

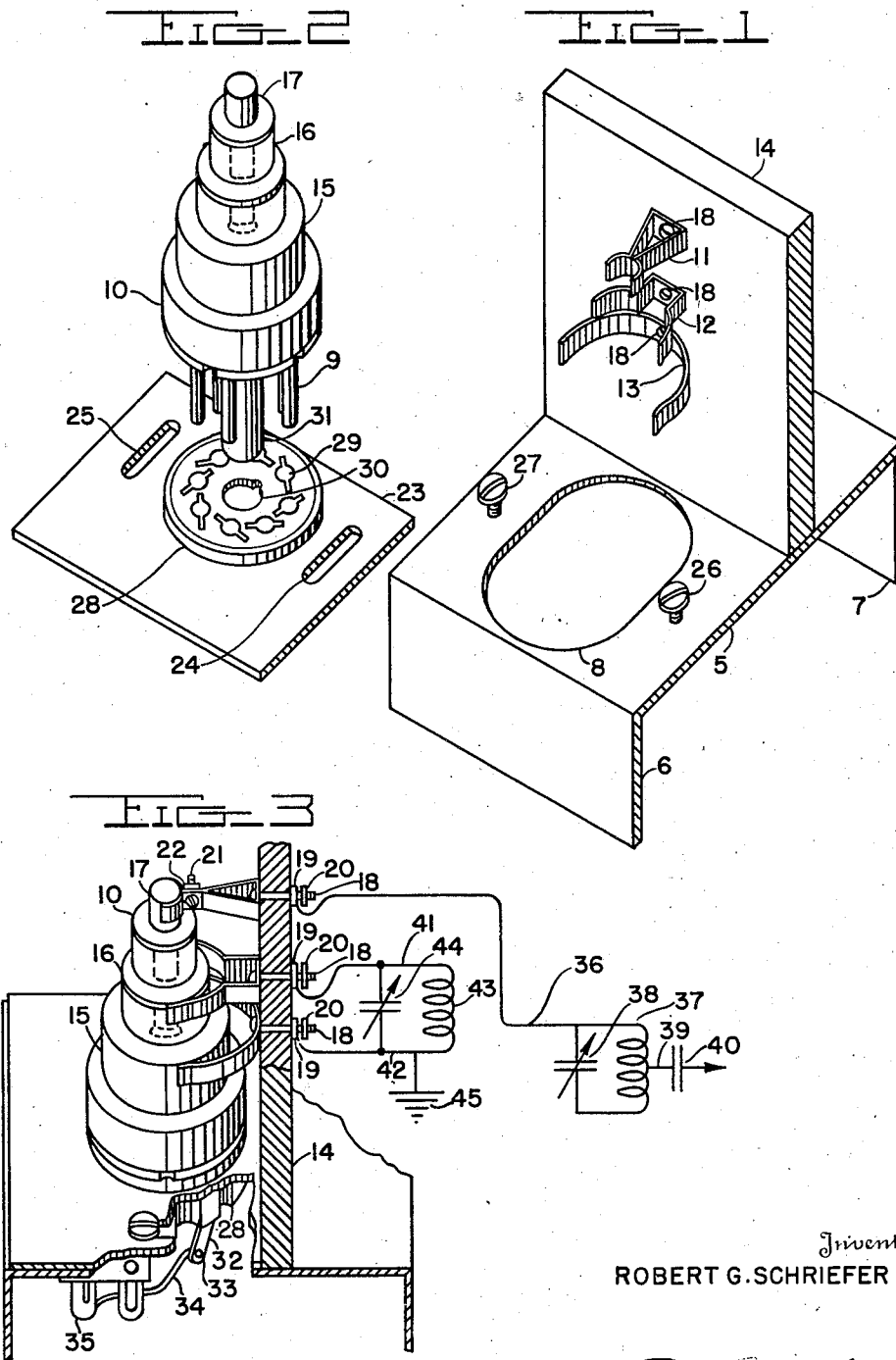
April 9, 1946.

R. G. SCHRIEFER

2,397,985

LIGHTHOUSE TUBE MOUNTING

Filed Dec. 29, 1944



Inventor
ROBERT G. SCHRIEFER

334

J. B. Burk

Attorney

UNITED STATES PATENT OFFICE

2,397,985

LIGHTHOUSE TUBE MOUNTING

Robert G. Schriefer, Fort Wayne, Ind.

Application December 29, 1944, Serial No. 570,424

6 Claims. (Cl. 250-27.5)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to socket devices for electron discharge tubes and is particularly directed to the problem of mounting and effecting the proper electrical connections to a specific type of such tubes.

