

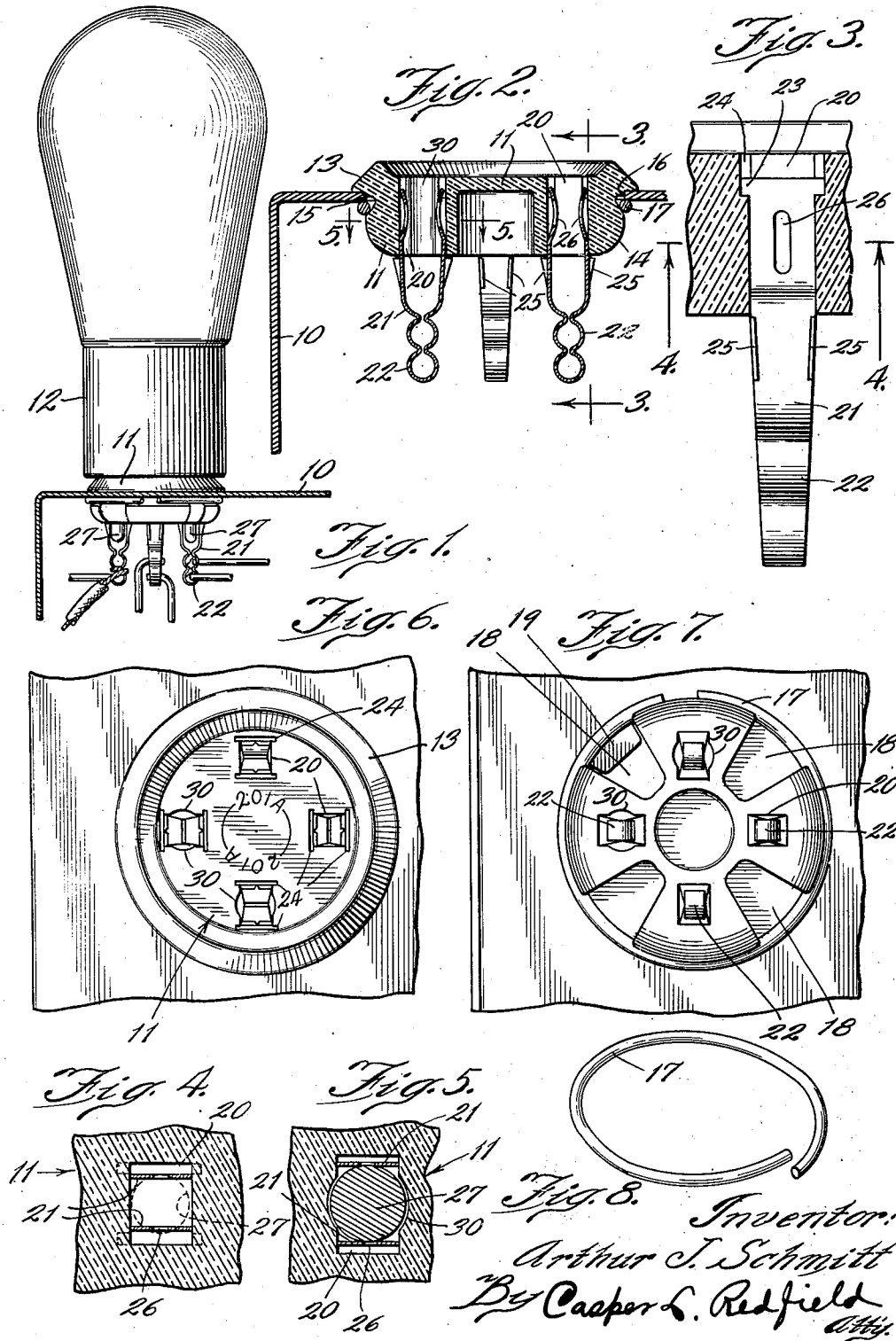
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SOCKET

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SOCKET

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My invention relates to radio sockets, and has for its object improvements in devices of that character.

