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H. D. CURRIER

1,782,411

SOCKET

Filed March 19, 1925

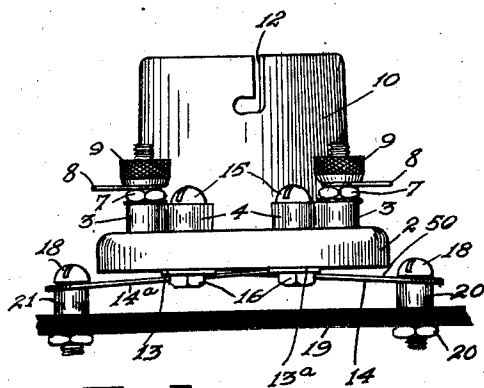


Fig. 1.

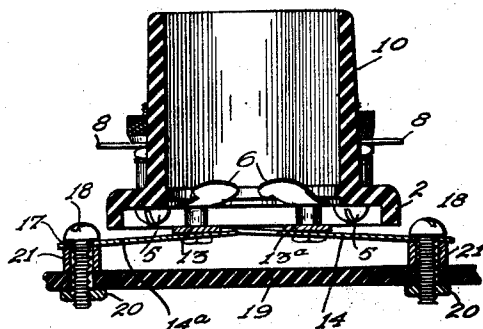


Fig. 2.

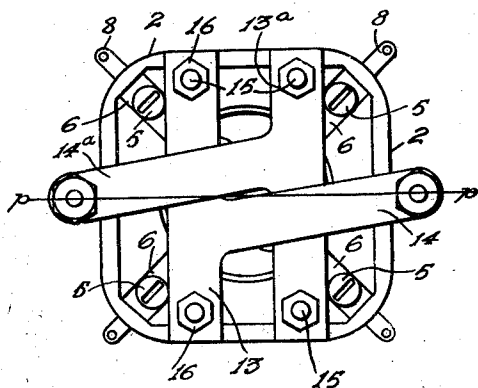


Fig. 3.

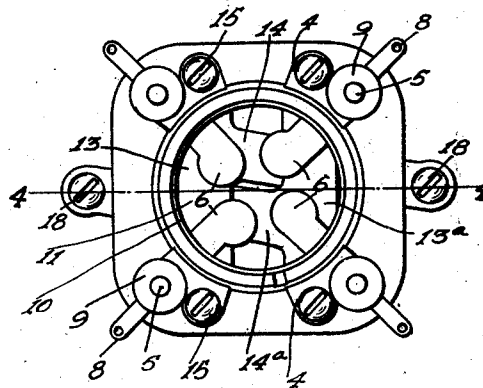


Fig. 4.

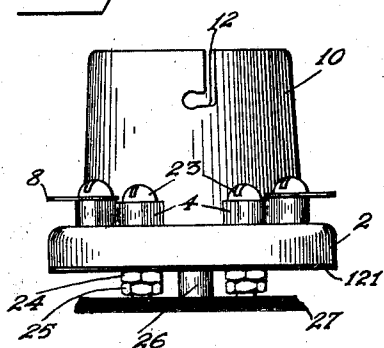


Fig. 5.

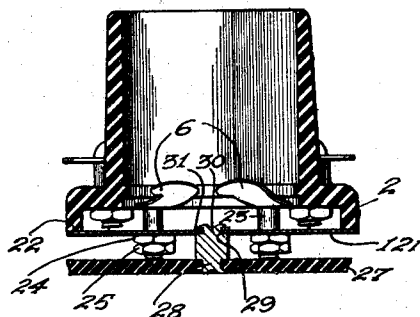


Fig. 6.

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UNITED STATES PATENT OFFICE

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SOCKET

Application filed March 19, 1925. Serial No. 16,623.

