

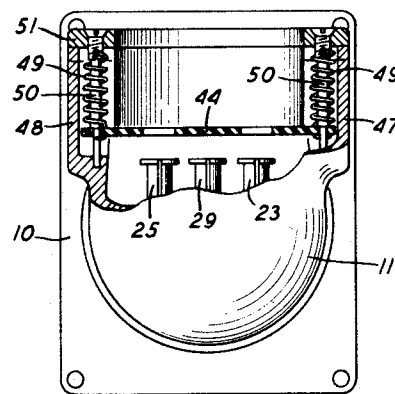
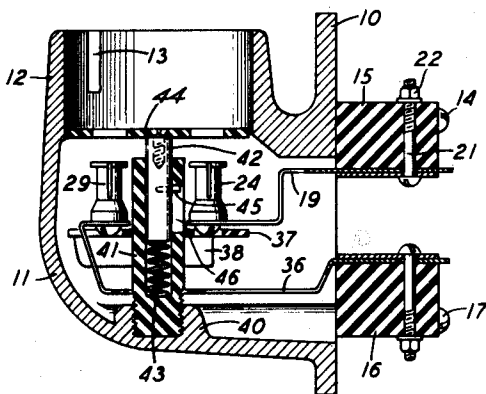
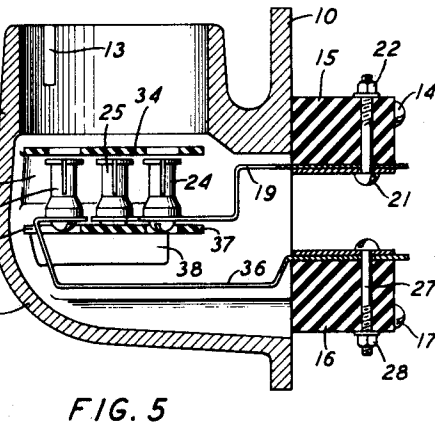
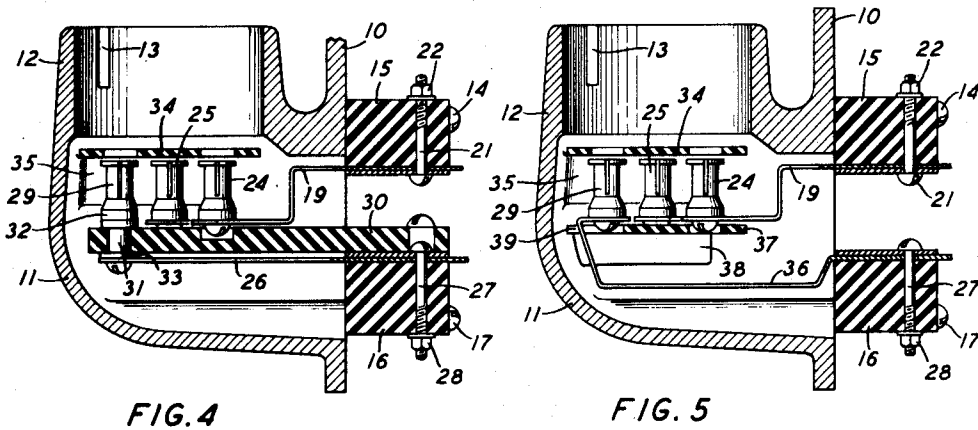
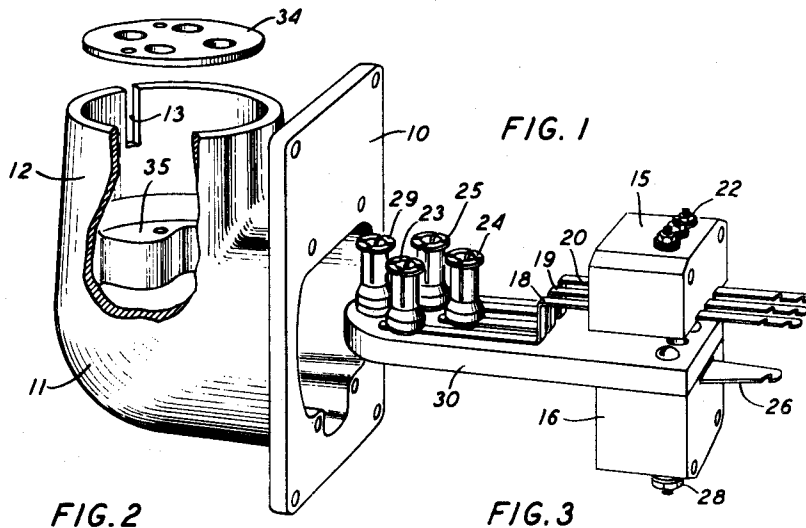
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MOUNTING FOR ELECTRICAL DEVICES

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MOUNTING FOR ELECTRICAL DEVICES

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This invention relates to mountings for electrical devices and more particularly to such mountings for electron discharge devices.