One of the objects is to place each contact spring inside of a cavity formed in an insulating body so as to prevent an angular insertion of the tube prongs which would give a "set" to the spring to be engaged.

Another object is simplicity and ease in assembly of parts. A third object is compactness by which space is saved. A fourth object is to make all sockets interchangeable with each other in any position of wiring. A fifth object is to so locate the contact springs within an insulating holder that a person handling the radio receiver with a tube removed cannot receive an electric shock. Other objects will appear from the description.

In the accompanying drawing

Fig. 1 is an elevation of the present device secured to the chassis of a radio set and supporting a tube;

Fig. 2 is an enlarged sectional elevation of the socket secured to the chassis;

Fig. 3 is a still more enlarged section on line 3-3 of Fig. 2;

Fig. 4 is a section on line 4-4 of Fig. 3;

Fig. 5 is a section on line 5-5 of Fig. 2 showing one of the longer rectangular openings at the scale of Fig. 4, rotated 90 degrees, and showing a large tube terminal engaging a spring of the socket;

Fig. 6 is a plan of Fig. 2;

Fig. 7 is a bottom view of Fig. 2; and

Fig. 8 is a perspective view of the locking ring used to hold the device to the chassis.

The socket 11 is a single piece of insulating material preferably consisting of phenolic resin molded into the form desired. It is in the general form of a thick disk having an extreme outside diameter about equal to that of the tube base 12. The lower part of this disk is of slightly less diameter than the upper part and is arranged to pass thru a circular opening in the chassis 10. This leaves a lip 13 to rest on the upper face of the chassis as shown in Fig. 2. The lower part of the disk is rounded as shown at 14 and terminates in a recess 15 under the lip 13 and of less diameter than the opening in the chassis.

Just under the lip 13 and over the recess 15, the disk has a slight shoulder 16 fitting into the hole of the chassis. Located in the recess 15, and bearing partly on the upper part of the round 14 and partly against the inner face of the chassis, is a spring ring 17. This ring is initially in the

form of one turn of a helix, and when in place acts to press upward on the chassis and downward on the socket. It thus forms a spring locking means to hold the socket firmly to the chassis with the lower face of the lip 13 in contact with the upper face of the chassis.

The socket has as many pin receiving openings as there are pins or prongs on the radio tube to be held. The present drawing represents a socket for a tube having four pins, and the openings for these pin terminals pass entirely thru the disk 11. In the under face of the disk is an equal number of recesses 18, and these recesses extend upward to a level with the under face of the lip 13.

It was stated that the lower part of the disk was arranged to pass thru a circular opening in the chassis. However, that opening is not a complete circle as at one place there is an inwardly projecting lug or key 19 which will fit easily into any one of the recesses or keyways 18 and prevent the socket from being turned in its seat. If it is desired to shift the position of the socket with respect to the chassis, the recesses 18 furnish convenient means for inserting a tool to release spring 17.

As shown in Figs. 2 to 7, there are four rectangular openings 20 to receive tube pins and contact springs 21. These springs are bent from long strips to form loops 22 near the centers of the bends, and have T-headed ends 23 as shown in Fig. 3. The upper ends of the openings 20 have lateral recesses 24 to receive the T-heads, and deep enough to ultimately locate those heads a considerable distance below the upper face of the socket. As so made, a person cannot get an electric shock by placing his finger on the socket and over an opening.

Each spring 21 has integral wings 25 which are bent outward so that they project in a direction perpendicular to the outer faces of the spring. The distance between the upper edges of wings 25 and the lower faces of the T-heads 23 is equal to the distance between the bottoms of the recesses 24 and the bottom face of the disk. The result is that when a spring is pushed downward in any opening 20 until the T-head comes to the bottoms of the recesses 24, the resiliency of the spring will force the wings 25 under the lower face of the disk and thus lock the spring against displacement. A spring may, however, be removed by pressing its two legs toward each other until the wings 25 are inside of its opening 20, after which the spring may be pushed upward. The recesses 24, which are advantageous-

ly in the form of relatively narrow slots, serve also by receiving the T-heads to desirably fix the relative rotative relations of the body and contact members.