The tube with which the present invention is particularly designed for use is commonly called the lighthouse tube. The tube is provided with a conventional base having terminal prongs extending therefrom for supplying energy to its heater and cathode. Additional annular electrode contacts are positioned above the base of the tube, each electrode being successively of decreasing size as the top of the tube is approached. These tube electrodes are normally connected to downwardly projecting tubular electrodes, forming part of a resonant coaxial housing, whereby they abut facewise on the tube's electrodes, to complete their output circuits. Such construction while useful in special applications, constitutes an unduly complicated and expensive mounting for many uses of these tubes.

From the foregoing it will be apparent that when the housing and tube are assembled in the apparatus in which they are to be used, it may be difficult to replace the tube and the time required for doing so may be considerable.

Accordingly, it is an object of this invention to provide an improved mounting assembly for a lighthouse tube which will permit its ready removal or replacement.

A further object of this invention is to provide an efficient detachable tube mounting without interference to the leads connecting the tube's input terminals.

Yet another object of the invention is to provide connections for engaging the output terminals of the tube wherein the capacity between these connections is minimized by their dimensions and location.

Other objects and advantages of the present invention will be apparent from the following detailed description taken in conjunction with the drawing, wherein:

Figure 1 is a perspective view of the chassis with the socket mounting plate removed therefrom to show clearly the clip connections for the tube's plate, grid, and cathode;

Figure 2 is a perspective view of the socket mounting plate showing the socket attached thereto and a tube of the type to be used therein, elevated therefrom, and;

Figure 3 is a perspective view of the elements of the mounting showing the relationship of the tube, socket and chassis as well as a view of the

mounting, broken away to illustrate details of socket and chassis connections employing a flexible lead therebetween; also shown, is a portion of the tube's output circuit.

Referring now to the drawing and particularly to Figure 1, a mounting assembly is there illustrated comprising an apertured platform section, which as shown, may constitute a chassis portion 5 with supporting side plates 6 and 7 at the front and rear edges respectively and extending downwardly therefrom at substantially right angles thereto. The platform 5 being of metal acts as an electrostatic shield whereby the interfering fields of an electron discharge tube supply leads and those of its output circuits are segregated. An elongated aperture 8 having rounded ends is formed through the central portion of the platform 5 and is of sufficient dimensions to permit the prongs 9 to move longitudinally in the aperture. These prongs 9 extend from the base of tube 10, and are engaged by a socket 28 as shown in Figures 2 and 3. The electron discharge device 10 is an exemplary embodiment, used for purposes of illustration, of the lighthouse tube, which derives its name from the similarity of its terraced body, enlarged base and pronged end, to a lighthouse. The output electrodes of the tube are vertically spaced, and in coaxial relation to each other, each electrode decreasing in diameter as the top of the tube is approached. The largest electrode, near the base of the tube, is the cathode terminal 15, next electrode is the grid ring 16 and lastly the anode cap 17. A plurality of electrode engaging clips 11, 12, and 13 are supported from the chassis, as by an insulated support 14, to overlie the aperture 8.

The electrode clips 11, 12, and 13 of bifurcated construction are formed of flat spring material such as plated brass, and are secured in spaced relation edgewise to each other whereby capacity between the clips are kept to a minimum. Bolts 18 extending through the support 14 rigidly anchors the clips by threading and tightening the nuts 19 thereon, while the leads of the tube's output circuits may be connected to the bolts by other nuts 20 threaded thereon. The two side portions of the spring material of clip 11 may be brought sharply together, and secured by weld or bolt 21 and nut 22 just short of its arcuate electrode engaging end to form a triangle for clamping the tube's plate or cap electrode 17 as shown in Figures 1 and 3. Electrode clip 12 has a squared base portion with diverging arcuate shaped arms radiating therefrom which is

adapted to engage the electron discharge tube's grid ring 16, while the cathode's output electrode 15 is engaged by the semicircular clip 13.

A mounting plate 23 of metal or other material having slots 24 and 25 therein is slid on the platform 5 and when said slots overlie the tapped openings, not shown, in the platform provided for screws 26 and 27, they may be inserted through the slots for threaded engagement with the openings, and when tightened, will rigidly secure the mounting plate 23 to platform 5, and when loosened, will permit said plate to be moved laterally on said platform a distance determined by the slots. Centrally of the mounting plate 23 is formed a circular aperture, not shown, for installation of a conventional socket 28 provided with radially disposed, slotted openings 29, formed in its top, for the reception of the prongs 9 of tube 10. A suitably formed socket aperture or keyway 30 is provided in the center of the socket for the reception of a splined guide key 31 projecting from the center of the tube 10 and extending beyond the prongs 9.

