Feb. 11, 1941. F. C. BLANCHA 2,231,490

MOUNTING FOR ELECTRON TUBES

Filed Dec. 31, 1937

FIG. 1.

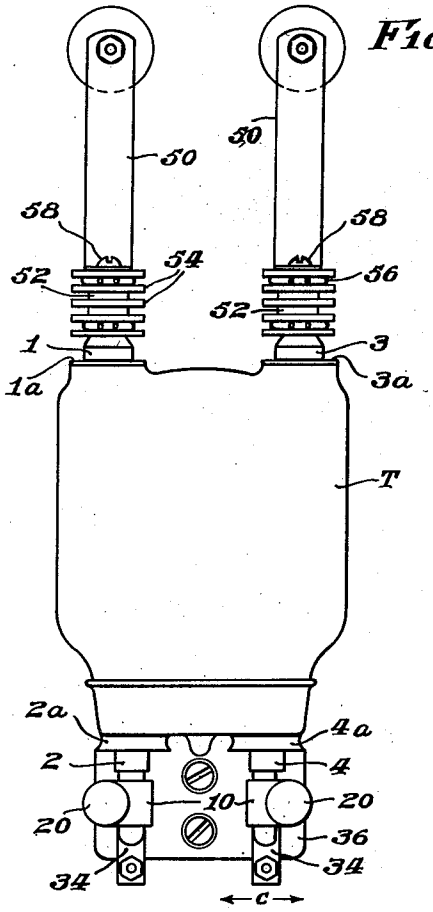


FIG. 2.

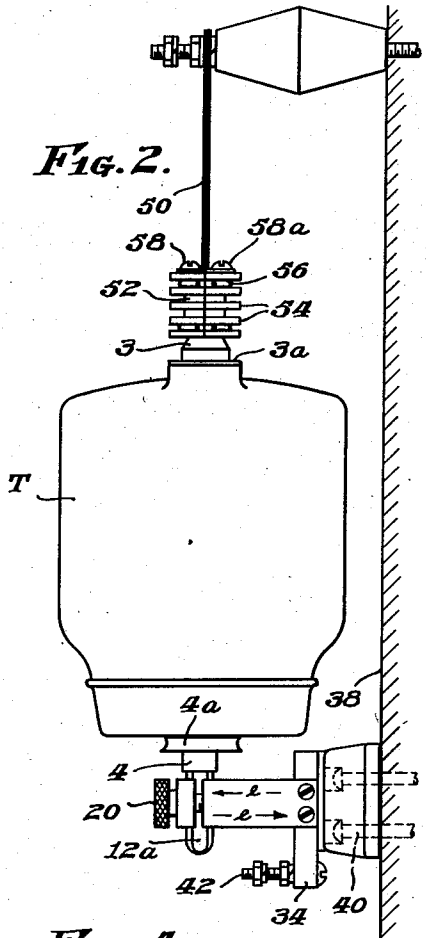


FIG. 3.

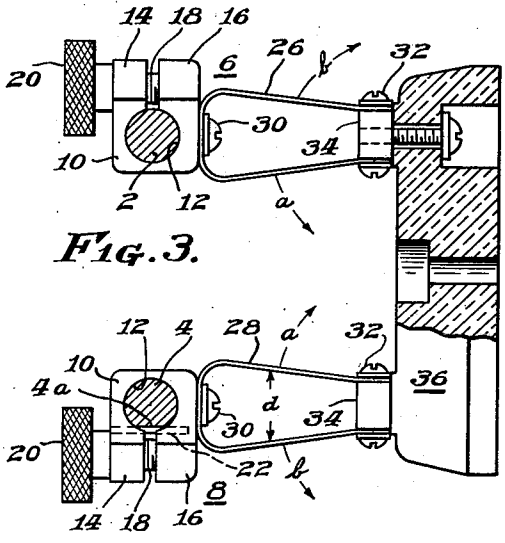


FIG. 4.

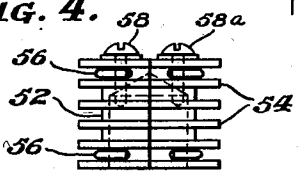
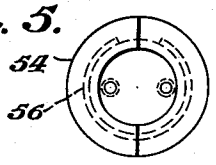


FIG. 5.



