

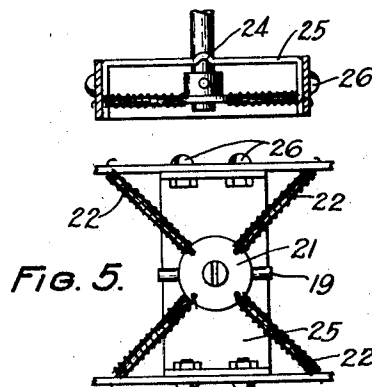
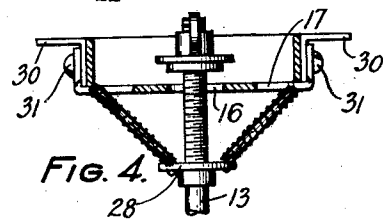
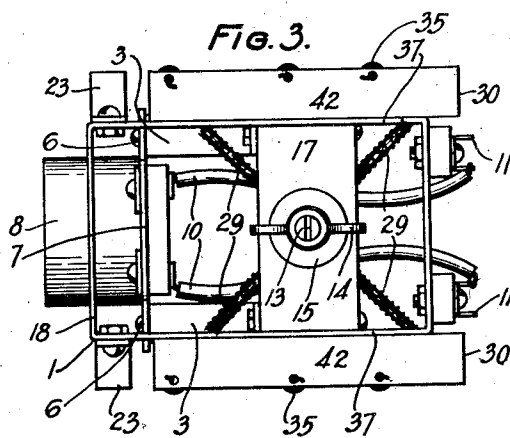
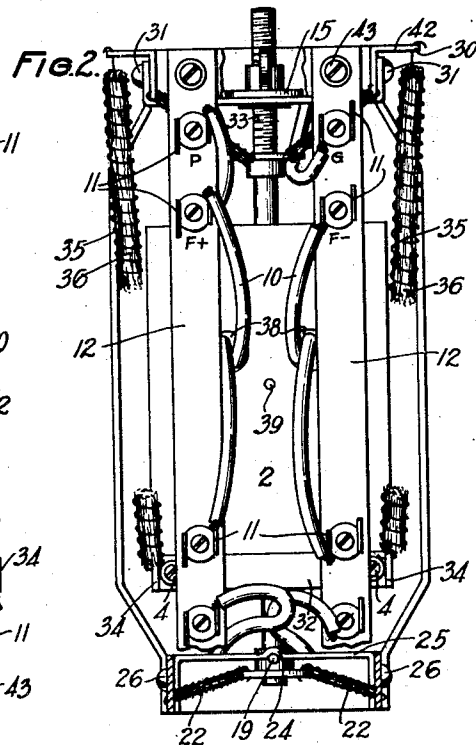
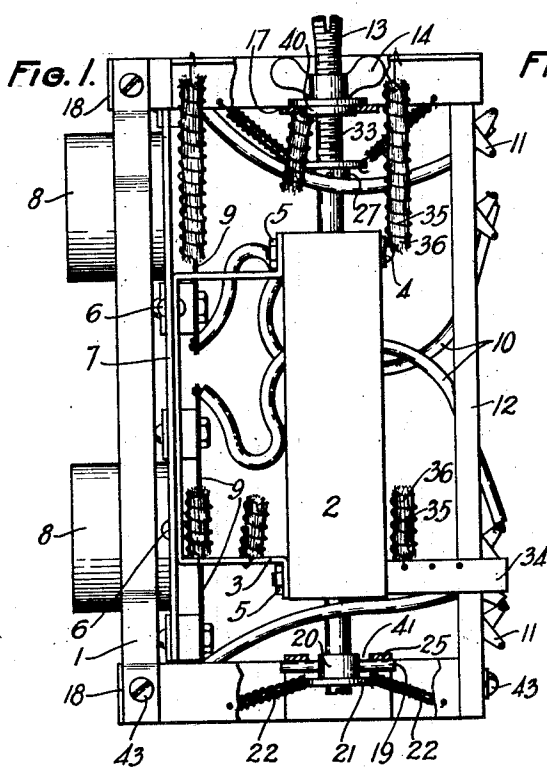
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MOUNTING FOR VACUUM TUBES

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MOUNTING FOR VACUUM TUBES

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This invention relates to a mounting for vacuum tubes or similar devices and more particularly to a resiliently supported shock-proof mounting for such devices.

