

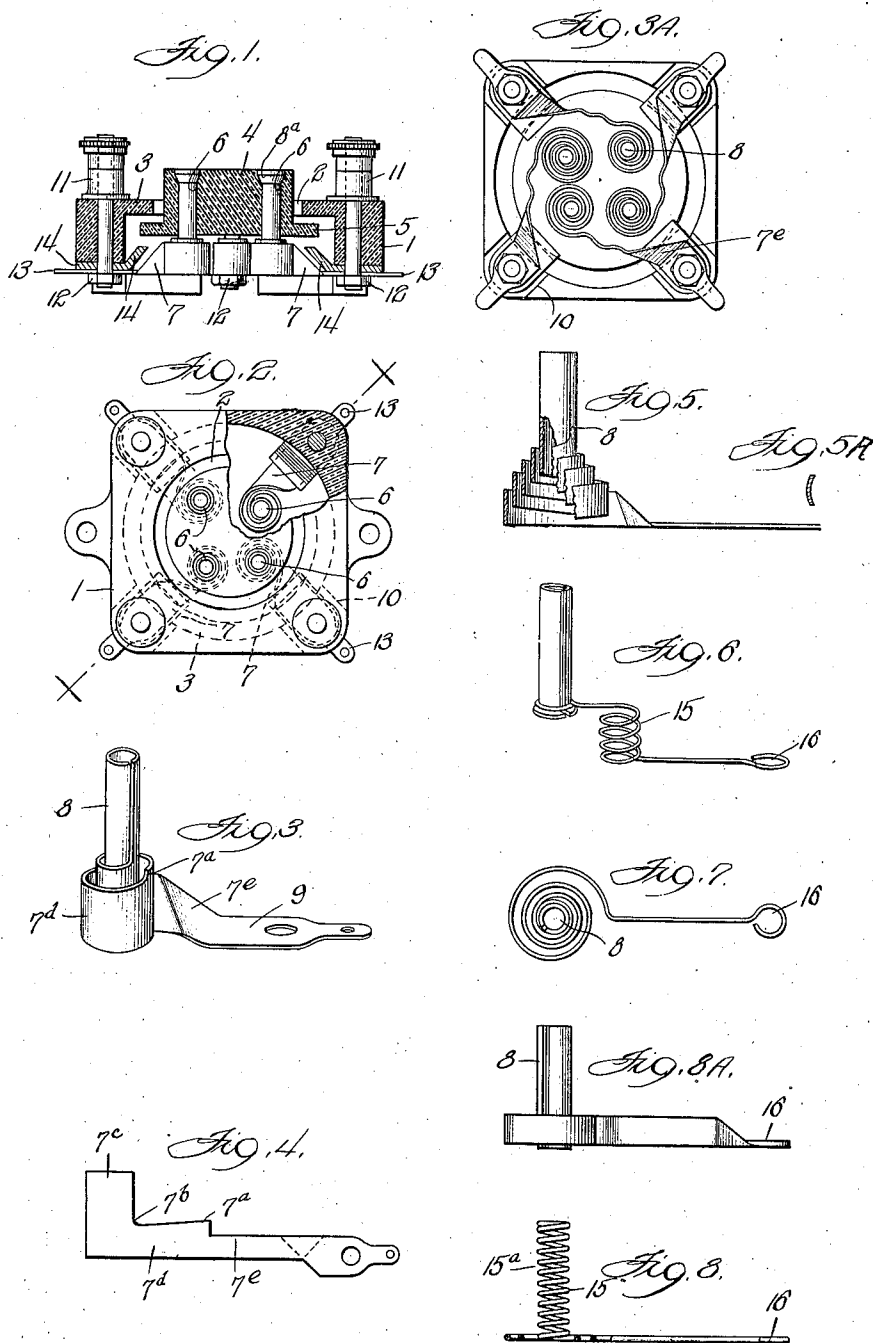
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SHOCK ABSORBING MOUNT OR SUPPORT

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SHOCK ABSORBING MOUNT OR SUPPORT

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My invention relates to shock-absorbing mounts or supports for thermionic valves and other delicate electrical devices, liable to be effected by shocks or vibrations, and relates particularly to improved spring supports for the valves or other electrical devices, or for the supports therefor.

