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HOLDER FOR ELECTRON TUBES

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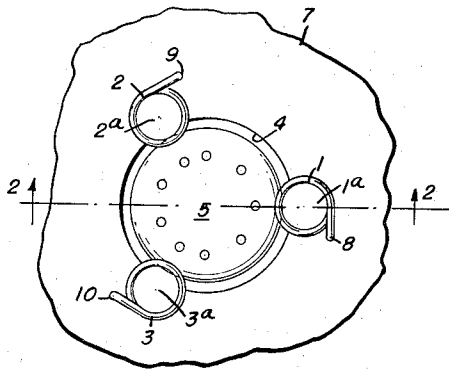


FIG. 1

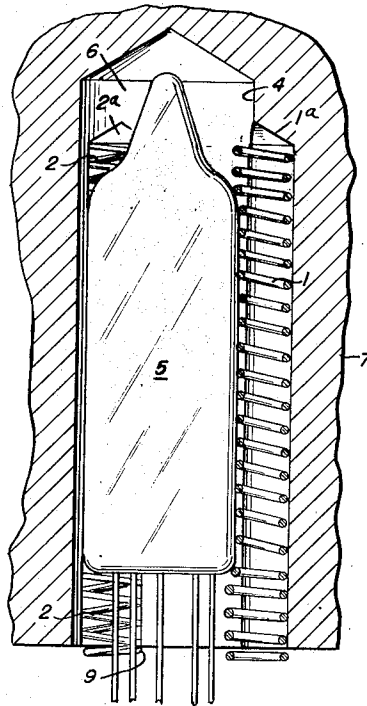


FIG. 2

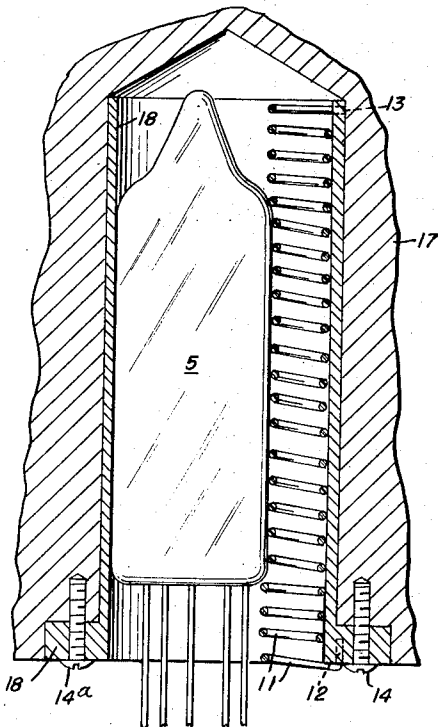


FIG. 4

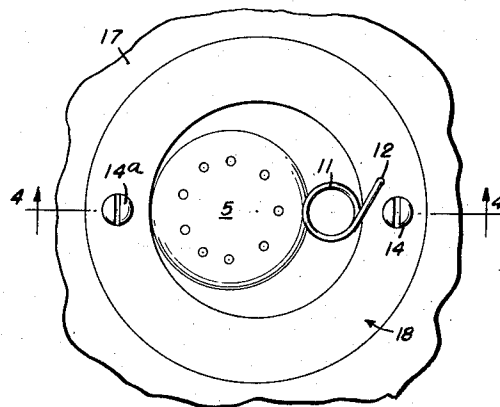


FIG. 3

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HOLDER FOR ELECTRON TUBES

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1 Claim. (Cl. 257—263)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

This invention relates to holders and more particularly to devices for holding electron tubes.

An object of the invention is a device for holding electron tubes that are subject to severe shock or vibration.

Another object of the invention is a device for holding electron tubes while permitting transfer of heat from said tubes by means of a positive contact along the entire length, or a portion thereof, of the tube.

Another object of the invention is a device for restraining electron tubes which is simple, rugged, dependable, economical and easy to manufacture.

Many tube holders are known, but it is believed that this invention is novel and provides a superior combination of holding power, vibration resistance, heat transfer, and adaptability for variations of tube size. Preferred forms of the invention use novel arrangements in which at least one helical spring, its axis equally parallel to the axis of the tube, provides firm holding contact along the wall of the tube.

The specific nature of the invention as well as other objects, uses and advantages thereof will clearly appear from the following description and from the accompanying drawing, in which:

Figure 1 is a bottom view showing a subminiature glass electron tube held in a holder in accordance with the invention.

Figure 2 is a partial longitudinal section taken along line 2—2 of Figure 1.

Figure 3 is a bottom view showing another arrangement in accordance with the invention.

Figure 4 is a partial longitudinal section taken along line 4—4 of Figure 3.

In the embodiment shown in Figures 1 and 2, helical springs 1, 2 and 3 are inserted in recesses 1a, 2a, and 3a located on the outer periphery of a recess 4 in a support 7 and said springs 1, 2, and 3 are affected to support 7

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at points 8, 9, and 10. A subminiature glass electron tube 5 is inserted into recess 4 establishing contact with helical springs 1, 2, and 3 along the outer periphery of said tube 5. Said contact causes helical springs 1, 2, and 3 to be compressed in a direction perpendicular to the axis of said tube 5 and distorts the contacted coils, introducing a moment arm at the periphery of each coil about the point of contact between each coil and the support 7. The resilient characteristics of the helical springs 1, 2, and 3 combine with the moment arms developed on the periphery of the coils to restrain and prevent withdrawal of tube 5 when the support 7 is subjected to severe shock or vibration. The numerous points of contact between the tube 5 and the helical springs 1, 2, and 3 allow adequate heat transfer.

In the embodiment shown in Figures 3 and 4, a helical spring 11 is located along the inner periphery of a hollow casing 18 at points 12 and 13. The hollow casing 18 is inserted into base material 17 and affixed at points 14 and 14a. An electron tube 5 is inserted into hollow casing 18, making contact with helical spring 11 and the inner periphery of hollow casing 18. The resilient characteristics of the helical spring 11 combine with the moment arms developed in the contacted coils and friction of the hollow casing's inner periphery restrain withdrawal and firmly hold the tube 5.

It will be apparent that the embodiments shown are only exemplary and that various modifications can be made in construction and arrangement within the scope of the invention as defined in the appended claim.

I claim:

In combination, a substantially cylindrical electron tube and a holder in which said tube is firmly restrained against movement so that said tube can withstand severe shock and vibration, said holder additionally providing good heat transfer away from said tube, said holder comprising: a support having a cylindrical bore therein, a cylindrical casing having a bore therethrough, said casing fixed in the support bore, a helical spring within the casing bore, said spring attached at one end to said casing and extending substantially the entire length of said casing bore, the longitudinal axis of said spring being parallel to, and offset from, the longitudinal axis of said casing bore, said electron tube being positioned intermediate said spring and the wall of said casing bore, said spring and said casing bore having diameters of such size relative to the diameter of said electron tube that said spring cooperates with said casing to resiliently press said tube into intimate lengthwise contact with the wall of said casing bore.

References Cited in the file of this patent

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