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VACUUM TUBE SOCKET

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Fig. 1.

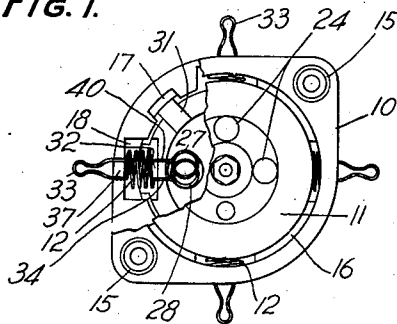


Fig. 2.

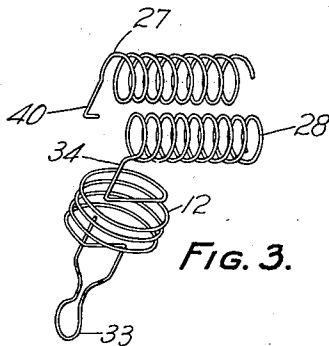
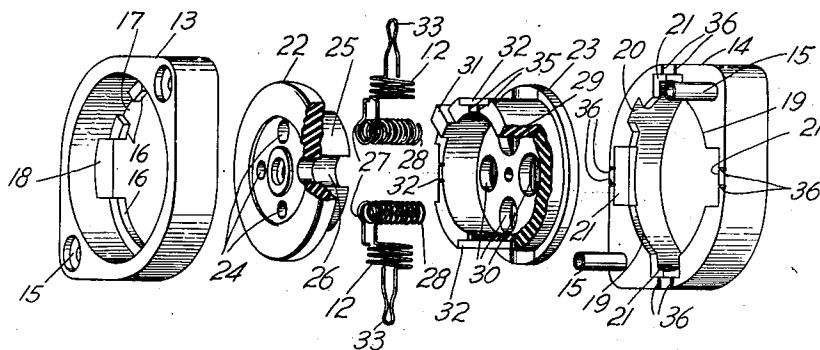
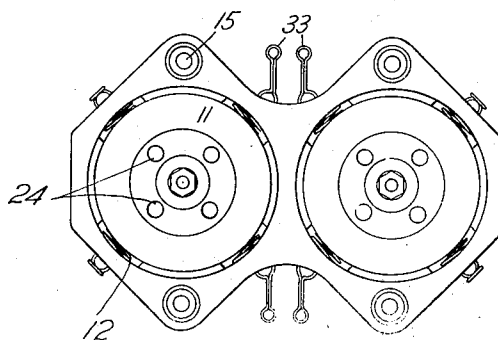


Fig. 4.



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VACUUM TUBE SOCKET

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6 Claims. (Cl. 173—328)

This invention relates to vacuum tube sockets and more particularly to sockets of the cushion type.

An object of this invention is to prevent external shock or vibration varying the relationship of the electrodes in a vacuum tube when in operation.

In accordance with this invention the vacuum tube socket comprises a stationary portion, and a movable portion resiliently supported within the stationary portion. This is accomplished by cushion springs extending radially between the movable portion and the stationary portion. The movable portion has the usual apertures to receive the prongs of the vacuum tube and these apertures communicate with chambers in which pairs of intermeshed spring contacts are located to engage the surface of the terminal prongs. One of each pair of spring contacts is formed integrally with an associated cushion spring which is also provided with an integral termination which projects from the stationary portion to form the terminal connection.

A feature of the invention relates to limiting means for preventing excessive movement of the movable portion of the socket in a vertical or rotational direction. This arrangement comprises integrally cooperating flanges upon the movable and stationary portions which limit the downward thrust and upward pull exerted on the movable portion. The twisting or rotating movement of the movable member is substantially limited by a projecting member on the movable portion located in a guide-way on the stationary portion of the socket. This arrangement provides a compact and efficient shock absorbing socket which may be quickly and easily assembled without resorting to soldering operations. Furthermore, the limiting features of this socket eliminate excessive strain on the spring cushions thereby reducing breakage and replacement of these elements.