According to the present invention the shock-absorbing supports, are constituted by springs, formed from spring strip metal or wire, such as brass, so bent or arranged as to provide for resilient action in both vertical and horizontal directions and in a rotary sense or in a combination of these directions.

One end of the spring is formed as or provided with a vertical socket or supporting member while the other end is horizontal or extends out horizontally, the intermediate portion being coiled in a spiral or helix, the spring support constituting at the same time, an electric conductor.

In the preferred form, as a shock-absorbing support for a thermionic valve, we form the springs, preferably four, from spring strip brass, each of which is so bent and coiled at one end as to form a vertical tube or socket to receive a leg of the valve, the other end extending out horizontally, the intermediate part being coiled around the lower end of the vertical tubular part, or being of greater diameter than the upper part. By this construction a spring support is formed which will have a shock-absorbing effect in vertical, horizontal and rotary directions, or any combination of these directions.

The invention is illustrated, by way of example, in the accompanying drawings, as applied to or constructed for a thermionic valve mount or holder.

Figure 1 represents a vertical section on the line 1—1 of Fig. 2;

Fig. 2 is a plan view with one corner of the mount partly broken away;

Fig. 3 shows an elevation of one of the springs on an enlarged scale;

Fig. 3a shows in plan view, a modification thereof;

Fig. 4 shows on a smaller scale, the spring (Fig. 3) in development, or laid out flat; and

Figs. 5, 5a, 6, 7, 8 and 8a show modifications.

Referring first to Figs. 1 to 4, the construction shown comprises a base 1 of bakelite or other insulating material having a central opening 2, the base being recessed on its underside thereby forming a circular flange 3 around the opening 2, and a disc or holder 4 of insulating material having a flange 5 around its lower edge arranged within the opening 2 and provided with holes 6 to receive the legs of a thermionic valve (not shown).

This holder 4 is supported from the base 1 by means of four springs 7, the construction of which will be described hereafter. The inner end of each spring is constituted by a tubular part 8, which extends up vertically and fits in one of the holes 6 in the holder 4, its end being preferably flanged outwardly, as shown at 8a. The other end 9 of the spring extends out horizontally and, in the example illustrated, its end lies in a slot 10 formed on the underside of the base, these slots being shown as provided at the corners of the base 1. Each spring 7 is provided with a hole to allow the passage of a securing screw or a screw-threaded extension of a terminal 11, which is secured in place by a nut 12. Each spring is preferably provided at its outer end with a projection 13, in those cases where a soldered connection is required.

It will be noted that the holder 4 is freely supported in the opening 2 by the springs 7, its flange 5 lying between the flange 3 and stops 14, which can conveniently be arranged between the outer end of the springs 7 and the underside of the base 1, as shown in Figure 1. Thus the extent of vertical movement of the holder 4 will be limited in both directions and undue strain upon the springs will be thereby prevented, which might otherwise take place in the application or removal of the valve.

The combined vertical and horizontal spring, which forms the essential feature of the present invention, will now be described more in detail.

Referring to Fig. 4, it will be seen that the spring illustrated is formed from a strip of spring sheet metal of peculiar shape, one edge

of the strip being stepped at 7a and 7b forming sections 7c, 7d and 7e. The highest section of the spring 7e is coiled to form a split tube 8 (Fig. 3), the upper end of which is inserted in the hole 6 in the holder 4, as shown in Figure 1, thereby constituting a metallic spring socket to receive a pin of the valve.

The next section of the spring 7d is of less height and preferably tapers slightly from 7a to 7b, and is coiled once or more around the tubular part 8 while the outer section is twisted and bent down, as at 7e, so that the part 9 extends out horizontally. When fitted in the holder 4 the projecting part 7e will lie just below the underside of the holder 4 and even if the tubular part is pushed up to such an extent that the part 7a comes in contact with the underside of the holder the resiliency of the tubular part 8 will not be unduly affected, since the coiled portion 8a will still lie below and out of contact with the under surface of the holder. Of course, a similar effect could be obtained by providing a slight lug or upward projection at the point 7a (Fig. 4).

