June 3, 1952 J. V. O'NEILL ET AL 2,598,824

ELECTRICAL SOCKET DEVICE

Filed May 1, 1948

FIG. 1

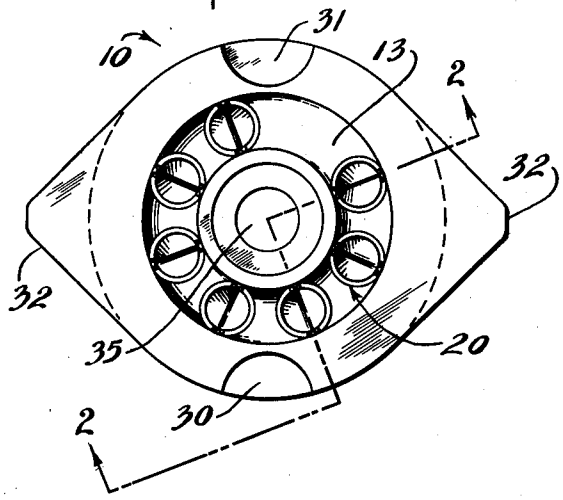
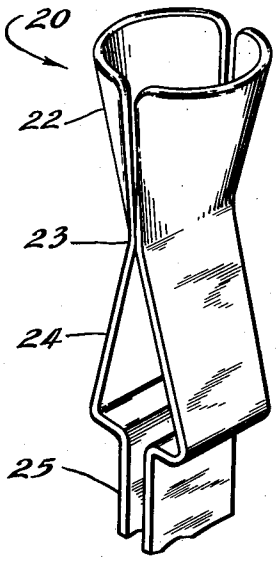


FIG. 4



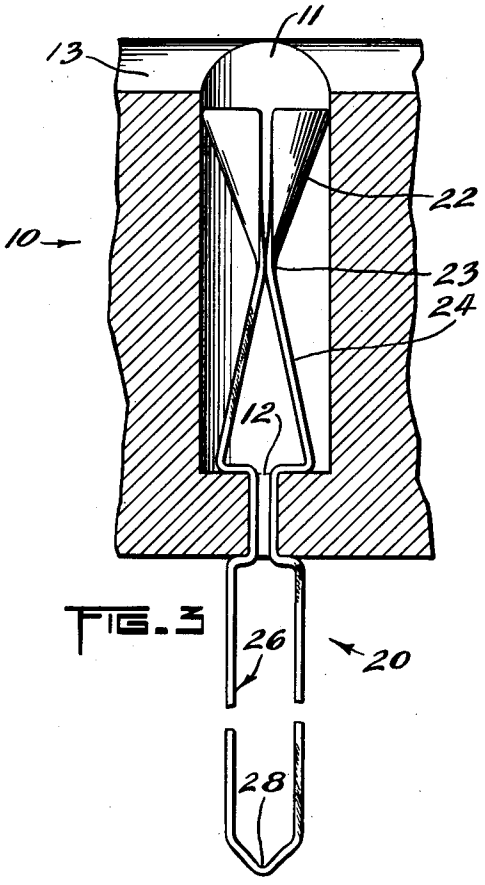


FIG. 3

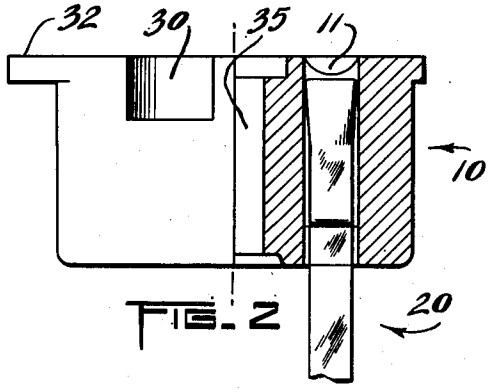


FIG. 2

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ELECTRICAL SOCKET DEVICE

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3 Claims. (Cl. 173—328)

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The present invention relates to socket contacts for plug-in electrical connector devices, and is particularly directed to sockets and contacts for pronged radio tubes and similar devices.