The various features of the invention will be apparent from the following detailed description with reference to the accompanying drawing.

Fig. 1 is a plan view of the socket made in accordance with this invention, with a portion broken away to show the spring contacts and the cushion portion;

Fig. 2 is an exploded view of the socket showing clearly the various parts comprising the device;

Fig. 3 is an enlarged detail view showing the helical contact springs and illustrating the manner in which the cushion portion and extension for external connection to the contact member are formed integrally with one of the helical contact members; and

Fig. 4 is a plan view of a multi-unit socket embodying the various features of the invention.

Referring to Fig. 1, there is shown a socket comprising a stationary portion 10 and a movable portion 11 mounted therein through the agency of helical cushion springs 12. The stationary and movable portions are formed preferably of insulating material, as for example phenol condensation product, hard rubber, or the like. The stationary portion 10 is preferably formed as shown to minimize space requirements and to facilitate the adaptation of the device to portable radio and similar equipment wherein space is a dominating factor, although the invention may be applied to a socket used for general purposes.

The stationary portion 10 consists of two cooperative sections 13 and 14 having a large central opening, for accommodating the movable portion 11, and are secured together by eyelets 15 at opposite ends. The upper section 13 is provided with an integral flange 16, projecting into the large central opening from the lower surface thereof. The flange 16 is cut away at 17 to form a guiding slot and a plurality of recesses or pockets are formed at equal spaced positions of the flanged section 13, only one of the recesses being shown at 18. The section 14 is provided with a flange 19, on its upper surface which is cut away at 20 and is also provided with recesses or pockets 21. When the two parts 13 and 14 are fastened together the flanges 16 and 19, the slots 17 and 20, and the recesses 18 and 21, respectively, are in alignment.

The movable portion 11 likewise comprises two cooperating sections 22 and 23, which are held together by a nut and bolt passing through the center. The section 22 consists of a molded flanged plug member which is provided with apertures 24 to receive the prongs of a vacuum tube or other electrical device and embodies a projecting portion 25 having recesses 26 concentric with the apertures 24 and of such dimensions as to partially enclose the intermeshed helical contact members 27 and 28 which will be described more in detail hereinafter. The cooperating section 23 consists essentially of a disc portion and a hollow cylindrical portion 29 formed integrally therewith, the hollow portion 29 forming an enclosure for the recessed portion 25 of the section 22. The inner surface of the disc portion is provided with a plurality of indentations or receptacles 30 in which the contact members 27 and 28 are seated when the movable portion 11 is assembled. The cylindrical portion 29 has a longitudinal projecting ridge 31 integral therewith which fits loosely into the guide slots 17 and 20 of the stationary portion 10. The upper end of the ridge 31 cooperates with a groove (not shown) in the section 22 so as to axially align the recesses 26 and the receptacles 30 when the sections 22 and 23 are placed together. The cylindrical portion 29 is also pro-

vided with longitudinal recesses 32 on the outer surface which are in alignment with the receptacles 30 in the disc portion 23. Furthermore, the cylindrical portion 29 is made of such height that when the complete socket is assembled the disc portion of the section 23 and the top portion of the section 22 will be located in the central opening of the sections 13 and 14 and positioned on opposite sides of the flanges 16 and 19 on the stationary portion 10.