In the modification shown in Fig. 3a the horizontal portion of the spring is shown as corrugated, its outer end being twisted at 7e so as to be at right angle to the corrugated portion.

The object of employing a spring of this kind is to provide for the necessary resiliency in action in all directions, not only in a vertical direction, as such a spring can take up not only vertical stresses but also those in a horizontal direction, and rotary direction, or in a combination of these directions.

A slightly modified form of spring, made of strip spring metal, is shown in Fig. 5 wherein one end of the strip is bent to form a central socket 8, the strip being then wound in a conical helix and the outer end bent outwards and twisted, as in Figure 3.

This strip may be flat, or as shown in section in Fig. 5a, it may be of curved cross-section.

While the strip metal construction described has been found to give most excellent results, a spring of similar shape and characteristics can be made from spirally wound wire, some such constructions being illustrated in Figures 6, 7 and 8a.

In the construction shown in Fig. 6 the spring has a middle coiled vertical portion 15 and horizontal end portions, one end being coiled to form a socket, or attached to a socket, as shown, and the other end being formed into a ring for securing the spring in place, and to a terminal or like connection.

Figs. 7 and 8 show a spring wire bent into a flat spiral its inner end being connected to a vertical socket 8 (Fig. 7), or bent into a cylindrical socket 8 (Fig. 8), while its outer end is formed into a loop or ring 16.

The construction shown in Fig. 8a is simi-

lar to that shown in Fig. 5, the spring however, being in the form of a flat spiral instead of a conical helix.

In all cases the spring its intended to act as an electric conductor in addition to its function as a shock absorbing support, and in all cases the construction is such as to allow movement to the holder, valve or other device supported by the springs in vertical, horizontal and rotary directions, or in a combination of these directions.

It is to be understood that while, for the sake of example, the invention has been illustrated and, principally, described as applied to a valve holder, its use is not restricted to that, and its ends will therefore be shaped or provided for the particular purpose or device in connection with which it is to be used.

I claim:

1. A cushion socket for vacuum tubes comprising a plurality of contacts for engaging the tube terminals, an insulating tube supporting member to which said contacts are secured, and means for yieldingly supporting said tube supporting member and affording electrical connections for said contacts, comprising a plurality of sheet metal members, one for each contact, each sheet metal member comprising a flat portion lying substantially in a plane transverse to the axis of the tube, to be secured to a support and a ribbon-like strip wound into a spiral spring formed integrally with said flat securing portion and electrically connected with a contact.

2. A cushion socket for vacuum tubes comprising a plurality of integral members formed of sheet metal, each comprising a tube terminal engaging contact portion and a tube supporting spring portion, and an insulating tube supporting member to which said contacts are secured, supported by said spring members, each contact comprising a tubular portion for receiving a terminal and each contact comprising a ribbon-like spiral spring portion substantially coaxial with said tubular portion, said tubular portion and spiral portion being integral and formed of a single strip of sheet material.

3. A cushion socket for vacuum tubes comprising a plurality of integral members formed of sheet metal, each integral member comprising a tube terminal engaging contact portion, a spiral spring portion, and a flat spring securing portion, said spiral portion being intermediate of said flat spring portion and said contact portion, said contact portion comprising a tubular member for receiving a terminal and said spiral spring portion comprising a ribbon-like spiral wound up from said flat material, said flat spring securing portion lying substantially in a plane transverse to the axis of the tube and an insulating tube supporting member to which said contacts are secured and which is supported by said spring portions.

4. A support for a vacuum tube or the like comprising, in combination, a tube carrying member, and a plurality of springs adapted to yieldingly support said member, 5 each of said springs embodying therein a helical portion fast to said member and adapted to encircle a terminal of a vacuum tube and constituting an electric circuit connection thereto, each of said springs also embodying therein a loop for receiving a fastening member. 10

5. A shock absorbing socket comprising a base, an insulating tube holder having perforations for the prongs of a tube, a series of 15 spring conducting members each comprising a spring arm having its outer end riveted to the base beyond the circumference of the tube holder, a helical spring portion supported by the free inner end of said arm out of contact 20 with the base, the said holder being secured to and supported by the upper ends of said helical spring portions in their proper positions to receive the tube prongs.

In testimony whereof I affix my signature.

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