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ELECTRICAL COMPONENT RETAINING AND SHIELDING MEANS

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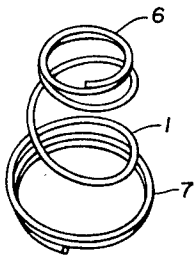


FIG. 1

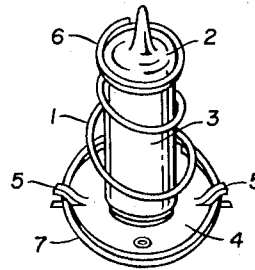


FIG. 2

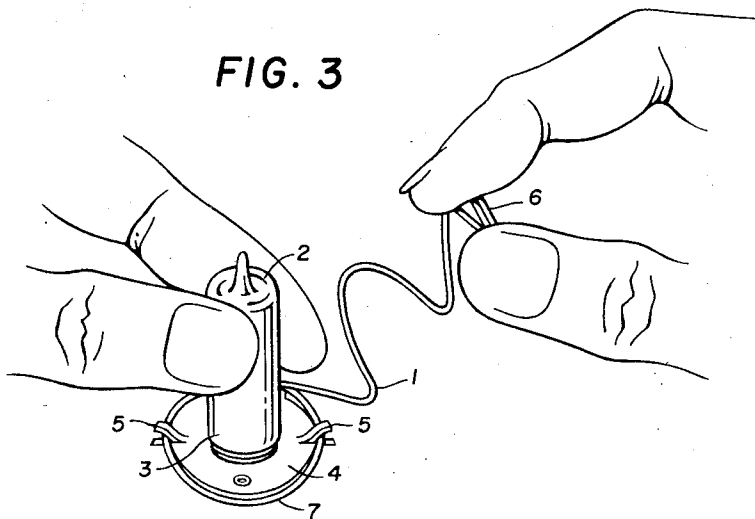


FIG. 3

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ELECTRICAL COMPONENT RETAINING
AND SHIELDING MEANSRudolph G. Miller and Allan Holstrom, Roches-
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5 Claims. (Cl. 250—27.5)

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Our invention relates to improvements in electrical component retaining and shielding means, and more particularly to clamping devices for preventing the disengagement from their sockets of electron discharge devices or other devices.

It is well known that certain commercial forms of vacuum tubes, ballast tubes, vibrators and the like are normally held in place by socket-mounted female spring clips which grasp their male-contact base pins, and that these devices are liable in ordinary use to become disengaged from their sockets. This is particularly true of relatively heavy devices such as the larger receiving-type tubes or battery vibrators, or of devices having contact pins of small diameter, such as vacuum tubes of the type designated in trade usage as miniature, or of devices subjected to vibration or rough handling. Consequently, in cases of this nature, auxiliary clamps have been installed over these devices to secure them in place. Prior to our invention, these clamps have been either relatively bulky, inconvenient, or expensive, or had more than one of these objections.

It is accordingly an object of our invention to provide a means of maintaining in position a socket-mounted electrical component, such as a vacuum tube or the like, which may be made much more cheaply than other types but which retain the component in its socket with the requisite firmness.

It is a further object of our invention to provide a device which will retain in its socket an electrical component, and which may readily be held aside while the component is removed from its socket and another component inserted, after which the device may readily be re-installed in retaining position.

It is a further object of our invention to make a cheap and efficient electrical-component retaining means which provides a degree of electrostatic shielding adequate for certain tubes.

It is still another object of our invention to provide a device for retaining an electrical component in its socket which will optionally accommodate components of different heights without adjustment.

Further objects and advantages of our invention will become apparent as the following description proceeds and the features of novelty which characterize our invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of our invention reference may be had to the accompanying drawing, of which Figure 1 is a three-quarter view

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of a preferred embodiment of our invention; Figure 2 shows a tube secured in its socket by this embodiment; and Figure 3 is a view showing how this embodiment may be manipulated to remove a vacuum tube from its socket.