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2,231,490

MOUNTING FOR ELECTRON TUBES

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4 Claims. (Cl. 173—328)

This invention relates to the mounting of electric discharge devices and has special reference to the mounting of so-called "short wave" or "high frequency" electron tubes.

The contacts usually provided in sockets for radio tubes are flexible so that electrical connections may be made to the tube in spite of minor inaccuracies in the spacing or alignment of its prongs. Misaligned and mis-spaced prongs are likely to be encountered, not only in ordinary tubes made by mass production methods, but also in "special purpose tubes," such, for example, as short-wave tubes wherein the electrode leads terminate in prongs which extend directly through the tube walls instead of being connected to prongs affixed to a dependent base. Although flexible contacts are quite satisfactory in circuits designed for broadcast and long-wave bands, their use in short-wave work is not desirable because such contacts present a high impedance to the flow of high frequency currents.

Accordingly, a principal object of the present invention is to provide a mount incorporating means for establishing a low impedance connection to the prongs of an electron discharge tube, and this, too, in spite of inaccuracies in the spacing and alignment of the tube prongs.

Another and important object of the invention is to provide a resilient mount for electron tubes of the type having directly affixed dependent prongs, and one adapted to protect the tube against shocks and tremors without undue strain upon the prongs and seals of the tube.

Another object of the invention is to provide a simple inexpensive and trouble-free mount for a short-wave transmitter tube, such, for example, as an RCA #833.

Certain details of construction, together with other objects and advantages will be apparent and the invention itself will be best understood by reference to the following specification and to the accompanying drawing, wherein

Figure 1 is a front elevational view and Figure 2 a side elevational view of a short-wave transmitter tube mounted in accordance with the principle of the invention,

Figure 3 is a top plan view, partly in section, of the mounting of Figs. 1 and 2,

Figure 4 is an enlarged elevational view, and

Figure 5 is a plan view showing certain details of construction of the grid clamp employed in Figs. 1 and 2.

While the invention is disclosed as embodied in a mounting designed to receive the four prongs of an RCA #833 short-wave transmitting tube, it will be obvious as the description proceeds that the invention is applicable to tubes employing a greater or less number of prongs.

The tube T of the drawing has four prongs, 1 to 4, inclusive, which extend through appropriate metal-to-glass seals 1*a*, 2*a*, etc., to the interior of the envelope. The "upper" prongs 1 and 3 will be understood to extend, respectively, to the grid and anode electrodes and the "lower" prongs 2 and 4 to the cathode, not shown, within the tube. The lower or cathode prongs 2 and 4 in this case bear the weight of the tube T. Owing to the difficulties incident to the formation of metal to glass seals the tube prongs may be imperfectly spaced and aligned so that one of the problems encountered in the mounting of the tube is to compensate for such inaccuracies without any sacrifice in the electrical continuity between the tube prongs and an external circuit.

Excellent electrical continuity is achieved, in acordance with the invention, by the provision of individual, relatively massive, clamps 6 and 8 (Fig. 3) for the lower tube prongs 2 and 4. Referring to Fig. 3: each of these clamps 6 and 8 is preferably constituted by a bifurcated body member 10 of appreciable mass containing a vertical central orifice 12 in which one of the prongs may be seated. The bifurcated arms of each body member 10 are designated 14 and 16; each contains a laterally aligned threaded orifice 18 which accommodates a screw 20. Screw 20, when tightened, serves to draw the arms 14 and 16 together whereby they exert a positive clamping force about the tube prong in the central orifice 12.

In order to prevent the inadvertent insertion of a prong in the wrong clamping member, one of the prongs, say prong 4, may be provided with a cut-away portion adjacent its periphery, as indicated at 4*a*, Fig. 3, and the clamping member individual thereto may be provided with a pin 22 adjacent the cut-away portion which will admit the flattened prong 4*a* but prevent the insertion of a round prong.

The clamps 6 and 8 are mounted on separate resilient supports 26 and 28, respectively. Supports 26 and 28 are preferably each in the form of a ribbon-like spring bowed in the form of a U, and the adjustable clamps 6 and 8 are connected respectively thereto as by screws or rivets 30. The othewise open end of each U-shaped spring is affixed as by screws 32 to bus bars 34 (Figs. 1 and 2), which are secured to a porcelain or other insulating base 36, which may, in turn, be affixed to a panel or wall 38 by bolts 40. The

bus bars 34 extend downwardly from the base and are each provided at the lower end with a suitable binding post 42 to which electrical connections are made to the tube prongs 2 and 4 through the U-shaped springs 26—28 and clamping members 6 and 8.

