum of current loss by eddy-currents, inductance, capacity, or leakage; the provision of a socket readily adaptable to different sizes of tubes; while further objects and advantages of the invention will become apparent as the description proceeds.

In the drawings accompanying and forming a part of this application I have illustrated certain physical forms in which my inventive idea is embodied although it will be understood that these drawings are merely illustrative of the principles of my invention and are not intended to be exhaustive of all the mechanical adaptations of the same. Fig. 1 is a top plan view of my improved socket; Figs. 2 and 3 are vertical sectional views corresponding to the lines 2–2 and 3–3 thereof respectively; Fig. 4 is a separated perspective view of the different parts of my improved socket; Fig. 5 is a sectional view partly in elevation of a substitute socket member adapted to receive a smaller based tube, and Fig. 6 is a sectional view of the center body.

My improved socket comprises essentially a rigid base part adapted to be secured to a suitable foundation, and a receptacle portion flexibly coupled thereto. This base portion comprises, a hollow block of insulating material such as Bakelite, hard rubber, porcelain or the like, having a flat top 1 and a depending side wall 2, said top being formed with a central opening 3 formed at opposite points with notches 4–4. Carried by this top are four contact springs 5 of thin flexible metal which overlap the aperture 3 and are rigidly secured to the base at a sufficient distance from their inner ends to render the latter freely flexible. These fastenings preferably include suitable binding posts 6 by means of which wires may be connected, although the ends of the springs are also preferably extended as at 7 to form solder ears. I have shown these springs as located above the top 1, although I do not limit myself thereto.

The receptacle comprises a cylindrical part 10 also made of insulating material such as Bakelite, hard rubber, or any one of numerous synthetic waxes, its cavity being the size and shape to receive snugly the base 11 of an electronic tube such as is illustrated in Figs. 2 and 3. This receptacle is formed at a suitable point with a bayonet slot 12 for the reception of the bayonet pin 13 with which such tube base is provided. The opposite end of this receptacle is bridged by a narrow member 14, preferably integral therewith, and depending sufficiently below the receptacle so as to extend into the aperture 3 to a point below the top surface 1. The two sides of the member 14 are formed to fit loosely in the notches 4–4. Carried by the base member and extending from end to end thereof is a securing member 15, preferably made of insulating material, but also preferably elastic to a substantial degree. This is shown as a thin rectangular strip having its two ends received in slots 16 formed in the flange 2. This strip projects across the member 14 in such wise as to lock the two parts loosely together.

The strip 15 is formed at its center with an aperture 17 in which is mounted a hollow thimble shown enlarged in Fig. 6 and comprising an elongated body 18 and having at its lower end the circular flange 19. This thimble is provided with a downwardly opening cavity 20 of a size and shape to receive loosely the upstanding point 21 of a screw 22 carried by the member 14. When

assembled the flange 19 engages the bottom face of the strip 15 while the body of the thimble rises into the space between the ends of the four springs 5—5.

When the tube base is secured in this receptacle, the contact points 24 with which said tube is provided press downwardly on the springs 5—5, respectively, whose upward force elevates the tube and receptacle so as to bring the point 21 of the screw 22 into engagement with the bottom of the recess of the thimble and also to bend the strip 15 a small amount. It is an important feature of my invention that when thus assembled the end of the screw 21 lies substantially on the same plane with the ends of the contacts 24. Owing to the fact that the strip 15 is generally considerably stiffer than the springs the amount of its deflection is smaller than that exhibited by the springs yet it is preferable that the same be sufficiently limber to exhibit at least a slight deflection. With this arrangement the tube together with its receptacle can gyrate or wabble freely about the point of the screw 21 as a center, and inasmuch as this lies in the same plane with the ends of the contact members this gyration is not resisted by any frictional rubbing between the contacts and springs but is merely cushioned by their pressure. Accordingly cushioning is effected by the same springs which produce the contact and is not impeded in any manner so that the tube is effectively insulated from mechanical shocks or vibrations.

In case the socket is to be employed for tubes of a different sized base it is sufficient merely to substitute a receptacle of different size as shown at 10^a in Fig. 5, the same comprising a member 14 of the size previously described. When the device is made of such material as Bakelite it is generally best to form this member 14 integral with the receptacle although I do not limit myself to this construction. In order to hold the strip 15 in place the simplest mode is to form the same with apertures 25 in line with the holes 26 in the base by means of which the same is fastened to the foundation with which it is used. It will be understood, however, that a great many changes in form, shape, size, arrangement, appearance and design of all the different parts can be made without departing from the scope of my invention and that I do not limit myself in any wise except as recited in my several claims which I desire may be construed each independently of limitations contained in other claims.

Having thus described my invention what I claim is:

1. A cushioned socket for radio tubes comprising a plurality of springs which press against the contact points of the tube, and a receptacle member adapted to withstand the pressure of said springs, said receptacle member being mounted for universal movement about a center located between and in substantially the same plane with said contact points.

2. A radio socket comprising a base, a receptacle pivoted to said base, and a plurality of contact springs carried by said base and adapted to engage the contact points of a tube secured in said receptacle, said springs serving the double function of electrical connections to said points and cushioning supports for said tube, the pivot center being located between said contact points and in substantially the same plane therewith.

3. A radio socket comprising a base, a non-metallic receptacle flexibly coupled thereto, a plurality of springs carried by said base adapted to engage the contact points of a tube which is secured in said socket, said springs being wholly separate from and independent of said receptacle and the coupling between said base and receptacle including a flexible joint between said springs and substantially in the same plane with the ends of said contact points.

4. In a radio socket, in combination a base having a hole in its top, a receptacle having a bridging member projecting through said hole, a coupling member carried by said base and intersecting said bridging member to hold the parts loosely together, said receptacle adapted to receive a radio tube, and springs carried by said base adapted to engage the contact points of such tube and convey current thereto and also to hold said receptacle away from said base.

5. In a radio socket, in combination, a base, a receptacle adapted to receive a radio tube and having open top and bottom, said base being flexibly coupled to said receptacle, such coupling including a pivot point located between said contact points and substantially in the same plane therewith, and a plurality of contact springs carried by said base adapted to be engaged by said points and also to support the weight of said receptacle and tube.

6. In a radio socket, a receptacle having an open top and bottom adapted to receive a tube, and a bridging member carried by one end of said receptacle, in combination with a base member having springs adapted to engage the tube contacts and press the same in one direction and also having a securing member engaging said bridging member to withstand the thrust of said springs.

7. In a radio socket, in combination, a base having an apertured top and a surrounding depending side wall, a receptacle open at both ends and adapted to receive a tube, said receptacle having a bridging member projecting beyond one end and depending into the aperture in said top, a removable member carried by said base and pro-

jecting through said bridging member, and springs carried by said base and projecting into the space between said base and receptacle so as to be engaged by the contact points of any tube secured in said receptacle.

8. A receiver for radio tubes comprising a base, a plurality of elastic sheet metal springs carried by said base, a non-metallic tube receiving member movable relatively to said base, said base and member having interfitting, substantially rigid portions and said springs being of a strength to support said receiver and the attached tube in such yielding manner relatively to said base as to cushion said tube against external shocks, the degree of relative movement between said base and receiver permitted by the amount of play between said interfitting portions being less than the limit of elasticity of said springs whereby injury to the latter is prevented.

In testimony whereof I hereunto affix my signature.

JAMES B. KIRBY.