An object of the invention is to overcome excessive heating of the terminal prongs of an electrical device inserted in the mounting, thereby eliminating decomposition of the insulating material of the base in which the terminal prongs of the device are embedded.

In accordance with this invention the mounting comprises a holder or support adapted to be attached to a panel or base of an amplifier system in which the device may be supported in an upright position. The holder is provided with insulating blocks at the rear of the panel and these blocks support terminal springs which project into the cavity in the holder. Each terminal spring carries a split sleeve or cup socket adapted to receive the terminal prongs of the device which is to be supported in the holder.

When a high power device of the electron discharge type is mounted in the holder it is desirable to segregate the high potential anode contact from the other low potential contacts. In order to accomplish this purpose an insulating plate or shield member extends across the cavity in the holder between these contacts and is provided with an aperture through which the anode contact extends. A second insulating plate having apertures corresponding to the terminal prongs on the discharge device is fastened within the cavity of the holder and extends across the ends of the contacts to insure the correct insertion of the device in the holder. The split sleeve contacts insure a large surface engagement with the terminal prongs of the device so that excessive heating does not occur. Therefore, no charring effect will be produced in the insulating base in which the terminal prongs are embedded. Furthermore, the sleeve contacts compensate for any misalignment of the terminal prongs on the base of the device, due to the split sleeve construction of the contacts.

A feature of the invention relates to the removal of the device from the mounting without distorting the sleeve contacts and terminal springs.

In accordance with this feature of the invention, the insulating shield member between the contact springs and the guiding disc above the sleeve contacts form limiting members for the vertical or axial movement of the contacts. In this arrangement, the shield insulating plate limits the downward movement of the contacts and springs when a device is inserted in the mounting and the apertured disc or guiding member limits the upward movement when the device is removed from the mounting. This feature of the invention eliminates distortion of the springs and contacts and insures coaxial align-

ment of the contacts with the apertures in the guiding disc so that the mounting will operate efficiently over an extended period without replacement.

Another feature of the invention relates to a floating support in the mounting in order to prevent shocks or vibrations being transmitted to the device held in the mounting.

In accordance with this feature of the invention, the guiding disc is supported by a central telescopic mounting, to allow a limited vertical movement without rotative movement, or the disc is suspended in the mounting by springs in a peripheral portion of the mounting. This arrangement insures correct insertion of the device in the mounting to engage the contacts on the springs and also supports the device so that shocks or vibrations will not be transmitted to the electrodes of the discharge device supported in the mounting.

These and other features of the invention will be more clearly understood from the following detailed description in connection with the accompanying drawing.

Fig. 1 is a partially exploded view in perspective showing the various units which comprise the mounting made in accordance with this invention;

Fig. 2 shows in cross-section the relationship and assembly of the parts of the device shown in Fig. 1;

Fig. 3 illustrates in cross-section a modified form of the invention in which parallel limiting members are supported wholly within the cavity of the mounting;

Fig. 4 shows in cross-section another modification of the invention in which one of the limiting members is centrally and resiliently supported within the cavity of the mounting; and

Fig. 5 is a front view partly in section of another modification of the invention in which the perforated limiting member is resiliently supported at the periphery thereof.

Referring to Figs. 1 and 2 the mounting, in accordance with this invention, comprises a metallic holder or support having an apertured base portion 10 adapted to be attached to a panel. Integral with the base portion is an elbow portion 11 terminating in a cylindrical shell portion 12 which is adapted to receive the base of an electrical device, such as an electron discharge device. A bayonet slot 13 is provided in the shell to receive the locking pin of the electrical device. To the rear wall of the base portion is attached by screws 14, a block 15, of insulating material, which slightly overlies the aperture in the base portion 10. A second block 16, of insulating material, is also attached to the base portion by screw 17 and arranged on the opposite side of the aperture in the base portion 10. These blocks insulatingly

support a plurality of contact springs from the metallic mounting which forms a hollow cavity leading to the aperture in the base portion 10. Three contact springs 18, 19 and 20 are located in grooves in the lower surface of the block 15 and are held in position by bolts and nuts 21 and 22. The inner ends of these springs project into the cavity formed in the mounting and are provided with tubular split metallic contacts 23, 24 and 25, respectively. A single flat spring member 26 is attached to the upper surface of insulating block 16 by a bolt and nut 27 and 28. This spring member is of greater width and length than the other contact springs and extends parallel to and beyond the middle contact spring member 19. A tubular split sleeve contact 29 is mounted in the insulating block 30 and is connected to the spring member 26 and is arranged in the same plane as the contacts 23, 24 and 25. The tubular contacts provide large surface engagement with the terminal prongs of the electrical device to be inserted in the mounting and also serve as gripping members to positively support the device in the mounting.

