

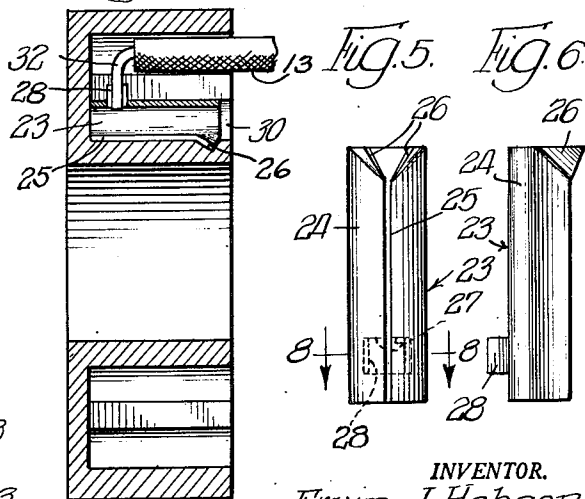
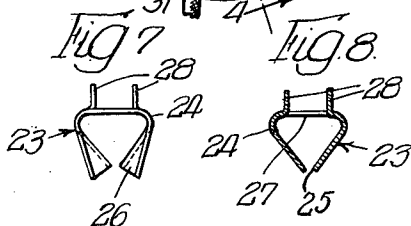
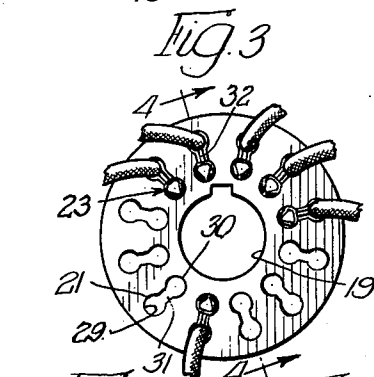
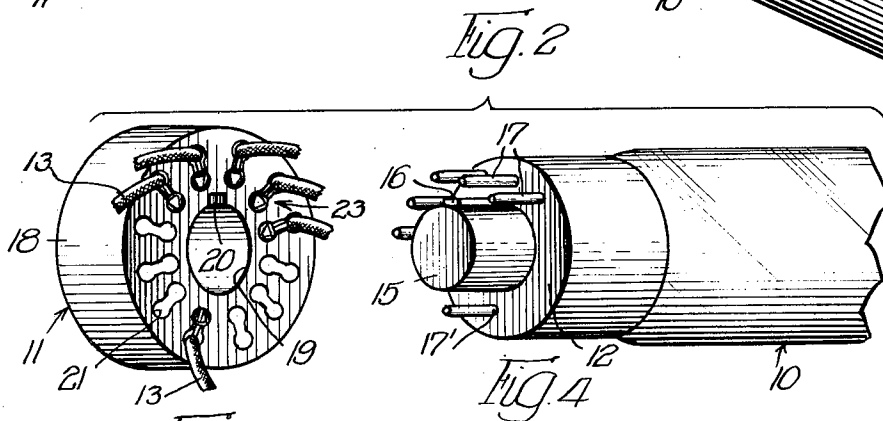
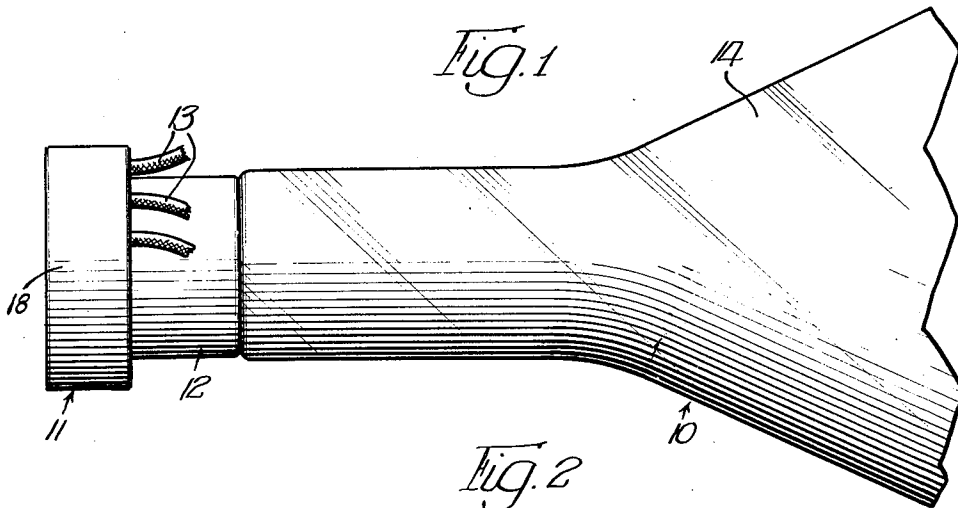
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SOCKET CONSTRUCTION FOR ELECTRONIC DEVICES