It will be apparent from an inspection of Fig. 3 that the arms 26—28 are capable of being so flexed, turned, twisted, or bowed, as to compensate for any type of inaccuracy in the spacing or alignment of the prongs of the tube to be mounted thereon. Thus, assuming the prongs 2 and 4 to be parallel but spaced from each other a distance greater or less than a "standard" distance, in this case the arms or one of them may be flexed in the direction of the arrows *a* or *b* to permit the prongs to be inserted in the clamps 6 and 8. Should one of the prongs, say prong 4, be out of parallelism with the other prong, then the arm individual thereto will be flexed in the direction of the arrow *c* (Fig. 1). On the other hand, if the base of one or both of the prongs is correctly centered but the free ends are inclined inwardly, or outwardly, the flexible arms will be bowed in the direction of the arrows *d* (Fig. 3) and the top or bottom edge portions of these ribbon-like members will at the same time be twisted in one way or another as determined by the direction (arrows *e*, Fig. 2) of the inclination of the prongs.

If desired, a mount of similar construction may be provided for the upper (grid and anode) prongs of tube T. However, since the weight of the tube is borne by the lower mounting elements 26 and 28, the leads for the grid and anode prongs 1 and 3 may be mere straight metal-ribbons 50 flexible enough to permit of a limited range of movement of the tube on its said lower resilient mounting elements.

In order to ensure rapid dissipation of heat from the region about the grid and anode electrodes 1 and 3, and the metal to glass seals 1*a* and 3*a*, each lead 50 has affixed thereto a cap 52 provided with heat radiating fins 54. The caps 52 are of bi-part construction, each part constituting one-half of a cylinder whose internal diameter is preferably very slightly smaller than that of the prong which it surrounds. One or more annular springs 56 (Fig. 5) which fit in the grooves between the fins 54 urge the inner surfaces of the separable parts of the cap in intimate contact with the prongs. Screws 58, 58*a*, one for each cap part, serve to tie the flexible leads 50 to the top surface of these electrode connectors. In positioning the caps on the prongs, a force-fit is made by pressing the caps downwardly thereon.

Certain modifications of the invention will suggest themselves to those skilled in the art. It is to be understood, therefore, that the foregoing is to be interpreted as illustrative and not in a limiting sense except as required by the prior art and by the spirit of the appended claims.

What is claimed is:

1. A mount for electron discharge tubes of the type having a plurality of substantially parallelly arranged prongs extending outwardly from opposite ends of said tube, said mount comprising a base, a clamping element for each of said prongs and including means adapted to exert a positive clamping force about said prongs, a flexible support affixed to said base and comprising a plurality of bowed springs to which are respectively affixed the clamping elements which are individual to the prongs at one end of said tube, said clamping elements comprising female members adapted to receive the prongs in the direction of their axes and said bowed springs extending from said base in a direction substantially normal to the said axes of said prongs, the clamping elements individual to the prongs at the opposite end of said tube being supported substantially on the prongs which they engage and being removable therefrom to permit of insertion of the opposite set of prongs in their flexibly supported clamping elements, and a plurality of flexible leads to which said removable clamping elements are affixed.

2. In a device of the character described, an adjustable clamp for receiving a prong of an electron tube, a resilient support comprising a U-shape spring to the base of which said adjustable clamp is affixed, and an insulating support to which the ends of said spring are secured.

3. In a device of the character described, an insulating base, a plurality of U-shape resilient members having their free ends affixed in spaced relation to said base and extending outwardly therefrom in substantially parallel relation, and an adjustable clamp adapted to receive a prong of an electron tube secured to the outer surface of the base of each of said U-shape members.

4. In a device of the character described, an insulating support, a U-shape spring supported at its ends on said support and having a clamp secured to its base, said clamp comprising a U-shape member adapted to receive a prong of an electron tube within the U, and an adjustable member spanning the arms of the said U for exerting a positive clamping force to said spring.

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