When a high power electron discharge device is inserted in the mounting the low potential terminal prongs engage the tubular contacts 23, 24 and 25 and the high potential terminal prong engages the tubular contact 29. In order to protect the low potential contacts from the high potential contact and its associated parallel resilient spring member, a shielding member 30 is interposed between the resilient spring members 18, 19, and 20 and the high potential spring member 26. This shield member 30 segregates the high potential spring member from the low potential spring members and consists of an insulating plate rigidly attached to the insulating block 16 and projecting into the cavity between the spring members. The shield member is provided with an aperture through which a sleeve member 31 projects and connects the tubular sleeve contact 29 to the spring member 26. The shoulder 32 of the tubular contact 29 rests on the upper surface of the shield member 30 and a washer 33 engages the lower surface of the shield member 30 adjacent the sleeve 31 to rigidly fasten the tubular contact 29 in position with respect to the other tubular contacts. The unit assembly of the various elements entering into the construction of the mounting of this invention provides easy access to the various parts of the mounting and facilitates replacement of defective parts, thereby eliminating the high cost of replacing the entire mounting.

A perforated insulating disc 34 is supported in the cavity surrounded by the cylindrical portion 12 by internal projections 35, one of which is shown in Fig. 1. When the insulating disc 34 is attached to the projection 35 the disc is spaced slightly above the free edges of the tubular contacts and the apertures are in register with the openings in the tubular contacts to form a guiding member for the terminal prongs extending from the base of the electrical device to be inserted in the mounting. When the terminal prongs enter the apertures in the disc 34 they engage the tubular split contacts directly below the apertures, and since the contacts are yieldable due to the split tubular construction, it is necessary to exert pressure on the device in order to expand the split contacts to receive the terminal prongs. The forcing of the terminal prongs into the split contacts insures positive engagement between the terminal prongs and the contacts. The large

surface engagement substantially decreases contact resistance between the terminal prongs and the contacts, thereby eliminating corrosion.

The apertured guiding disc 34 and the insulating shield 30 are positioned on opposite ends of the tubular contacts and serve as limiting means for the tubular contacts when a device is inserted in or withdrawn from the mounting. The shield member 30 limits the downward movement of the contacts when the terminal prongs engage the contacts and forms a rigid member to prevent distortion of the tubular contacts and the resilient springs attached thereto. Similarly, when the device is removed from the mounting the guiding disc 34 serves as a limiting member for the tubular contacts in the opposite direction so that the device may be removed from the mounting without distorting the tubular contacts. Another advantage of the split tubular contacts is that any irregularity in the spacing of the terminal prongs on the base of the device is compensated for by the expansible tubular contacts which are arranged to take up any irregularity in the spacing of the contacts and any difference in the diameter of the terminal prongs.

The mounting shown in Fig. 3 is substantially the same as that described in connection with Fig. 2 except that the insulating shield is supported wholly within the cavity of the mounting and the high potential resilient spring is widely spaced from the low potential resilient springs. In this arrangement a relatively long terminal spring 36 extends into the cavity from the insulating block 16 and is bent upwardly and rearwardly in the same plane as the edges of the terminal springs 18, 19 and 20 and is attached to the tubular contact 29. An insulating plate 37 lies parallel to the guiding disc 34 on the opposite side of the tubular contacts and is attached to projections 38 on the inner wall of the mounting. This plate is provided with apertures or recesses to receive the projections on the lower surface of the contact springs 18, 19 and 20 and is also provided with a cut-out portion 39 through which the bent extension of the spring 36 may freely pass. The parallel insulating plate and disc serve the same purpose as the disc 34 and insulating plate 30 shown in Fig. 2, that is, the function of limiting the axial movement of the tubular contacts which are located between the insulating plates.

Fig. 4 shows another modification of the invention in which the device supported in the mounting is maintained in a floating position to overcome shock and vibration. In this arrangement, which is quite similar to the assembly shown in Fig. 3, a projection 40 is formed on the inner surface of the elbow portion 11 along the axis of the cylindrical shell portion 12. A tubular insulating column or standard 41 is threaded into the projection 40 and extends centrally through apertures in the resilient spring 36 and the insulating plate 37. A slidable rod 42 is positioned in the tubular insulating standard and engages an expanded helical spring 43. An apertured guiding disc 44 is attached to the rod 42 and extends across the cavity within the cylindrical portion 12 of the mounting. A pin 45 rigidly attached to the rod 42 intermediate its ends is movable in a vertical direction in a slot 46 in the side of the tubular standard 41. The pin 45 and slot 46 permit a limited movement of the rod 42 carrying the apertured insulating plate 44 and prevent rotative movement thereof within the mounting.