The preferred embodiment of our invention is particularly adapted for use with miniature vacuum and gaseous discharge tubes. As shown in the drawing, it comprises resilient means such as a spring 1 formed in the shape of a conical helix adapted to receive at its upper end the upper outer surface 2 of an electrical component, such as a miniature-type vacuum tube 3, and adapted at its lower end to be secured to the socket-mounting surface 4, usually termed a chassis, by two ears 5 or tabs formed by bending up parts of the chassis material. It should be noted here that any number of ears may be used, or that any other suitable means for fastening the large-diameter end of the spring to the socket-mounting surface may be used without departing from the spirit of our invention. The last few turns on each end of the spring are close-wound and are formed into planes perpendicular to the axis of the spring, as indicated by the numerals 6 and 7. The spring 1 may be formed of any material which will produce a spring having sufficient stiffness to bias or hold the shortest component it is desired to accommodate in engagement with its support or socket.

To insert the tube in its socket, the upper close-wound turns of the spring may be grasped between the thumb and index finger of one hand and held aside, as shown in Figure 3. The tube may then be inserted in its socket through the wide loop between adjacent convolutions of the spring, after which the spring may be stretched upwards and over the top of the tube. Releasing the spring allows it to draw down snugly on the tube in nested relationship and to secure the tube in place, the spring being stretched between the upper outer surface of the tube 3 and the ear 5. The pitch of the spring is chosen to facilitate ready insertion and removal of the tube. It is apparent that the manufacture of this embodiment of our invention requires only a small amount of wire, and involves only a simple winding operation.

We have found that the electrostatic shielding afforded by the two close-wound top turns of the spring is more than adequate for certain types of tubes (such as the type known commercially as the 6AT6) when employed in certain circuits, such as audio amplifier circuits. If necessary, of course, a number of turns sufficient to provide the

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desired shielding may be provided, i. e., one or more.

While we have shown and described a specific embodiment of our invention, other modifications will readily occur to those skilled in the art. We do not, therefore, desire our invention to be limited to the specific arrangement shown and described, and we intend in the appended claims to cover all modifications within the spirit and scope of our invention.

We claim:

1. In combination with an electrical component and means for supporting said component, means for maintaining said component in position with respect to said supporting means, said maintaining means comprising a spring engaging a portion of said component and a portion of said supporting means, said spring being arranged to bias said component toward said portion, said spring having enough turns to provide electrostatic shielding for said component.

2. In combination with an electrical component and supporting means therefor, means for maintaining said component in position with respect to said supporting means, said maintaining means comprising a helical spring having a plurality of loops and being adapted to engage a portion of said component and a portion of said supporting means, said spring being arranged to bias said component toward said portion, and to permit said component to be removed from its position with respect to said supporting means by distorting said spring and passing said component between the convolutions of said spring.

3. In combination with an electrical component and supporting means therefor, a retaining device for preventing the unintentional disengagement of said component from said supporting means, said retaining device comprising a spring having a smaller diameter at its upper end adapted to seat against the upper outer surface of said component and having a diameter throughout its lower portion at least large enough to fit over said component in nested relationship, said spring being adapted to be stretched between said upper outer surface and said supporting means and having at least one turn at each end formed in a plane substantially perpendicular to the axis of said spring and having sufficient stiffness to maintain said component firmly engaged with said supporting means and arranged to accommodate optionally and without adjustment components of different heights.

4. In combination with an electrical component and supporting means therefor, a retaining

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device for preventing the unintentional disengagement of said component from said supporting means, said retaining device comprising a spring having a smaller diameter at its upper end adapted to seat against the upper outer surface of said component and having a diameter throughout its lower portion at least large enough to fit over said component in nested relationship, said spring being adapted to be stretched between said upper outer surface and said supporting means and having sufficient stiffness to maintain said component firmly engaged with said supporting means and having a plurality of close-wound turns at each end formed in planes substantially perpendicular to the axis of said spring, said spring constituting an electrostatic shielding for said component.

5. In combination with an electrical component and supporting means therefor, a retaining device for preventing the unintentional disengagement of said component from said supporting means, said retaining device comprising a spring having a smaller diameter at its upper end adapted to seat against the upper outer surface of said component and having a diameter throughout its lower portion at least large enough to fit over said component in nested relationship, said spring being adapted to be stretched between said upper outer surface and said supporting means and having sufficient stiffness to maintain said component firmly engaged with said supporting means and having a plurality of close-wound turns at each end formed in planes substantially perpendicular to the axis of said spring, and said spring being wound with a pitch which will allow the finished and mounted spring to be raised and held aside while said component is engaged with or disengaged from said supporting means by inserting or withdrawing said component between the convolutions of said spring.

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