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SOCKET CONSTRUCTION FOR ELECTRONIC DEVICES

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4 Claims. (Cl. 339—193)

The present invention pertains to an improved socket construction for electronic devices such as television picture tubes, amplifier and other type tubes, and related units which are mounted by a pin and socket connection. Although the improved construction has particular utility in connection with a picture tube equipped with an external coil, which coil is to be electrically connected to electrode means within the tube envelope, the improvements are by no means limited to such an external coil installation. On the contrary, they have quite wide adaptability for association with any electronic device of the type having electrical connector prongs or pins which it is desired to removably engage with a female socket receptacle.

It is an object of the invention to provide an improved socket construction for such a device in the form of an insulating base having means for unvaryingly receiving the base of an electronic or equivalent element in a predetermined telescoped and angularly oriented relation, which base is provided with a series of circumferentially arranged socket recesses of a particular outline, together with improved sleeve-like socket contacts mounted in said recesses to receive with improved electrical efficiency the contact pins of the electronic or equivalent element.

More particularly, it is an object of the invention to provide a socket construction of the foregoing type in which the socket base is fabricated of a material having high dielectric value and is provided with one or more specially shaped socket recesses extending from one face thereof only partially therethrough, and in which split tubular contact sleeves are inserted in the recess or recesses and firmly anchored therein by means of a special locking prong adjoining the split and embeddingly engaging the base.

Yet another object is to provide a socket construction of the sort described in the preceding paragraph, in which the socket recess has a lateral extension in restricted communication therewith to receive an insulated lead wire, and in which the terminal of the wire is passed through the restriction, being engaged with the contact sleeve adjacent the rear of the recess.

A still further object is to provide a multiple contact socket construction of the foregoing description in which the contact sleeves referred to are of a size, shape, number and circumferential spacing to frictionally receive any number of contact pins with complete insurance against short circuiting.

A still further object is to provide an improved conducting socket sleeve for a socket construction as aforesaid, which sleeve is elongated and of generally triangular cross section outline, and is longitudinally slit to enable the same to frictionally engage a contact pin or prong under substantial spring tension, the sleeve being further provided with laterally spread anchoring points at one extremity and adjoining the split thereof which embeddingly engage a socket base recess into which the element is inserted.

The foregoing statements are indicative in a general way of the nature of the invention. Other and more specific objects will be apparent to those skilled in the art upon a full understanding of the construction and operation of the device.

A single embodiment of the invention is presented herein for purpose of illustration, and it will be appreciated that the invention may be incorporated in other modified forms coming equally within the scope of the appended claims.

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In the drawings,

Fig. 1 is a fragmentary view in side elevation showing the improved socket with the base of a conventional television picture tube mounted in operative relation thereto;

Fig. 2 is a fragmentary exploded perspective view further illustrating the meeting faces of the socket and tube base, together with the electrical socket connections and the base contact pins associated respectively therewith;

Fig. 3 is a front view of the inner face of the socket, generally indicating the relationship of certain conducting leads, the socket base and the improved socket elements of the construction;

Fig. 4 is an enlarged view in longitudinal section through the axis of the socket, on a line corresponding to line 4—4 of Fig. 3, more clearly illustrating the specific relationship of wire lead, socket sleeve element and socket base;

Figs. 5 and 6, are, respectively, face and side elevational views of the improved socket sleeve, per se;

Fig. 7 is a top plan view of the socket sleeve and its integral struck out anchoring provisions; and

Fig. 8 is a view in transverse section through the socket sleeve along lines 8—8 of Fig. 5, showing a further detail of the socket element.