5 Those parts of a spring 21 which are between the wings and its T-heads are curved inward as shown in Fig. 2 and are slotted as shown at 26. When a tube pin 27 (Figs. 1 and 5) is inserted in an opening 20 it engages the edges of the slots 26 and pushes the legs of the spring from each other as may be seen by comparing 10 Figs. 4 and 5. The curves on the legs of the spring at these places are rather short, the ends of the curves are backed by the walls of the opening, and the slots 26 are given a width which will reduce the stiffness to a desired degree. 15

Most radio tubes have one or more of its contact pins or prongs of larger diameter than the others, the purpose being to ensure that it be inserted in its socket only in a position which will correspond to the wiring to which connections are to be made. To provide for this, some of the openings 20 are large enough to receive the larger pins and some are large enough to receive only 20 the smaller pins. At the same time it is desired that the same contact springs will fit equally well in the openings of different sizes. 25

As stated before, the openings are rectangular in shape. The width of the openings where they are engaged by the springs is the same in all cases, and is great enough to receive the smaller pins but not the larger ones. One or more of the openings, two in the present case, is slightly longer than the others, and has recesses 30 in the walls not engaged by the legs of the spring. These recesses permit the passage of the larger pins, and the longer rectangular opening permits the spring 21 to accommodate itself to such pins. 35

Wires are connected to the springs 21 by inserting them in loops 22, or by wrapping them around the springs between loops and then soldering them. The way of making these connections is shown in Fig. 1 and needs no description. 40

It is to be observed that the entire socket is compact and requires less space than the tube it is to support. As a consequence, the size of the chassis is determined by other considerations than the space occupied by this device. 45

The device consists of a small block of molded insulation which requires no machine work or riveting, and is held in place by a single spring ring which is no more than one coil of a helical spring. No rivets or screws are required, and no mechanical operations other than pressing 55 the spring ring in place. What is more, the contacts for the molded block and its holding ring, consist of a plurality of contact springs stamped from sheet metal, and are all alike. They are simply pushed into openings molded in the block and hold themselves in place by a self locking operation. 60

Heretofore it has been customary in radio socket construction to use short soldering lugs which were connected to the spring contacts, but 65 which did not extend below them. As a consequence, it was necessary for the user to solder each wire in place separately by hand. When the contacts 21—22 extend down below the ends of the tube prongs as shown in Fig. 1, these lower 70 parts of the springs are independent of the spring action inside of the openings or cavities 20.

Under such conditions, the wires may be connected, as shown in Fig. 1, to all of the sockets mounted in a chassis, and the chassis may then 75 be placed over a container of molten solder so

that the springs will be immersed to a depth which will cover the two loops 22. By such proceeding, all of the wire connections may be soldered by one operation. As the average receiver set requires about thirty or more soldered connections for these sockets, it will be evident that making the central parts of the contact springs into loops which extend a considerable distance below the tube prongs makes it possible to save a large amount of labor. 10

What I claim is:

1. In a socket for electronic tubes, a disk of insulating material having an opening therethru, and the upper part of the opening being larger than the lower part, and a contact spring having two legs inserted in said opening, the ends of the legs being larger than the other parts and resting in the larger part of the opening, and intermediate parts of the legs having projections engaging the disk to retain the contact spring in position when expanded by its own resiliency. 15

2. In a socket for electronic tubes, a disk of insulating material having an opening therethru and with a recess at the upper end of the opening, and a U-shaped contact spring passing thru said opening and having its upper end resting in said recess, said spring having a projection engaging said body at the lower end of the opening when said spring is in said opening and is expanded by its own resiliency. 20

3. In a socket for electronic tubes, a disk of insulating material having an opening therethru, a spring bent at its central portion to form two legs and having a head at the end of each leg, said spring being adapted to have its central portion pass thru said opening and such passage being limited by said heads engaging the body of the material, and means by which the spring, in conjunction with suitable lugs, retains itself 40 in place by its own resiliency.