In this arrangement a device entering the mounting forces the apertured insulating plate

44 toward the tubular contacts until the terminal prongs are in engagement with the tubular contacts and when pressure is relieved the apertured insulating plate 44 moves out of engagement with the tubular contacts and the device is supported in a full floating condition by the insulating plate 44 and the tubular contacts. This arrangement prevents shocks and vibrations affecting the electrodes in the device supported in the mounting and the parallel insulating plates serve as limiting means for the movement of the tubular contacts located therebetween. Furthermore, the axial position of the tubular standard within the mounting forms an insulating barrier between the high potential tubular contact 29 and the low potential tubular contact 24, being respectively the contacts which connect the anode and grid to an external circuit. Therefore, the insulating barrier increases the insulation resistance between these terminal members.

Fig. 5 shows another modification of the full floating type mounting in which the apertured insulating disc 44 is resiliently supported on the periphery thereof instead of centrally supported as shown in Fig. 4. In this arrangement the cylindrical shell 12 of the mounting is provided with parallel embossments 47 and 48 which provide chambers for resilient helical springs 49. These springs are connected to guiding rods 50 threaded into an annular ring 51 attached to the edge of the cylindrical portion 12 of the mounting which are seated in holes at the bottom of the chambers formed by the embossments 47 and 48 on the mounting. The apertured insulating plate 44 slides freely on the rods 50 and is attached to one end of the springs 49 which are rigidly attached at their other ends to the guiding rods 50. The apertured insulating disc 44 guides the terminal prongs of the device into the tubular contacts within the cavity of the mounting and when the device is supported therein serves as a yielding support to maintain the device in a floating condition and to protect it from shock or vibration transmitted to the mounting in an axial direction.

While the invention has been disclosed in a number of embodiments to set forth the various features of the invention, it is, of course, understood that various modifications may be made in the details and assembly of the structures disclosed without departing from the scope of the invention as defined in the appended claims.

What is claimed is:

1. A mounting comprising a support having a base portion and a tubular cavity adapted to receive an electrical device, a disc having perforations positioned in said cavity, tubular contacts arranged on one side of said disc in alignment with said perforations, resilient terminal members extending from said contacts to said base portion, one of said members being in a plane displaced from a plane common to the other of said members and an insulating shield extending between said one member and the other of said members and positioned adjacent said other members.

2. A mounting comprising a support having a base portion and a tubular cavity adapted to receive an electrical device, a plurality of spaced leaf springs attached to said base portion at different levels and extending into said cavity, tubular contacts attached to said springs within said cavity, and an insulating plate positioned in said

cavity intermediate said springs to limit the movement of said contacts.

3. A mounting comprising a support having a base portion and a tubular cavity adapted to receive an electrical device, a plurality of spaced leaf springs attached to said base portion and extending into said cavity, tubular contacts attached to said springs within said cavity, and spaced parallel insulating members within said cavity positioned immediately adjacent, but out of contact with opposite ends of said contacts, one of said members having perforations in alignment with said contacts adapted to receive the prongs of the electrical device, and the other of said members segregating one of said springs from the others.

4. A mounting comprising a support having a base portion and a tubular cavity adapted to receive a discharge device, a block of insulating material attached to said base portion, a plurality of spaced leaf springs attached to said block and extending into said cavity, tubular contacts attached to said springs within said cavity, and an insulating plate extending into said cavity from said base, segregating one of said springs from the others and positioned adjacent one end of said contacts to limit the movement thereof.

5. A mounting comprising a metallic support having a base portion and a tubular cavity adapted to receive a discharge device, an insulating member attached to said base and extending into said cavity, a tubular contact mounted on said member and disposed within said cavity, a block of insulating material attached to said base, a plurality of tubular contacts adjacent said first contact, and means supporting said second contacts from said block and positioning said second contacts with their ends in the same plane as said first contact.

6. A mounting comprising a metallic support having a base portion and a tubular cavity adapted to receive a discharge device, an insulating member attached to said base portion and having a portion extending into said cavity, a tubular contact mounted on said extending portion and disposed within said cavity, a block of insulating material attached to said base portion, a plurality of tubular contacts within said cavity, and bent resilient springs carried by said block and positioning said last mentioned contacts with their ends in the same plane as said first mentioned contact.

7. A mounting comprising a metallic support having a base portion and a tubular cavity adapted to receive an electrical device, insulating blocks attached to said base portion, contact springs carried by said blocks and projecting into said cavity, tubular contacts rigidly attached to said springs and positioned in said cavity with their ends in the same plane, an insulating shield segregating one of said contact springs from the others, and a perforated insulating insert spaced from the ends of said tubular contacts and arranged parallel to said insulating shield.

8. A mounting comprising a support having a base portion and a tubular cavity adapted to receive a discharge device, contact springs carried by said base portion projecting into said cavity, a guiding member above said springs, and means engaging the periphery of said guiding member for resiliently supporting said member adjacent said contact springs and spaced therefrom.

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