Fig. 1 illustrates generally an electronic cathode ray tube or picture tube 10 of the electrostatic type. It is for the purpose of furnishing voltage to the internal electrodes of a tube of this sort, or in fact to any known type of evacuated or gas filled electronic tube, or equivalent element, that the improved socket construction of the invention is intended. The socket construction is generally designated 11 and is shown in Fig. 1 in operative tube mounting relation to the usual base assembly 12 of such a tube, whereby to furnish an energizing voltage from an external source or sources through insulated conducting leads 13 to certain electrodes and the like (not shown) which are disposed in entirely conventional arrangement within the envelope 14 of tube 10. It is evident that the socket construction 11 is also well adapted for the mounting of condensers and other electrical devices, in addition to electronic tubes.

As illustrated in Fig. 2, the base assembly 12 of tube 10 is of a well known design. It is provided with an integral central, axially extending pilot post or stud 15 of generally cylindrical outline, which stud in turn carries an elongated, integral positioning key 16 paralleling its axis. Conducting contact prongs or pins 17 are provided on base 12 in predetermined circumferential arrangement, in accordance with the particular type of tube or other unit 10 which is involved. These matters are well understood by those skilled in the art.

The socket construction 11 includes an annular base ring or body 18 of insulating material, the bore 19 of which is of sufficient diameter to frictionally receive the stud 15 of tube 10 with a snug though readily removable fit. Bore 19 is provided with a keyway 20 of a size to similarly receive the key 15. The engagement of key and keyway predeterminedly orients the tube prongs 17 relative to socket 11, in the angular sense.

Socket base ring 18 is provided with a series of circumferentially spaced recesses 21 of special outline. In the illustrated embodiment these are in a number in excess of the number of actual socket connections which are required for the servicing of tube 10. Thus a standard socket, recessed in uniformly spaced circumferential order, is adapted to the socket requirements of different tubes or other devices in which, as indicated above, the number and arrangement of connector prongs 17 is apt to vary. It happens that the tube 10 which is illustrated has a base prong, specially designated 17', which is intended to handle heavy wattage, hence this prong is spaced substantially from the other prongs 17 and the socket contact sleeve receiving the same, to be described, will be correspondingly spaced from other sleeves.

Figs. 2 and 3 show an illustrative installation involving a relatively large number of recesses 21 in the base ring 18, uniformly spaced in the circumferential sense and only part of which are occupied by socket contacts. This is one of the features of the invention. However, the particular number of recesses 21 which are selected

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for use in any given installation, and the relative circumferential spacing of the socket sleeves in the selected recesses, are not factors in the present invention. Other than in the provision of an excess of socket recesses, the invention concerns itself solely with structural details of the base ring 18, the socket sleeve elements to be described, and the relationship of these parts relative to one another.

The socket sleeves, generally designated by the reference numeral 23, are illustrated in Figs. 5 through 8, and their installed relation to socket base ring 18 is shown in Figs. 2, 3 and 4. Each thereof is in the form of an elongated tubular conducting member, preferably fabricated of a rectangular blank of spring brass about .010 inch thick, the sleeve member having a cross sectional shape which is approximately an equilateral triangle, see Figs. 7 and 8. Opposed edges of the blank which forms the body 24 of the sleeve are separated throughout its length by a longitudinal slit 25 coinciding with an apex of the triangular section. The extreme upper portions of the body adjoining the slit 25 are spread outwardly to provide divergent prong guide and sleeve anchoring ears 26, one on either side of the slit 25. The latter renders body 24 flexible and spring-like in character. The internal spacing of its three walls is such that it has a close frictional fit about the pins or prongs 17 or 17', thus exerting a very snug frictional grip on the prong and constituting a very efficient electrical contact or connection therebetween.

On the side thereof opposite the slit or split 25, the body 24 of socket sleeve 23 is slitted at 27 in an H-shaped outline to permit small lugs 28 to be bent outwardly in opposed parallel relation to one another. These lugs are adapted to be clamped or soldered to the stripped end 32 of the insulated lead or conductor wire 13.

