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ELECTRON TUBE SUPPORT AND COOLING DEVICE

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Fig. 1.

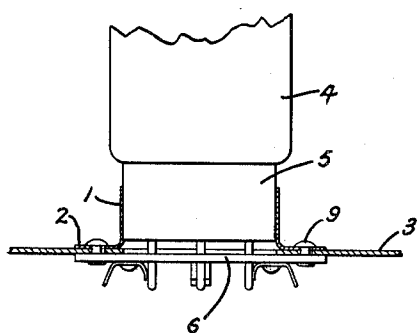


Fig. 3.

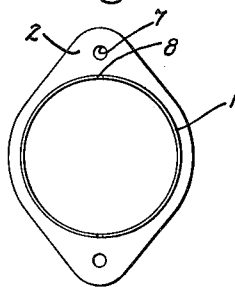


Fig. 2.

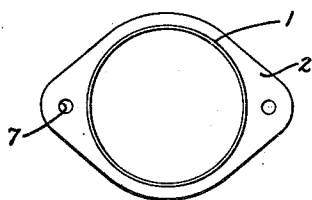
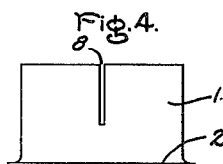


Fig. 4.



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ELECTRON TUBE SUPPORT AND
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2 Claims. (Cl. 173—328)

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This invention relates to mechanical supporting structures and more particularly to such structures useful for supporting electron discharge devices.

It is an object of this invention to provide a support for an electron discharge device by means of which, any tendency of the elements of the discharge device to vibrate at audio frequency due to external vibrations, such as from a loud-speaker, is obviated.

It is a further object of this invention to provide such a supporting structure having an additional function in that it acts as a heat conductor, whereby the heat dissipated by a discharge device is conducted away from the base thereof, hence allowing the use of a plastic tube socket in place of the ceramic types which are more expensive and less desirable for use at higher frequencies, and furthermore permitting the device to operate more efficiently due to lower temperature of the components contained therein.

The features of this invention which are believed to be new are set forth with particularity in the appended claims. The invention itself, however, together with further objects and advantages thereof may best be understood by reference to the following description when taken in conjunction with the accompanying drawing, in which, Fig. 1 shows a view, partly in section, of an electron discharge device supported by the proposed supporting structure, Fig. 2 shows a plan view of the support, Fig. 3 shows a plan view of a preferred modification of the support, and Fig. 4 shows an elevation of the modification of Fig. 3.

This invention contemplates an electron discharge device supporting structure for use in radio apparatus and the like. It is proposed to mount the structure solidly on the chassis of such apparatus, this mounting being preferably made by means of the rivets which normally serve to mount the tube socket associated with the supported electron discharge device, the support being so formed that it surrounds the base of the discharge device. It is further proposed that the supporting structure comprise a metallic spring clamp, whereby insertion of the discharge device into the tube socket, causes the clamp firmly to grip the base of the discharge device and rigidly hold the discharge device, thus obviating any tendency for the elements contained therein to vibrate due to external sources.

It is further contemplated to use such a support in conjunction with an electron discharge device having a metallic base, whereby tube heat nor-

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mally dissipated by the base of the discharge device is conducted directly to the chassis and away from the tube socket, hence allowing the use of plastic sockets, such as the polystyrene type in place of the ceramic type which is more expensive and less desirable for use at higher frequencies.

Referring now to Fig. 1, the proposed supporting structure is shown therein and comprises a flexible metallic cylinder 1. Cylinder 1 has a flanged base 2 formed in one end thereof for attaching the structure to the chassis 3 of radio apparatus, and the like. Cylinder 1 is shown as supporting an electron discharge device 4 at the base 5 thereof, discharge device 4 being mounted in a tube socket 6. As shown in Fig. 1 the supporting structure 1 is solidly mounted on chassis 3 by means of rivets 9, these rivets also serving to mount tube socket 6 on the chassis.

