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SOCKET FOR ELECTRICAL DEVICES

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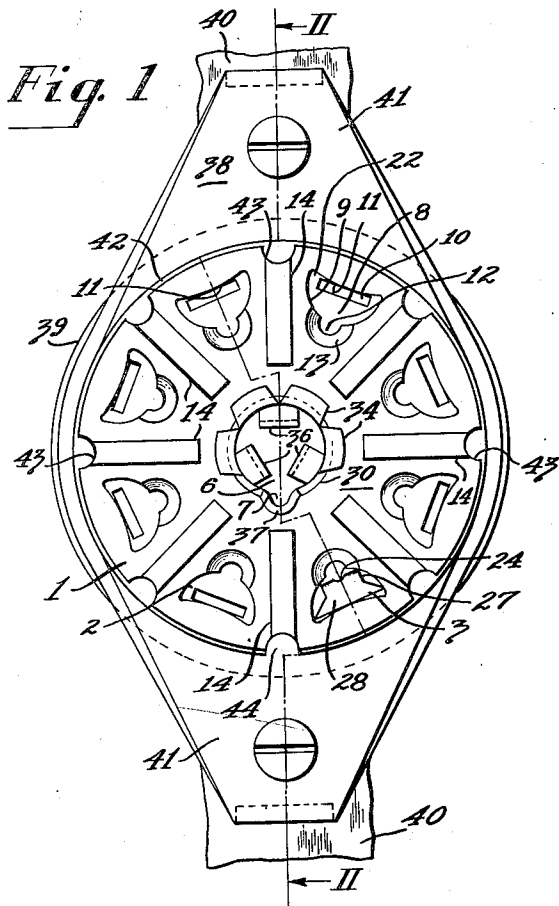
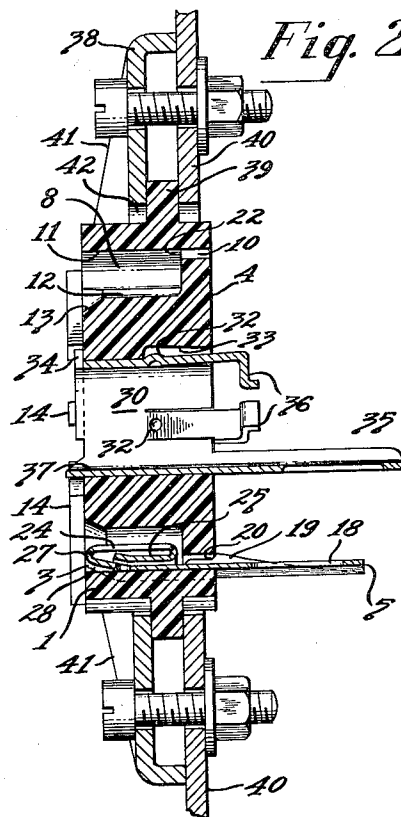
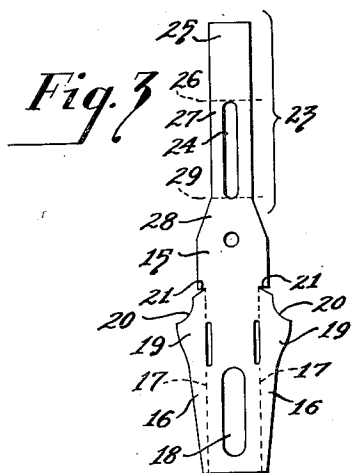
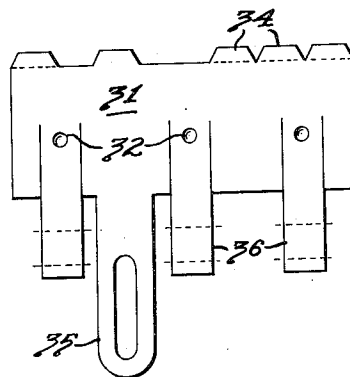


*Fig. 4*



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## SOCKET FOR ELECTRICAL DEVICES

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3 Claims. (Cl. 173—328)

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This invention relates to sockets for electron discharge tubes and the like having contacts projecting therefrom, and the invention relates especially but not exclusively to sockets for discharge tubes of the kind in which the contacts comprise rigid pins sealed to the vitreous base of the tube, as distinct from the more widely known contact pins which comprise resilient sleeves to which the leads of the electrodes of the tubes are connected. The object of the present invention is to provide an improved socket such as used in radio receivers for receiving the valves thereof, the socket being simple to manufacture and to assemble.

According to the present invention there is provided a socket for electron discharge tubes and the like having contacts projecting therefrom, comprising an insulating base having a plurality of apertures for receiving said contacts and having a contact element in each of said apertures to which a lead can be connected, wherein each of the contact elements is provided with a resilient portion which is accommodated in said aperture and arranged to face the wall of said aperture so that when a contact of suitable size is inserted in said aperture said contact is engaged by said resilient portion and tends to be resiliently urged towards the wall of said aperture. The invention makes possible a simple construction for the contact elements since the resilient portion of each contact element may comprise a length of resilient material which is folded upon itself.