When guide key 31 of tube 10 coincides with the keyway 30 of socket 28 the tube's input connection prongs 9 may be forced into their correct openings 29 on the socket, which further guides the prongs into engagement with connector clips 32. Each clip 32 has a connection lug portion which extends from the bottom of socket 28, and is provided with an opening 33 near its end for receiving an end of a flexible cable of Litz or other plural stranded wire 34 which may be mechanically connected and soldered thereto, one of such connection lugs being shown in the broken away portion of Figure 3. The other end of wire 34 is connected to a terminal lug 35 mounted to the underside of platform 5 and insulated therefrom. The wire being of such a length that the mounting plate 23 may be moved the full length of slots 24 and 25 without strain being placed thereon. It is obvious that circuit connections may be made from several connection lugs 32 to a plurality of other similar terminal lugs 35 in any appropriate manner to complete the tube's base electrode circuits.

The circuit elements of the tube as shown in Figure 3, constitutes an oscillator circuit. The plate electrode clip 11 is connected by a wire 36 to a plate tank circuit comprising an inductance 37 with a variable capacitor 38 in parallel thereto, and a tap 39 taken from the inductance is connected to a suitable load circuit through a series capacitor 40. Grid clip 12 and cathode clip 13 are connected by leads 41 and 42 to a grid-cathode tank circuit comprising an inductance 43 and a variable capacitor 44 in shunt thereto while the ground 45 connected to the cathode end of inductance 43 maintains the proper ground potential on the cathode circuit.

In the operation of the invention (assuming that the mounting plate 23 having socket 28 mounted thereon, is slidably secured to the platform 5) it is only necessary when it is desired to place a tube in its socket, to slide the plate away from support 14 within the limit of the slots of the mounting plate and insert a tube 10 within its socket 28. When the tube has been seated in the socket 28 its prongs 9 will have established the circuit contacts for the shell, heater and cathode. When the mounting plate is slid towards the support 14, it will be observed that the electron discharge tube's plate, grid, and cathode electrodes will be engaged by their respective clips

on the support 14 to complete the tube's load circuits.

It is understood that the foregoing embodiment described 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.

The invention described herein may be manufactured and used by or for the Government of the United States of America for government purposes without the payment of any royalty thereon or therefor.

What is claimed is:

1. A mounting assembly for a tube including a chassis comprising a platform and a support associated therewith, a slidable mounting plate, a socket secured to said slidable mounting plate for receiving said tube, locking means on said platform for engaging said mounting plate and clips on said support for engaging said tube.
2. In combination a chassis having a platform, a support extended therefrom, a mounting plate adapted for movement on said platform, a tube mounted on said mounting plate, clips on said support overlying said platform and engageable with said tube when the mounting plate is moved toward said support.
3. In combination, a chassis having a platform, a support extended therefrom, a mounting plate adapted for movement on said platform relative to said support, a socket carried by said mounting plate, a tube having output electrodes in coaxial relation to each other secured to said socket, and electrode clips on said support engageable with said tube when said mounting plate is moved toward said support.
4. A mounting device for an electron discharge tube having a pronged base and vertically spaced outer annular contacts, comprising a platform, a mounting plate slidably positioned on the platform, a prong receiving socket carried by the mounting plate and extending below the same, an elongated aperture in the chassis underlying said socket to accommodate its movement on adjustment of the slidable mounting plate and contact means mounted above the platform and positioned to overlie the prong receiving socket in one position of the mounting plate to engage the outer annular tube contacts, whereby the tube may be inserted in the prong receiving socket in one mounting plate position and then moved to effect engagement of the contact mounted above the platform with the annular tube contacts in another mounting plate position.
5. A mounting device for an electron discharge tube having a pronged base and spaced outer annular contacts, comprising a chassis, a mounting plate slidably positioned on the chassis, a prong-receiving socket secured to said mounting plate, flexible leads connected to said socket from said platform, an elongated aperture in said chassis underlying said socket to accommodate movement or adjustment of the slidable mounting plate, and contact clips mounted above the platform and positioned to overlie the prong receiving socket in one mounting plate position whereby contact is made with said electron discharge device outer annular contacts and will permit removal of said electron discharge device when the mounting plate is moved to another position.
6. A mounting assembly for an electron discharge device having at one end a plurality of vertically spaced electrodes in coaxial relation to each other and prongs at its other end, compris-

ing a chassis having a platform, a plurality of contacts supported from said chassis, a slotted mounting plate carried by and adapted for movement on said platform, a socket secured to said mounting plate and adapted to receive said electron discharge device, means for clamping said slotted mounting plate to said platform whereby

in a first position the slotted mounting plate may be in an operating position underlying said contacts for said spaced electrodes to be engaged thereby and said mounting plate being adapted to be moved to a second position to permit removal of said electron discharge device.

ROBERT G. SCHRIEFER.