My invention relates to sockets but has to do more particularly with sockets such as are used in radio work for the holding of audion tubes. The ordinary vacuum tube in addition to having contact prongs, is provided with a pin secured to the side of the tube base and adapted to be inserted into a bayonet slot for holding the tube against displacement and at the same time hold the prongs of the tube in engagement with the terminal springs. Tube sockets of the kind now in use are adapted to be secured rigidly to the base of the set in which they are used. When this is done the tubes are subject to the vibrations and jars which take place in the vicinity of the set in which the sockets are used. These jars cause the sound produced by the action of the set to be distorted. Tubes securely mounted to a base are also subject to take up an intervibration between the stages, and when the elements start vibrating a vibratory noise is produced in the receiver. This is particularly noticeable with the more sensitive tubes and sets, and with the finer constructed tubes. Tube noises have always been a source of annoyance.

A feature of my invention is the provision of novel means for supporting the tube socket so it will be free to take up any jar which may occur. It has been found that a vacuum tube inserted in a socket so supported that the tube and socket can move or vibrate as a whole obviates the faults of the securely mounted tube.

My method of supporting the tube socket not only obviates the tube vibration but also overcomes many of the tube noises heretofore noticed in the operation of audion tubes.

For a more complete understanding of my invention reference may be had to the accompanying drawing in which like reference characters in the different views denote like parts and in which;

Fig. 1 is an elevation of a tube socket supported by means of my invention;

Fig. 2 is a sectional view along the line 2-2 of Fig. 4;

Fig. 3 is a bottom view of Fig. 1;

Fig. 4 is a plan view of Fig. 1;

Fig. 5 shows a modified form of my invention;

Fig. 6 is a sectional view of Fig. 5.

Referring now more in detail to my invention it comprises a tube socket composed of any suitable insulating material such as bakelite. It comprises a moulded base 2 which has integrally formed lugs 3 and 4, the lugs 3 being provided with suitable orifices through which screws 5 extend to secure the spring terminals 6 in place, which terminals engage the prongs of a vacuum tube when it is inserted in the socket. Nuts 7 are provided to secure the screw 5 against movement and suitable terminals 8, which are held in position on the screws 5 by knurled nuts 9 which have screw threaded engagement with the screws 5, are provided for the usual connections with external flexible conductors. The lugs 4 are also provided with suitable orifices the purpose of which will be described later. The base 2 has integrally formed therewith an upwardly extending cylindrical socket wall 10 whose opening 11 is of a size to fit a standard vacuum tube. An orifice or bayonet slot 12 is provided for engagement with a pin formed on the base of the tube. For a further description of the tube socket reference may be had to the pending application of Emil J. Nielson S. N. 589,766, filed September 22, 1922, now Patent No. 1,653,869.

The supporting member consists of a pair of members 13 and 13^a composed of any suitable thin flexible material such as fibre or muslin coated bakelite which have extending arms 14 and 14^a and has the method of fastening these members 13 and 13^a to the tube socket is similar in each case a description of one will suffice. The member 13 is of a length equal to the width of the tube socket, and orifices are provided near each end of the member 13 which when placed in position with the socket will be directly in line with the orifices provided in the lugs 4. Screws 15 are inserted in the orifices in the lugs 4 and orifices in the ends of the member 13. Nuts 16 which have screw threaded engagement with the screws 15 are turned down to hold the socket and supporting member 13