5 The general object of this invention is to resiliently support a vacuum tube and socket in an improved manner.

A further object of the invention, is to effectively lock the resilient support to a 10 frame when it is being shipped or otherwise handled.

In accordance with this invention, there is provided a suitable supporting frame embracing a vacuum tube socket which is secured to 15 an inertia mass resiliently suspended from the supporting frame by damped helical springs and is prevented from rotating by radially disposed springs located at the ends of the frame. The inertia mass is provided 20 with a locking device which is capable of rigidly attaching the inertia mass to the mounting frame when the mounting is to be shipped or subjected to handling. In one embodiment of the invention, this locking 25 device comprises a rod secured to the inertia mass which carries a cross-pin at one end to engage a detent in a plate forming part of the supporting frame, and at the other end, projects through a plate and provided with a 30 locking member which secures the mounting to the frame. When it is desired to protect the mounting in transit the locking member is tightened to raise the rod and inertia mass connected thereto until the cross-pin engages 35 the detent plate whereupon the tube mounting is held rigid. When the locking arrangement is released the suspension spring and inertia member amply protect the vacuum tube held in the socket from shock and 40 external vibration.

A more complete understanding of this invention will be obtained by referring to the attached drawings, wherein:

45 Fig. 1 shows a partially broken side elevation of a vacuum tube mounting rigidly secured within a frame ready for transportation or other handling;

50 Fig. 2 is a partially broken rear elevation of the same mounting showing more clearly the suspension means therefor and the nature

of the locking device employed to maintain it rigidly secured when being transported or handled;

Fig. 3 is a plan view of the mounting shown in Fig. 1 and illustrates the arrangement of 55 the upper centering springs;

Fig. 4 illustrates the positions assumed by the upper and lower centering springs of the vacuum tube mounting when it is freely suspended within the frame; and 60

Fig. 5 shows the arrangement of the lower centering springs.

Referring now to the various figures, there is shown a frame 1 for a vacuum tube mounting. This frame consists of two rectangular 65 shaped members 18 spaced apart by the bowed metallic members 23 and the hard rubber members 12 which are secured to said members 18 by screws 43. Within the frame is a block 2 of a material of high density, 70 such as lead. To this block, better termed an inertia mass, is fastened by means of bolts 4, which project through the corner portions of said block, and nuts 5, the brackets 3. The bolts 4 and nuts 5 at the lower corner portions 75 of the block 2 also act to secure to said block the U shaped member 32 whose vertical legs 34 extend beyond the members 12 and are spaced slightly therefrom. By means of screws 6, base plate 7, for a plurality of 80 vacuum tube sockets 8, is mounted upon said brackets. The contact springs 9 are insulatively secured to the plate 7, as shown, and are connected with the terminals 11 on the hard rubber frame members 12 by flexible 85 rubber-covered conductors 10, some of which, to shorten their lengths and also to prevent their interference with the mounting, are drawn through the openings 38 in the block 2.

Integral with the block 2, or passing 90 through and secured thereto in a suitable manner, for instance, by the pin 39, is a rod 13 whose threaded extremity 33 is engaged by a wing nut 14 secured to a washer 15 having portions of different diameter whose 95 portion 40 of smallest diameter is capable of engaging with a circular aperture 16 in a horizontal cross member 17 secured to opposite sides 37 of the upper rectangular frame member 18. Near the lower extremity of the 100

rod 13, which projects through an aperture 41 in the cross member 25 secured to opposite sides of the lower rectangular frame member 18, a flanged member 20 is sweated thereon and through an opening therein in line with a drilling in the rod 13, a pin 19 is positioned. From the flange 21 of member 20 to the lower frame member 18, extend helical springs 22 enclosing a suitable damping material to prevent sustained mechanical oscillations in said springs. The pin 19 is shown engaged with the detent 24 in member 25 which is secured to the frame member 18 by means of screws 26. A flanged member 27 similar to member 20 is provided at the base of the threaded portion 33 of the member 13. From its flanged portion 28 extend diagonally disposed helical springs enclosing suitable damping material and whose extremities engage with openings in the flange 23 and in the frame member 18. Secured to the sides 37 of the upper frame member 18 by means of screws 31 are angle irons 30. The screws 31 also serve to fasten member 17 to member 18. Each member 30 is provided on its horizontal surface 42 with a number of small drillings in which the looped extremities of spring members are capable of engaging the portions 34 of the member 32 and those portions of the brackets 3 perpendicular to the face of the block 2 are provided with similar drillings. Extending between said members on each side of the vacuum tube mounting are six helical suspension springs 35 enclosing a suitable damping material 36, such as cotton wicking.

