

Aug. 27, 1929.

M. B. GROUT

1,726,179

SOCKET

Filed Feb. 8, 1926

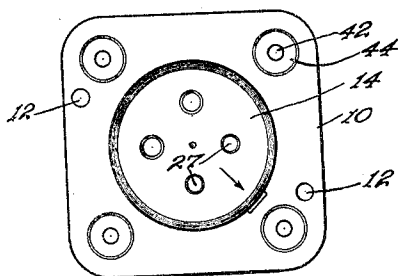


Fig. 1.

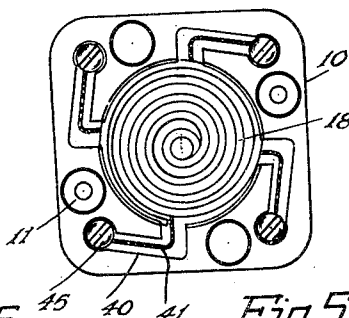


Fig. 5.

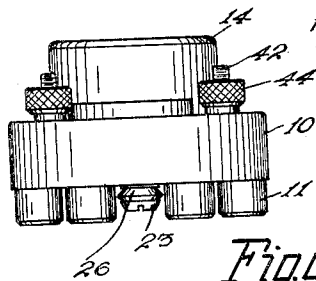


Fig. 2.

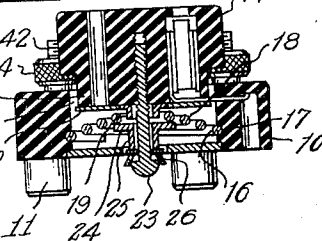


Fig. 6.

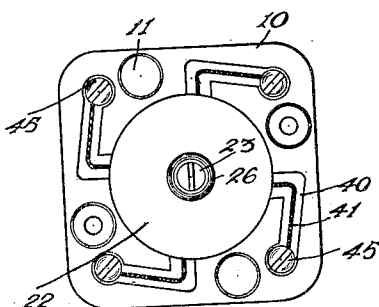


Fig. 3.

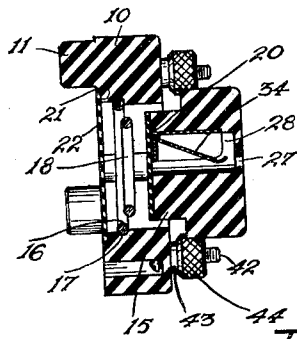


Fig. 7.

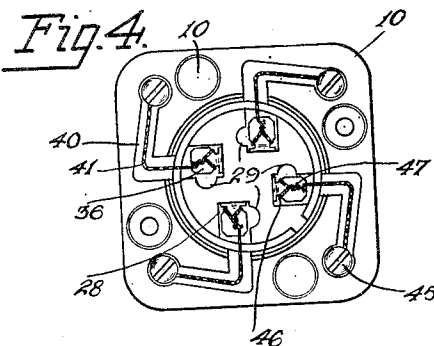


Fig. 4.

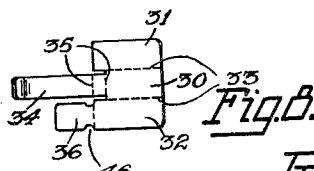


Fig. 8.

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UNITED STATES PATENT OFFICE.

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SOCKET.

Application filed February 8, 1926. Serial No. 86,715.

This invention relates to sockets and more particularly to sockets adapted to receive and support audion tubes or the like and which are resiliently supported so as to cushion and absorb the jars and vibrations to which tubes are commonly subjected.

It has been found very desirable to provide a spring or cushioning means between a radio tube socket and its supporting base in order that the vibrations and sharp shocks or jars will be cushioned.

One of the objects of the present invention is the provision of an improved resiliently supported socket which will be durable and simple in construction, cheap to manufacture, and which will provide a maximum amount of cushioning for the tube socket.

Another object of the invention is the provision in a socket, of the above described character, of an improved device for completing electrical connection to the terminal pin contacts of tubes associated with the socket.

One of the features of the invention is the provision of a cone-shaped spiral spring by means of which the tube socket is resiliently supported from the base to permit yielding movement in all directions.

Another feature of the invention resides in the spring contact constructed of a punched piece of sheet metal so folded as to provide a spring contact finger for engagement with the terminal pin of the tube and a terminal tab to which a flexible conductor may be connected without the use of a soldered connection.

Other features and advantages will appear from time to time as the description of the invention progresses.

It is believed a further disclosure of the invention will be understood more readily from a detailed description thereof taken in connection with the accompanying drawings, in which:

Fig. 1 is a plan view of the socket and base of the present invention;

Fig. 2 is a side view thereof;

Fig. 3 is a view of the underside of the base of the socket;

Fig. 4 is a view similar to Fig. 3, but showing the cover plate at the center of the base removed;

Fig. 5 is another view similar to Fig. 4, but showing the spiral cone-shaped or helical spring in position;

Fig. 6 is a transverse substantially diametric section through the socket and base;

Fig. 7 is a section through the socket and base in the region of one of the contact elements adapted to receive and make engagement with the contact terminal pin of the tube, and

Fig. 8 shows the punched blank from which the contact element of the tube socket is formed.