An object of the present invention is to provide an improved economical socket construction which may be readily assembled.

Another object of the present invention is to provide a socket construction which, with appropriate changes in size, will be suitable for use with a variety of tube styles, such as octal and loctal based tubes, miniature and sub-miniature tubes.

Still another object of the present invention is to provide improved contact that has a more durable spring action than heretofore known contact devices.

A further object of the present invention is the provision of an improved contact for socket construction which will more accurately receive the tube pins as the tube is inserted.

The foregoing objects, and others which may appear from the following detailed description, may be attained, according to an aspect of the present invention, by providing a molded socket body construction having a plurality of apertures in the socket adapted to receive conducting contacts or spring clips for the plug-in prongs of the tube. The conductive contact clips are formed of a single strip of metal bent back on itself, and having the adjacent end portions bent into an inverted generally conical formation. The upper end of the conical formation closely fits the walls of the hole in which the socket clip is mounted, so that the contact prong is guided automatically down the cone into engagement with the reduced portion of the socket clip member at the apex of the center without any tendency for the prong to be inserted between the contact clip and the wall of the hole in which the clip is mounted.

Viewed from the side, the prong engaging portion of the contact clip has a formation similar to an hour glass, the broad base of the hour glass resting against the bottom of the aperture in the socket base. It thus resists the endwise pressure thereon as the tube is inserted in the socket. The clip is maintained in the socket hole by offsets formed by spreading the looped end open. The open loop thus formed provides a soldering loop for receiving connection wires.

The present invention will be more fully understood by reference to the following detailed description which is accompanied by a drawing in which

Fig. 1 illustrates, in an enlarged plan view, a socket construction including principles of the present invention and featuring as a part thereof an improved contact clip, while

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Fig. 2 is an elevational view, partly in section, taken along lines 2—2 of Fig. 1 of the socket of Fig. 1;

Fig. 3 is an enlarged sectional view of a portion of the socket of Fig. 1 showing the details of the construction of the socket clip member, and

Fig. 4 is a perspective view of the socket clip by itself.

According to a form of the present invention, as shown in Fig. 1, the socket includes a body member 10, preferably molded of insulating material. A number of tube pin or prong receiving holes 11 are arranged in a circle about the center of the socket molding. Holes 11 do not extend clear through the molding but terminate in a narrow diametral slot 12 through which the soldering tail of the socket clip protrudes. The number, disposition, and size of the socket pin receiving holes is determined by the type of tube or other electrical device with which it is intended the socket is to be used. The socket shown in enlarged scale in Fig. 1 is intended to be used with the so-called miniature tube or T–5½ tube in which seven contact pins arranged in an eight pin circle with one pin omitted for orientation purposes are directly molded in the glass base of the tube. The tube pins are normally adapted to be plugged into a tube socket without requiring a separate base structure. If desired, the socket prong receiving holes 11 may be arranged at the bottom of an annular groove, such as that indicated by reference numeral 13, in order to more easily guide the socket pins into the proper holes. It is contemplated as being within the scope of the present invention that by suitable changes in proportions and size, the same socket construction may be used for other types of tubes.

In each of the tube pin receiving holes 11 is provided a spring contact member, or socket clip, generally identified by reference numeral 20. Preferably the socket clip includes a hollow inverted conical portion 22 superimposed on a hollow triangularly prismatic section 24, and a pair of closely adjacent extension members 25 terminating in an open loop 26 into which one may solder the associated wiring connections.

While the interior of portion 22 is generally in the shape of a hollow cone, the full width of the clip material provides a pair of extending wing portions 23 near the apex of the exterior of the cone. The hollow conical split upper portion 22 is of a diameter nearly as great as the inside diameter of the socket pin receiving hole 11, as is the tip to tip dimension of wings 23, so that there is no possibility of the contact pin of the tube or other device which is to be plugged into the socket being forced between the contact clip and the wall of the hole 11. A hollow triangularly prismatic section 24 provides a firm founda-

tion against the bottom of hole 11 and provides further spring action for the upper portion of the socket clip. The base of the triangular portion 24 rests against the bottom of the hole 11 and thus resists end-wise pressure when the tube is being inserted. The parallel portions 25 of the socket clip are closely adjacent and nearly fill the narrow diametral slot 12 at the bottom of the hole 11. After the clip is inserted, the parallel portions 25 are spread apart by a wedging instrument thus providing an open loop portion 26. The spread loop maintains the socket clip against undesired displacement, and also provides an open loop well adapted to receive wires which may be soldered therein.