Figs. 1 and 2 show the vacuum tube mounting in its locked position ready for transportation or other handling. The wing nut has been tightened down on the threaded end of the rod 13, such that the block 2 and lower portion of the rod have been drawn upward to cause the pin 19 to become engaged with the detent 24 whereby the ordinarily resiliently suspended vacuum tube mounting is rigidly secured against movement within the frame 1. When the mounting is thus locked, the tension in the upper springs 29 and the slightly angularly disposed suspension springs 35 is partially relieved.

To unlock the mounting, the wing nut is loosened until the cross-pin 19 disengages with the detent and the block 2, or inertia mass, is resiliently suspended by means of the damped helical springs 35, which prevent sustained vertical mechanical oscillations of the mounting when subjected to shock, and centered by the upper and lower springs 29 and 22, respectively, which also act to counteract rotative movements of the mounting. The block 2 is of considerable mass so that its inertia will be high and require an appreciable force or shock to cause any initial movement thereof. As illustrated by Fig. 4, when the vacuum tubes oc-

cupy their sockets and are resiliently suspended by their mounting, the lower springs 22 are substantially horizontal.

The spring suspension arrangement has been found particularly efficient in preventing the transmission of vibrations and other extraneous noises to the vacuum tubes carried by the inertia member.

What is claimed is:

1. A shock-proofing mounting for a vacuum tube comprising a supporting frame, a resilient support therein for said vacuum tube, and means for preventing movement of said support, said means comprising a member having at each extremity rigid means for securing the support to said supporting frame.

2. In a shock-proofing mounting for a vacuum tube, a frame, a support for said vacuum tube comprising an inertia member upon which said vacuum tube is mounted, a plurality of springs extending upwardly from said inertia member to said frame and providing resilient suspension for said inertia member, an elongated member secured thereto, and a plurality of springs near each extremity of said elongated member extending between the frame and said elongated member to center said inertia member within said frame.

3. In a shock-proofing mounting for a vacuum tube, a frame, a support for said vacuum tube comprising an inertia member upon which said vacuum tube is mounted, a plurality of springs extending upwardly from said inertia member to said frame and providing resilient suspension for said inertia member, an elongated member secured thereto, and a plurality of springs near each extremity of said elongated member extending between the frame and said elongated member to center said inertia member within said frame, the springs secured to one extremity of said elongated member being positioned in a horizontal plane when the vacuum tube is being resiliently supported.

4. In a shock-proofing mounting for a vacuum tube, a frame, a resiliently suspended inertia member upon which said vacuum tube is mounted, an elongated member secured to said inertia member, springs extending between said elongated member and the frame for centering the inertia member therein, elements in said frame having apertures through which the extremities of said elongated member project, and means at each extremity for rigid engagement with said elements whereby the mounting may be secured against movement within the frame.

5. In a shock-proofing mounting for a vacuum tube, a frame, a socket for said vacuum tube, an inertia member upon which said socket is mounted, an elongated member secured to said inertia member, elements in the upper and lower portions of said frame having apertures therein through which the ex-

tremities of the elongated member project, and rigid means engaging said extremities for securing said vacuum tube mounting to the frame.

- 5 6. A shock-proofing mounting for a vacuum tube as claimed in claim 5 in which the element in the lower portion of the frame having an aperture therein is provided with a grooved portion and the elongated member is
10 provided at that extremity which passes through said aperture with means for engaging with said grooved portion.

7. A device to prevent movement of an ordinarily resiliently supported apparatus
15 mounting within a frame, comprising an elongated member having means at each extremity for rigid engagement with said frame.

8. A device to prevent movement of an ordinarily resiliently supported apparatus
20 mounting within a frame, comprising an elongated member having near one extremity a pin passing therethrough capable of engaging with an element of said frame, and at the
25 other extremity means thereon for rigidly securing said pin to said frame element.

In witness whereof, I hereunto subscribe my name this 27th day of September, 1929.

GEORGE R. LUM.

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