In order that the said invention may be clearly understood and readily carried into effect, the same will now be more fully described with reference to the accompanying drawings, in which:

Figure 1 is a top plan view on an enlarged scale of a valve socket in accordance with the present invention, and showing also an attachment member for securing the socket in position.

Figure 2 is a sectional elevation on the line II—II of Figure 1.

Figure 3 is a plan view of a metal blank such as employed to make the contact elements for the socket, and

Figure 4 is a plan view of a metal blank such as employed to make the central sleeve for the socket.

Referring to the drawing, the socket comprises an insulating base 1 pressed from a suitable plastic, said base having a plurality of circularly-arranged apertures 2 in each of which is disposed a contact element 3, only one of the contact elements being shown, for the sake of clearness.

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The contact elements are retained in the apertures 2 and project beyond the lower surface 4 of base 1 so as to constitute tags 5 to which leads to said contact elements can be soldered. The socket illustrated is designed for use with pressed glass base valves, the base of the valve having a central spigot which may have a longitudinal rib, and the socket is provided with a central aperture 6 for receiving the spigot and having a longitudinal groove 7 therein so that if the valve spigot is provided with a rib, said rib will co-operate with the groove 7 to ensure proper orientation of the valve in the socket.

The apertures 2 formed in said base for the reception of the contact elements 3 are in the example illustrated of a substantially semi-circular shape in cross-section at their upper ends 8, with the arcuate walls 9 innermost, i. e. towards the centre of said base, but the apertures may have another, but preferably an equivalent shape such as rhomboidal or truncated triangular shape. At their lower ends 10 said apertures are of rectangular form with the minor axis radially arranged with respect to the centre of said base, these rectangular ends receiving the ends of said contact elements which project through said base. The outer wall 11 of each upper end 8 of said apertures is preferably slightly convex as shown, or it may be provided with a central longitudinal rib. The arcuate wall 9 of each of said apertures is provided with a longitudinal groove 12 of a size sufficient to receive the contact pin on the valve and to afford sufficient tolerance to accommodate inaccuracies in manufacture of the valve. The upper ends of each groove 12, i. e. at the surface of said base where the contact pins are inserted are countersunk as shown at 13 so as to guide the contact pins into the grooves 12. Between each of the apertures 2, on the upper surface of said base radially-disposed ribs 14 may be provided so as to increase the leakage path between the contact elements when the latter are assembled in said base.

The contact elements 3 are formed from stampings 15 (Figure 3) of thin brass or other suitable material and the flat blanks from which the contact elements are made are generally of a somewhat rectangular form, one end of each blank being formed with flanges 16 which are folded over at the dotted lines 17 towards each other so as to form an end portion or tag 5 which is relatively rigid and of a shape to pass through the rectangular ends 10 of the apertures in said base, but to be a close fit therein. The flanges

have projecting wings 19 which, when the contact elements are inserted into the apertures 2 from the upper surface of the base 1 with the flanges folded over, are arranged to pass out of the lower ends 10 of the apertures 2 and thereupon spring slightly apart (as indicated in Figure 2), engaging the lower surface 4 of the base 1 and thereby holding the contact elements in position. The end portion 5 of each of the contact elements 3 is provided with a longitudinal slot 18 through which a lead can be passed and soldered to said end after the contact elements are assembled in said base 1. When the flanges 16 are folded over as above-mentioned, shoulders 21 are formed on each contact element, said shoulders being adapted to be seated on shoulders 22 formed in the apertures 2 in the base 1 where the apertures change from their semi-circular cross-section to their rectangular cross-section. In addition the upper edges 20 of the wings 19 which edges engage the lower surface 4 of the base 1, are arcuate as shown in Figure 3, so that as the wings 19 spring apart they pull the shoulders 21 firmly against the shoulders 22, and hold the contact elements 3 firmly in position, even though the depths of the ends 10 of the apertures 2 may not be equal in all cases. From the shoulders 21 each contact element tapers down to a rectangular portion 23 and between the tapered portion and the end of said rectangular portion a longitudinal slot 24 is provided. The end 25 of said rectangular portion is then bent over the longitudinally slotted portion 27 at the line 26, and then the portion 27 is bent over the tapered portion 28 at the line 29 so that the portion 23 then has the configuration shown in Figure 2. Alternatively a single loop may be formed by folding over the end of said rectangular portion. When the contact elements 3 are inserted in the apertures 2 the longitudinal slots 24 face the longitudinal grooves 12 provided in said apertures. The folded-over end portion 25 of the each contact element bears against the aforesaid tapered portion 28 and affords a degree of resiliency so that when the contact pin on the valve is inserted it is engaged by the slotted portion 27 and tends to be resiliently urged against the wall of the longitudinal groove 12. The tapered portion is preferably bent as shown in Figure 2, at an angle of about 30° with the longitudinal axis of the contact element. In order to assemble the contact elements 3 in the base 1 it is merely necessary to pass the contact elements 3 through said apertures 2, the end portions which form the contact tags 5 passing through the rectangular portion 10 of said apertures, until stopped by inter-engagement of said shoulders 21 and 22. The convex walls 11 of the apertures 2 or said longitudinal ribs thereon, provide fulcrums about which the contact elements 3 can rock, as can be seen in Figure 1, to accommodate contact pins which are angularly misplaced, said tapered portions 28 allowing such pivoting movement to occur. When a valve is inserted in the socket the valve pins are accommodated in said longitudinal grooves 12 and engage the edges of the longitudinal slots 24 in the contact elements, the portions 25, 27 and 28 which are folded over being such as to afford a required amount of pressure between the contact elements and the valve pins. Since the latter engage the edges of said longitudinal slots 24 a self-cleaning action occurs.