Referring now to the drawing, in which like reference characters in the several views indicate the same parts, 10 indicates the base for the socket having the supporting lugs or legs 11 on the lower side thereof. The base will preferably be provided on the opposite sides thereof with the openings 12 for the reception of screws by means of which the socket base may be secured to the mounting board. The base 10 is provided centrally thereof with a circular opening 13.

The tube socket member 14 is substantially cylindrical, as shown in Fig. 1, and of a size slightly greater than the opening 13 within base 10, and is provided with a portion 15 of reduced diameter adapted to be loosely received by the opening 13.

Positioned within the opening 13 in base 10, with the outer turn or loop 16 thereof received within a circumferential groove 17 in the base, is a spring 18. This spring 18 is a combination of a spiral and helical spring, in that, the several turns are of decreasing diameter, as a helical spring, but each turn is displaced axially of the spring, as in a spiral spring. In other words, it is a sort of cone-shaped spiral spring. The spring construction is clearly disclosed in Figs. 5 and 6 of the drawing. The last coil or innermost turn of the spring 18, at the apex thereof, is formed into a projecting lug 19 which is snugly received by the opening at the center of the washer 20 of fiber or other suitable material.

The opening 13 in the base 10 is provided, at the lower edge thereof, with a shoulder 21 adapted to receive the periphery of the disc 22 of insulating material. The disc 22 is provided centrally thereof with an opening through which passes the screw

or bolt 23, the inner end of which is screw threaded into the socket member 14. Positioned about the screw 23 is the disc 24, integral with which is the collar 25. Positioned about the screw 23, and under the head thereof, is the flanged washer 26 which is of such a size as to prevent the head of the screw passing through the opening at the center of the disc 22.

From the structure thus far described it will readily be seen that when screw 23 is turned into the socket member 14, the socket member is brought into firm engagement with the disc 20 and the spring 18 will be placed under a slight stress. In view, however, of the fact that the screw 23 passes loosely through the disc 22 and also through the center of lug 24, the washer 20, and consequently the socket member 14, are carried freely by the final turn at the apex of the spring 18, consequently permitting a universal yielding movement of the socket and acting to substantially cushion the shocks and jars to which the tube may be subjected.

The socket member 14 is provided with a plurality of openings 27 adapted to receive the contact terminal pins projecting from the bases of audion tubes associated therewith. The member 14 is also provided under each of the openings 27 with a substantially square recess 28. From an inspection of Fig. 7, it will be noted that the opening 27 is at one side of the recess 28 and if desired the recess 28 will be provided on one side thereof with a substantially semi-cylindrical groove 29 in which the contact terminal pin will slide. Within each of the square recesses 28 is a contact device adapted to make engagement with the terminal of a tube associated with the socket.

The contact device of the present embodiment of the invention is formed from a blank of sheet metal, such as shown in Fig. 8. This blank and contact element will preferably be made as a punching. Referring to Fig. 8, 30 indicates what we may call the base of the contact element, having on the opposite sides thereof the wings 31 and 32. The wings 31 and 32 will preferably be folded at right angles to part 30 on the dotted lines 33 to form a trough like structure substantially square in cross section. The contact spring 34 will then be folded along the dotted lines 35 to extend diagonally of the trough like structure, as clearly indicated in Fig. 7. Finally the terminal tab 36 will be folded at right angles to the wing 32 so as to occupy a position at the end of the trough, as clearly disclosed in Fig. 4. A contact device, such as just described, will be inserted in each of the recesses 28 in the socket member so that a contact spring 34 will substantially underlie each of the openings 27 in the socket. Thus when a tube is

associated with the socket 14 and the terminal pins of the tube inserted in the openings 27, the said terminal pins will slide along the grooves 29 at the sides of the recesses 28, slightly displacing the springs 27. Thus the springs 27 will make wiping engagement with the terminal pins and act, not only to complete the electrical circuit to the tube, but also to snugly hold the tube in position.

The base 10 is provided on the underside thereof with four substantially L-shaped grooves or channels 40, within which lie the flexible conductors 41 which join each of the contact tabs 36 to the binding posts 42. The binding posts 42 pass upwardly through the base and are secured in position by threaded or nut members 43, a knurled clamping nut 44 being provided on each binding post 42 above nut 43. One end of the flexible conductor 41 will preferably be passed about the screw or binding post 42 and clamped between the head 45 of the screw and the base. The opposite end of the flexible conductor will be passed about the reduced portion 46 of the terminal tab 36 and twisted upon itself, as clearly shown in Fig. 4. It will be noted from this figure that the twisted portion 47 of the flexible conductor overlies the flat surface of the tab 36. Referring now to Figs. 6 and 7, it will be noted that the disc or washer 20 overlies the twisted portions 47 of the flexible conductors 41 and, due to the pressure exerted by the screw 23, the portion 47 is held in firm electrical contact with the tabs 36; thus avoiding the necessity of a soldered connection between the flexible conductor and the contact element carried by the tube and greatly facilitating the assembling of the device.