together. Similarly member 13^a is held in position on the tube socket. The extensions 14 and 14^a are of a length to extend beyond the base 2 of the tube socket and these extending portions are provided with orifices 17 through which are inserted screws 18 which extend through a baseboard 19 to which the socket is to be attached. Nuts 20 are provided to secure the screws 18 from movement and collars 21, which are of a suitable height to keep the socket from coming into contact with the baseboard 19, are provided to be placed on the screws 18 between the ends of the extensions 14 and 14^a and the baseboard 19. The extensions 14 and 14^a are so designed that, when the supporting members 13 and 13^a are placed in position with the sockets, the extension 14 passes under the member 13^a and the extension 14^a passes under the member 13 and thus serve as added supports. These extensions 14 and 14^a are so positioned in regard to the length of the members 13 and 13^a, and are pitched at predetermined angles, and are of such a length that the supporting screws 18, which are inserted in the orifices in the ends of the extensions 14 and 14^a, are in a vertical plane which is substantially at right angles to the tube socket. This plane which may be shown as the line *p-p* in Fig. 3, passes through the exact center of the tube socket and consequently the weight of the tube socket and of the vacuum tube inserted in it will be evenly distributed between the screws 18 and will cause the tube socket and tube to remain on an even keel. The extensions 14 and 14^a are slightly flexible but of sufficient strength to support the tube socket. If for any reason the radio receiving set is jarred or moved the tube will not receive a quick jolt and cause a distortion of sound, instead there will be no distortion because the tube and its socket are not rigidly supported to the base. But the tube and socket will as a whole quiver or vibrate due to the flexibility of the extensions 14 and 14^a which balance the tube and socket. The jar will cause the tube to be unbalanced and this shifting of weight will cause the flexing of the extensions 14 and 14^a. It will be readily understood by one familiar with the art that there is no sudden jolting of the tube when it is jarred but instead the tube is set quivering slightly and this quivering gradually slows up and finally stops.

Figs. 5 and 6 illustrate a modified form of my invention. In this type a diaphragm 121, composed of any suitable insulating material such as thin fibre or the like, equal in size and of the same size as the base 2 of the socket is fitted against the peripheral edge 22 of the base 2 and held in position by means of screws 23, which extend through orifices in the lugs 4 and diaphragm 121, and nuts 24 and lock nuts 25 which have screw threaded

engagement with the screws 23. A post 26 is secured to a base 27 by having a reduced portion 28 inserted in a suitable orifice provided in the baseboard 27 and then spinning over the end of the post 26 which rests in a countersunk portion of the base 27. The other end of the post 26 is inserted in a suitable orifice 29 located in the exact center of the diaphragm 121 and its protruding end 30 is inserted in a washer 31 and then spun over to hold the same in place and to support the tube socket as a whole on the post 26. The screws 23 are of a length sufficient to extend into orifices in the base 27 to prevent the tube socket from rotating as a whole around the post 26.

When a vibration of any sort either mechanical or air wave is transmitted to the receiving set the tube and socket, which are only supported by the post 26 which is in the exact center of the diaphragm 121, will be unbalanced and started quivering due to the fact that the socket is only supported at the post 26. The external conductors connected to the terminals of the socket being flexible to some degree do not interfere with the supporting means taking up the vibrations transmitted to the tubes.

Referring again to the structure shown in Figs. 1 to 4 inclusive, it will be noticed that the arm 14 crossing the strip 13^a causing the arm 14 to be flexed down slightly, so that it is free from the lower peripheral edge of the socket as at 50. The same is true of the arm 14^a. This method of construction causes the socket to be yieldingly supported from a point near the center thereof.

While I have illustrated and described a particular embodiment of my invention it is to be understood that I do not desire to be limited to the exact structure as shown and described, but intend to cover all such changes and modifications as come within the spirit and scope of the appended claims.

Having described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. A device of the character described comprising a tube socket, a baseboard, and a pair of flexible supporting members each having a main portion and an integrally formed flexible extension arm adapted to pass under the main portion of the other member and provided with orifices lying in the same vertical plane adapted to engage screws to balance the said tube socket and to non-rigidly support the said tube socket in mobile relation to the said baseboard.

2. A device of the character described comprising a tube socket, a baseboard, a pair of flexible supporting members, flexible extension arms integrally formed with said supporting members, said extension members forming a yielding means of support for the member of which it is an integral part and

also serving as a means of support for the other of said supporting members, and for the tube socket.

3. A device of the character described comprising a tube socket, a baseboard, a pair of
5 supporting members each having a main portion, extension arms integrally formed with said main portion of said supporting members and so arranged that the said arms extend parallel to each other and pass under
10 and support the main portion of the other supporting member so that the said tube socket is non-rigidly and movably supported on said baseboard at a substantially central point.

15 Signed by me at Chicago, in the county of Cook and State of Illinois, this 17th day of March, 1925.

HIRAM D. CURRIER.

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