Fig. 2 shows a plan view of the proposed supporting structure, and, as shown in this figure, the structure comprises flexible metallic cylinder 1, having a flanged base 2 formed at one end thereof. Base 2 has mounting holes 7 formed therein, whereby the structure may be mounted on the above-mentioned chassis by means of rivets 9, and the like, together with the tube socket 6 as shown in Fig. 1. The diameter of the flexible metallic cylinder 1 is made such that it firmly engages the base of discharge device 4 supported by the structure.

Referring now to Fig. 3, a preferred modification of the device is shown therein, this embodiment differing from that of Figs. 1 and 2 only in that slots 8 are formed in the flexible cylinder 1, as shown, hence providing a more positive engagement between the structure and the base of the discharge device supported thereby. In this instance, the diameter of cylinder 1 is made slightly smaller than the base of the discharge device, and insertion thereof forces the sides of cylinder 1 outward, and insures snug fit of the discharge device base in the supporting structure.

Fig. 4 shows an end elevation of the modified structure of Fig. 3, with one of the slots 8 extending along the cylindrical section 1, as shown.

This invention, therefore, provides a supporting structure for an electron discharge device which is simple and economical to construct, and which prevents microphonic motion of the elements contained by the discharge device supported thereby and additionally acts as a heat conductor, conducting heat dissipated by the base of the discharge device directly to the chassis, and away from the tube socket.

The above-mentioned device is particularly useful in television receivers in which it had been found that polystyrene tube sockets, which are preferable for high frequency operation, melted due to the heat dissipated by the electron discharge devices. The use of the above-described supporting structure allows the incorporation of the preferred polystyrene tube sockets in the system and also results in higher output of the discharge device due to lower operating temperature of the elements contained therein. It was further found that in such receivers, the use of the aforescribed supporting structure effectively suppresses any tendency of microphonic motion of the tube elements, and hence obviates disturbances in the output of the system due to such motion.

While certain specific embodiments have been shown and described, it will of course be understood that various modifications may be made without departing from the invention. The appended claims are, therefore, intended to cover any such modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A heat conductive supporting structure for an electron discharge device of the type having a cylindrical metallic base portion and contact pin members projecting axially of said device from said base portion, said support structure comprising a chassis having a metallic wall with an aperture therein, a tube socket of thermoplastic material for receiving said contact pin members, said tube socket being attached to a surface of said apertured wall and overlying said aperture, and means for thermally shielding said socket from heat developed by said electron discharge device during operation thereof and for supporting said base portion of said device, said means comprising a flexible metallic cylindrical member constructed and arranged for tightly surrounding and frictionally engaging said base portion, said flexible metallic cylindrical member being positioned adjacent the surface of said apertured wall opposite that on which said tube socket is supported, the inner surface of said cylindrical member being arranged to be in close thermal contact with the outer surface of said base portion over a major portion of its area when said base portion is inserted in said socket, said member having a metallic flange formed integral therewith, said flange being secured to and engaging said apertured wall on said opposite surface thereof substantially entirely around said aperture to form

a path of high thermal conductivity between said base portion and said wall.

2. A heat conductive supporting structure for an electron discharge device of the type having a cylindrical metallic base portion and contact pin members projecting axially of said device from said base portion, said support structure comprising a chassis having a metallic wall with an aperture therein, a tube socket of thermoplastic material for receiving said contact pin members, said tube socket being attached to a surface of said apertured wall and overlying said aperture, and means for thermally shielding said socket from heat developed by said electron discharge device during operation thereof and for supporting said base portion of said device, said means comprising a flexible metallic cylindrical band member constructed and arranged for tightly surrounding and frictionally engaging said base portion, the normal diameter of said cylindrical band member being slightly smaller than the diameter of said base portion, said flexible metallic cylindrical band member being positioned adjacent the surface of said apertured wall opposite that on which said tube socket is supported, said cylindrical band member having two substantially diametrically opposite slots to facilitate insertion of said electron discharge device in said socket, the inner surface of said cylindrical band member being in close thermal contact with the outer surface of said base portion over a major portion of its area when said base portion is inserted in said sockets, said cylindrical band member having a metallic flange formed integral therewith, said flange being secured to and engaging said apertured wall on said opposite surface thereof substantially entirely around said aperture to form a path of high thermal conductivity between said base portion and said wall.

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