By the present invention, the socket is yieldingly supported for movement in all directions by a single resilient supporting member. Also cheap and satisfactory means are provided, independent of the supporting means, for extending the electrical circuits to the contact pins of the tubes.

While in the drawing, but a single form of the invention is disclosed, it is to be understood that many modifications are contemplated, both in the means for supporting the socket and in the manner of extending the circuits to the tube elements. The invention should, therefore, be limited only by the scope of the appended claims.

Having thus described my invention what I claim is new and desire to secure my Letters Patent of the United States is:

1. In combination, a tube socket, a base for said socket, an insulating member, a spring having a projecting lug secured to said insulating member, said spring resiliently supporting said socket from said base, said insulating member adapted to engage

a flexible conductor and by means of its resiliency maintain the same in electrical connection with a contact device.

2. In combination, a tube socket, a base for said socket, an insulating member secured to said socket, a spring disposed substantially centrally of said socket and said base and having one end secured to said insulating member, said spring resiliently supporting said socket from said base, and said insulating member adapted to engage a flexible conductor and by means of its resiliency maintain the same in electrical connection with a contact device.

3. In combination, a tube socket, a base for said socket, an insulating member secured to said socket, a single spring having a projecting lug secured to said insulating member for resiliently supporting said socket from said base, said insulating member adapted to engage a flexible conductor and by means of its resiliency maintain the same in electrical connection with a contact device.

4. In combination, a tube socket, a base for said socket, an insulating member secured to said socket, a single spring disposed substantially centrally of said socket and base and secured to the center of said insulating member for resiliently supporting said socket from said base, said insulating member adapted to engage a flexible conductor and by means of its resiliency maintain the same in electrical connection with a contact device.

5. In combination, a tube socket, a base for said socket, a spiral spring disposed substantially centrally of said socket and base resiliently supporting said socket from said base, a contact device having a terminal tab, a flexible conductor joined to said tab, and an insulating member adapted to cooperate with said spiral spring to maintain said conductor in electrical connection with said terminal tab.

6. In combination, a tube socket, a base for said socket, a single spiral spring disposed substantially centrally of said socket and base resiliently supporting said socket from said base, a contact device having a terminal tab, a flexible conductor joined to said tab, and an insulating member adapted to cooperate with said spiral spring to maintain said conductor in electrical connection with said terminal tab.

7. In combination, a tube socket, a base for said socket, a conical spiral spring disposed substantially centrally of said socket and base, the base of said spring being secured to said base, the said socket being mounted upon an insulating member secured to the apex of said spring whereby said

socket is resiliently supported from said base, a contact device having a terminal tab, a flexible conductor joined to said tab, said insulating member and said spiral spring adapted to maintain said conductor in electrical connection with said terminal tab.

8. In combination, a tube socket, a base for said socket, a helical spring disposed within said base, the outer turn of said spring being secured to said base, the said socket being supported upon the inner-turn of said spring, a contact device having a terminal tab, a flexible conductor joined to said tab, and an insulating member adapted to cooperate with said helical spring to maintain said conductor in electrical connection with said terminal tab.

9. In combination, a tube socket, a base for said socket, resilient means supporting said socket from said base, a contact device within said socket for engaging a terminal contact pin of a tube associated therewith, a terminal tab joined to said contact device, a flexible conductor joined to said tab and overlying a face thereof, said supporting means being arranged to maintain said conductor in electrical engagement with said tab.

10. In combination, a tube socket, a base for said socket, resilient supporting means for said socket carried by said base, means limiting the movement of said socket from said base and maintaining said resilient supporting means under compression, contact devices within said socket arranged to engage the terminal contact pins of tubes associated therewith, a terminal tab connected to each of said contact devices, flexible conductors, one joined to each of said tabs and overlying a face thereof, said supporting means being arranged to resiliently maintain said conductors in electrical contact with said tabs respectively.

11. In combination, a tube socket, a base for said socket, resilient supporting means for said socket carried by said base, an insulating plate between said supporting means and said socket, means for limiting the movement of said socket from said base and maintaining said supporting means under compression, contact devices within said socket arranged to engage the terminal contact pins of tubes associated with said socket, a terminal tab connected to each contact device, flexible conductors, one joined to each of said tabs, said conductors being resiliently clamped between said insulating plate and said tabs respectively.

In testimony whereof I have signed this specification.

MARTIN B. GROUT.