4. In a holder for an electronic device, a disk of insulating material having an opening therethru, a U-shaped spring bent at its center to form a wire receiving loop and having a head 45 at the end of a leg, said spring being adapted to have its loop pass thru said opening and said head serving to limit the extent of such passage.

5. The combination with a radio chassis having an opening with a projecting lug or key, a body of insulating material having a portion projecting into said opening and said portion having a plurality of recesses each one of which is adapted to receive said lug or key, said body 55 having a similar plurality of openings therethru, springs located in said openings with contact surfaces for tube prongs above and wire connections below.

6. A tube socket containing a one-piece body of insulating material having an opening therethru, and a contact spring retained in said opening by its own resiliency and consisting of curved parts of the legs of a metal strip bent at its central part so as to make the legs approach each other, said curved parts being slotted at their centers and backed at their ends by the walls of the opening within which they are located and the central part extending a considerable distance below the curved parts and serving as 70 means for making wire connections.

7. A tube socket consisting of a disk of insulating material having an opening therethru, and a curved contact spring having a slot in the curved part and the ends of the curve backed by a wall 75

of the opening, said spring being resiliently self-supporting and having an extension projecting below the socket and serving to make electrical connections.

5 8. The combination with a radio chassis having an opening with an inwardly projecting lug, of a disk having a flange resting on the face of the chassis and with a portion of the disk projecting into said opening, a series of recesses in and arranged around the inwardly projecting portion each one of which is adapted to receive said lug, and a corresponding series of contact springs located in openings arranged around the axis of the disk and intermediate said recesses.

15 9. In a socket of the class described, a molded one-piece body of insulating material having an opening passing axially therethrough, said opening at its upper end being adapted to receive therein a cylindrical prong of a radio tube or
20 the like, said opening having an upwardly facing shoulder therein, a lateral extension of said opening in the form of a relatively narrow slot transversely intersecting and communicating with said opening at the upper end thereof, a one-
25 piece spring metal contact member received in said opening spaced substantially downwardly from the upper end of the opening and having an upper shoulder in abutment with said shoulder in the opening, said contact member being
30 insertable in said opening through the upper end thereof and having a laterally extended portion receivable in said slot fixing the relative rotational relation of the body and contact member, laterally opposite spring portions adjacent the
35 upper end of said contact member whereby the contact member is adapted to expand under the influence of the prong to resiliently engage the prong, a depending portion of the contact member extending materially below the lower end of
40 said body after the contact member is inserted

therein from the upper end of the opening, and a lower shoulder on the contact member for engaging the body at the lower end of the opening for preventing accidental withdrawal of the member from the opening.

5 10. In a socket of the class described, the combination of a molded disc-like body of insulating material having an annular series of openings extending axially therethrough, the openings each having a portion formed to receive somewhat snugly therein a cylindrical prong of a
10 radio tube or the like, each opening having slot-like lateral extensions communicating with the prong-receiving portion of the opening at the top thereof and extending to both sides of the
15 prong-receiving portion and each having an upwardly facing shoulder therein, with a one-piece spring metal contact member received in each said opening and having a flattened portion received partially in the said lateral extensions,
20 each contact member having a resilient portion adapted to contact the prong between the said lateral extensions of the opening and to flex under the influence of the prong, the wall of the opening being relatively close to the said resilient
25 portion to limit the flexure of the resilient portion, each contact member having a preformed shoulder engaging the shoulder in the opening when the contact member is inserted therein through the top of the opening, having
30 a lower portion thereof movable laterally into position to engage the end of the body below the said resilient portion to provide engaging shoulders to prevent axial displacement of the contact member with respect to the body after
35 the contact member is inserted downwardly therein through the upper end of the opening, and having a portion positioned below said shoulders for attaching an electrical conductor thereto.

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