The socket base ring recesses 21 are of double-ended or "dumbbell" shaped outline, including enlarged, generally circular outer and inner end portions or bays 29, 30, respectively, and a connecting slot 31 which is of restricted width, as illustrated in Fig. 3. Recesses 21 are preferably arranged radially of the socket ring bore 19. The depth thereof is less than the face-to-face thickness of the base ring, as illustrated clearly in Fig. 4, and the sleeves 23 have a length less than the depth of the recesses. They are thrust into the innermost portion 30 of the latter, with slit 25 facing inwardly, until they engage the bottom of the respective recesses. Conductor 13, secured by its stripped end 32 to the sleeve, is inserted in the outer bay 29 of the recess and the stripped end extends through the intermediate slot 31 of the recess. This slot may also accommodate the lugs 28.

In assembling the sleeves 23 to base ring 18 the former exert substantial friction against the wall of the recess bay 30 as the elements are thrust longitudinally into abutment with the base of the recess. When fully inserted, the resilient, pointed guide and anchoring ears 26 tend to expand and embed themselves in the material of base ring, and when the tube base prongs 17, 17' are initially inserted into the respective socket sleeves, these ears are forced even more strongly into embedded relation to the base. By the same token the effectiveness of the frictional grip maintained on prongs 17, 17' by the sleeves is enhanced by the embedded relation, tending to compress the resilient split sleeve section.

In addition to anchoring the sleeves, ears 26 function as spread out guides to facilitate the entry of prongs into proper electrically conducting relation to the socket elements.

The foregoing construction provides a socket of wide utility, featuring an arrangement in which the leads connected to the socket contacts are led into the socket base from the same direction that the prongs of the tube 10 are inserted. The unit is very compact and inexpensive, in that the sleeves 23 may be very inexpensively formed and assembled to base ring 18 by mass production machinery, and it enables any desired socket sleeve spacing to be set up at will. When properly assembled as described, the embedded sleeves 23 are in what amounts to a unitary relation to the insulating base, for a very efficient electrical contact with the prongs 17, 17'.

I claim:

1. A socket construction comprising an insulating support of integral, one-piece construction and of annular shape and predetermined thickness, said support having

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a recess extending from one axial side face thereof only partially therethrough, said recess being of uniform cross sectional outline throughout the axial length thereof and comprising laterally spaced, enlarged end portions and an intermediate portion of restricted width communicating said end portions with one another, an elongated contact sleeve frictionally engaged over a substantial part of the length thereof in one end portion of said recess, said sleeve extending into said recess substantially the entire length thereof, an electrical conductor arranged in the other end portion of said recess with the terminal thereof disposed in the intermediate portion of the recess, and means securing said terminal at its end in electrical contact with said sleeve, the material of said support sealing off the end of said recess adjacent said conductor end.

2. A socket construction comprising an insulating support of integral, one-piece construction and of annular shape and predetermined thickness, said support having a recess extending from one axial side face thereof only partially therethrough, said recess being of uniform cross sectional outline throughout the axial length thereof and comprising laterally spaced, enlarged end portions and an intermediate portion of restricted width communicating said end portions with one another, an elongated contact sleeve of longitudinally split cross sectional outline which is frictionally engaged over a substantial part of the length thereof in one end portion of said recess, said sleeve extending into said recess substantially the entire length thereof, an electrical conductor arranged in the other end portion of said recess with the terminal thereof disposed in the intermediate portion of the recess, and means securing said terminal at its end in electrical contact with said sleeve, the material of said support sealing off the end of said recess adjacent said conductor end.

3. A socket construction comprising an insulating support of integral, one-piece construction and of annular shape and predetermined thickness, said support having a recess extending from one axial side face thereof only partially therethrough, said recess being of uniform cross sectional outline throughout the axial length thereof and comprising laterally spaced, enlarged end portions and an intermediate portion of restricted width communicating said end portions with one another, an elongated contact sleeve of longitudinally split cross sectional outline which is frictionally engaged over a substantial part of the length thereof in one end portion of said recess, said sleeve extending into said recess substantially the entire length thereof, said contact sleeve being provided with an outwardly divergent anchoring element adjacent the split therein which has embedding engagement with the material of said support, an electrical conductor arranged in the other end portion of said recess with the terminal thereof disposed in the intermediate portion of the recess, and means securing said terminal at its end in electrical contact with said sleeve, the material of said support sealing off the end of said recess adjacent said conductor end.

4. A socket construction in accordance with claim 1, in which said electrical conductor is received in said other recess end portion from the face of said support to which said recess opens.

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