The central aperture 6 in said base 1 is preferably provided with a contact-making element

30 which comprises a sleeve made of brass or other suitable material, the sleeve being formed from a flat blank 31 (see Figure 4) bent to a substantially circular form and of such a size that when inserted in said central aperture it requires to be compressed so as resiliently to hold said sleeve in said aperture. If desired, protuberances 32 may be pressed in the wall of said sleeve, said protuberances being received in suitable slots or recesses 33 formed in the wall of the central aperture 6. The upper end of said sleeve is provided with a series of lugs 34, or may alternatively be provided with a flange, which limits the movement of said sleeve through said central aperture, whilst the other end of said sleeve may be provided with a soldering tag 35 and with one or more arms 36 which are bent so as to project towards the centre of said central aperture and thereby ensure good contact between said sleeve and a valve provided with a metal spigot. In the example illustrated the sleeve is provided with a longitudinal groove 37 corresponding to the groove 7 in the aperture 6 for receiving the longitudinal rib on the spigot of the valve.

The base 1 may be provided with suitable ears whereby it can be secured to the chassis of a radio receiver or, alternatively, said base may be secured in position on the chassis of a receiver by a separate attachment member 38 which is illustrated in position in Figures 1 and 2. In this latter case, said base may be provided around its periphery and intermediate the upper and lower surfaces thereof, with a circular flange 39 which is adapted to be seated on the chassis of the receiver indicated at 40 in Figure 2 and said attachment member 38, as illustrated, comprises a metal plate having a pair of ears 41 by means of which it can be screwed or otherwise secured to the chassis 40 and with an aperture 42 through which the upper surface of said base passes. With this construction the periphery of said base may be provided with a series of axial grooves 43 and said securing member 38 may be provided with a projection 44 so that, if desired, said base can be orientated in steps of for example 45° with respect to said attachment member, the base being prevented from rotation when said securing member is screwed down to the chassis by the projection 44 engaging one of said axial grooves 43.

What we claim is:

1. A socket for an electrical device comprising an insulating base having a passageway extending therethrough, said passageway adjacent one face of said base having a relatively large cross section, and adjacent the opposite face a relatively small cross-section, and an elongated removable contact member extending through said passageway, said member including an end portion folded upon itself along two lines normal to the longitudinal axis of said member with the end of said end portion lying between another portion of said member and the inner face of one of said folds, said folded end portion extending to said one face of said base and forming a resilient socket with a portion of a wall of said passageway for receiving a contact pin, whereby said end is displaced from contact with said pin to protect said end of said contact from excessive wear, the other end portion of said member having wings on opposite sides thereof foldable along lines parallel to the longitudinal axis of said member for stiffening said other end portion and for permitting entrance thereof through said passageway when said wings are folded to-

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ward each other, and for fixing said member in said passageway when said wings are at least partly unfolded.

2. A socket for an electrical device comprising an insulating base having plurality of passageways therethrough, each of said passageways being formed by walls spaced differently from each other at two portions of said passageways adjacent opposite faces of said base, whereby said passageways are wider adjacent one face of said base than adjacent the opposite face thereof, and a contact member extending through each of said passageways, one end portion of said member being doubly folded upon itself along lines extending transversely of said member and being disposed in the wider portion of said passageways for forming a resilient socket for receiving a contact pin of said device, the other end portion of said member having lateral wings foldable toward each other to lie flat against said member for insertion of said member through the narrower portion of said passageways, said wings being urged to unfolded position for engaging an edge of said passageways for fixing the position of said member in said passageways.

3. A socket for an electrical device comprising an insulating base, having a plurality of passageways therethrough, a portion of each of said passageways being defined by a plurality of curved walls including a concave wall and a convex wall opposite said concave wall, and a contact member extending through each of said passageways, said contact member including an end portion folded twice upon itself in the same direction and disposed in said portion of said passageways with the outer surface of the folded portion facing said concave wall end forming therewith a resilient receptacle for a contact pin of said device, said member engaging said con-

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vex wall for rocking movement thereon on a longitudinal axis of said member to accommodate said member to an angularly disposed pin of said device, said contact member including another end portion foldable upon itself in two separate folds along two lines parallel to the longitudinal axis of said member for restricting the lateral extent of said last-named end portion when extending said member through said passageways, said last-named end portion being urged to unfolded position for fixing said member in said base.

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