Preferably the socket clip is formed of a narrow elongated strip metal bent over on itself at point 28 and having the conical and triangular portions each formed in a complete half on one of the legs of the bent over portion. Preferably, the elongated line contact portion between the hollow conical part of the socket clip and the hollow triangular portion is arranged radially in the socket molding.

While any one of a number of different ways may be employed to fasten the socket into the chassis of a radio set or other places where it is desired to mount the socket, a preferred arrangement involves the generally semicircular niches 30 and 31 at the sides of the base molding, together with the extending ear portions 32. Niches 30 and 31 terminate in a plane lower than that of the under surface of ear portions 32 by the thickness of the panel or chassis in which the socket is to be mounted. A hole is provided in the chassis of a diameter sufficient to accept the body of the socket but not to pass the ears 32. The tube socket may slip into the chassis hole until the ears rest against the top surface of the chassis. Then the metal of the chassis may be expanded into the nitches 30 and 31. Thus, the socket is held against being lifted up out of the chassis hole, and as well maintained against accidental rotation.

In the socket as described above, a central aperture 35 may be provided to carry a tubular metal member for shielding the socket clips, one from another. Alternatively, the central aperture may, for octal based tubes, be provided with a key slot for proper orientation of the tube or a lock-in contact member for lock-in tubes.

What we claim is:

1. A radio tube socket including a body member of insulating material, said member having a number of cylindrical, tube-pin-receiving holes extending partially through said body from one end, said holes terminating in an end wall having a restricted aperture therein extending to the other end of said body, and a contact clip in each of said holes, said clip being in the form of an elongated strip of metal bent over on itself to form a pair of closely adjacent legs, the end portion of said legs being formed into a split hollow circular formation having its interior tapering away from said end and the next adjacent portion of said legs formed into a hollow triangle with the base of said triangle remote from said end and resting against the end wall of the hole, the rim of said circular formation contacting the major part of the circumference of the hole adjacent said one end of said body and means extending through said restricted aperture for securing said clips in said holes and making electrical connection to said clips.

2. A radio tube socket including a body member of insulating material, said member having a number of cylindrical, tube pin receiving holes extending partially through said body from one end, said holes having restricted substantially diametral slots extending to the other end of said body, and a contact clip in each of said holes, said clip being in the form of an elongated strip of metal bent over on itself to form a pair of closely adjacent legs, the end of said legs being formed in a split hollow substantially conical formation, the base thereof being at the end of said legs, the next adjacent portion of said legs bounding a hollow triangular formation with the apex thereof joined to the apex of said conical formation, the base of the conical portion closely contacting the major part of the circumference of the hole adjacent said one end of said member, the base of said triangular formation resting against the bottom of the cylindrical hole and the remainder of said strip extending through said slot to said other end of the base member to form a connecting tab.

3. A radio tube socket including a body member of insulating material, said member having a number of cylindrical, tube-pin-receiving holes extending partially through said body from one end, said holes terminating in an end wall having restricted apertures extending to the other end of said body, and a contact clip in each of said holes, said clip being in the form of an elongated strip of metal bent over on itself to form a pair of closely adjacent legs, each of the ends being formed into a hollow hemi-conical formation having its base at the end of the leg and the hollows facing one another, there being tapered diametrally opposing wings at the edges of said conical formations whereby the width of said legs at the apex of the conical formation is not reduced, the next adjacent portions of said legs being formed into a hollow triangle with the apex of said triangle at the apex of the conical portion, the base of said hemi-conical portions being adjacent said one end of said body member and the bases of said hemi-conical portions together contacting the major part of the circumference of the hole and the remainder of said strip extending through said restricted aperture to the other end of the base member to form a connecting tab.

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