The combined contact and resilient supporting member is shown in Fig. 3 and comprises an independent helical spring 27 having a bent termination 40, and a similar helical spring 28 having a large diameter cushion helical spring 12 and an extended loop terminal 33 bent at right angles to the spring 28. The independent helical spring 27 is intermeshed with the spring 28, as shown in Fig. 1, to form a substantially elliptical opening to accommodate a prong of a vacuum tube or other electrical device. In the assembly of the device the intermeshed springs 27 and 28 are seated in the receptacles 30 within the section 23 of the movable portion and the bent termination 40 and the connecting wire 34 fit into guide slots 35 in the upper surface of the cylindrical portion 29. The plug member 25 having the recesses 26 is fitted into the hollow cylindrical portion 29 to separate the helical contacts and form individual compartments for the intermeshed springs. When the helical contacts are enclosed within the sections 22 and 23 of the movable portion 11 the resilient springs 12 are located in the recesses 32 of the movable portion 11 and the cooperating recesses 18 and 21 cut into the inner surfaces of the sections 13 and 14 respectively of the stationary portion 10. The parallel wires of the terminal 33 are also located in the slots 36 of the section 14 as shown at 37 in Fig. 1. Fig. 4 illustrates a double form of socket which is adapted for use where space is limited. Of course, it is understood that gangs of three or more sockets may be combined in a unitary arrangement. The intermeshed helical springs insure a large and positive contacting surface for the prongs of a vacuum tube or other electrical device and the resilient springs between the movable portion and the stationary portion cushion the vacuum tube supported in the movable portion of the socket. Furthermore, the cooperating flanges and guides on the two portions of the device limit the optimum movement of the movable portion so that the combination contact and cushion springs are not subjected to strain.

It is readily seen that the sensitive elements of a vacuum tube are amply protected against shocks and jars and the movable portion is prevented from displacement in any direction.

What is claimed is:

1. A socket for electron discharge devices comprising a stationary portion, a movable portion therein, a plurality of contact members carried by said movable portion, and means for preventing lateral contact between said stationary and movable portions including a helical spring integral with each of said contact members positioned between juxtaposed longitudinal walls of said stationary portion and said movable portion, the longitudinal axis of each spring being disposed radially with respect to said movable portion.

2. A holder for electron discharge devices comprising an apertured stationary portion, a movable portion within said stationary portion having a plurality of spaced apertures therein, helical contact members enclosed in said movable por-

tion, said members being intermeshed to form an opening extending lengthwise of said members and being in alignment with the apertures in said movable portion, a cushioning member formed integrally with certain of said contact members and disposed between juxtaposed vertical portions of said stationary and movable portions with its longitudinal axis extending radially between said movable portion and said stationary portion, means for preventing excessive distortion of said cushioning members, and means for limiting the vertical movement of said movable portion.

3. A cushion type socket comprising an apertured bi-part stationary portion, a bi-part movable portion having a recessed plug section and cup shaped section positioned within said stationary portion, and terminal means between said stationary portion and said movable portion comprising intermeshed helical contact members arranged vertically in said plug section and cup-shaped section, said members having large diameter helical springs located between the peripheries of said movable and stationary portions and radially spacing said movable portion with respect to said stationary portion, the longitudinal axis of each of said springs extending radially from said movable portion.

4. A holder for an electrical device comprising an apertured stationary portion having a plurality of radially extending recesses therein, a movable portion having recesses contiguous with the recesses in said stationary portion and a plurality of spaced apertures therein at right angles to said recesses, helical contact members enclosed in said movable portion in alignment with said apertures, and helical spring members integral with said contact member disposed in said recesses in said stationary and movable portions with their longitudinal axes extending radially between said portions for resiliently supporting said movable portion.

5. A holder for an electrical device, comprising an apertured stationary portion, a bi-part movable portion within said stationary portion including a cup-shaped member having recesses in the base thereof and a plug member having a plurality of spaced apertures therein for receiving prongs on the base of the electrical device, said plug member having also a plurality of cut-out portions in alignment with said apertures and with the recesses in said cup-shaped member, linear intermeshed helical contact members disposed in said cut-out portions and said recesses, said stationary portion and said cup-member being provided with juxtaposed recesses in longitudinal walls thereof, and radially extending helical springs integral with said helical contacts positioned in said juxtaposed recesses.

6. A cushion type mounting for electrical devices comprising a hollow stationary support, a member within said stationary support, contacts within said member and tube shaped metallic means integral with said contacts wholly disposed intermediate longitudinal portions of said support and said member with the longitudinal axes of said means extending radially therebetween, said means being universally resilient, but sufficiently rigid to prevent by their resistance to compression contact between said member and said support by external shocks.

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