Oct. 20, 1931. W. H. PUMPHREY 1,827,909

VACUUM TUBE SOCKET

Filed June 30, 1928

Fig. 1.

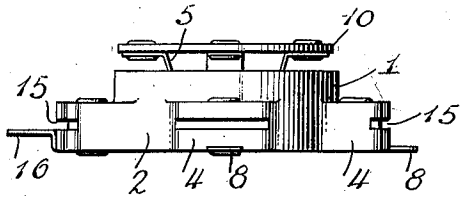


Fig. 2.

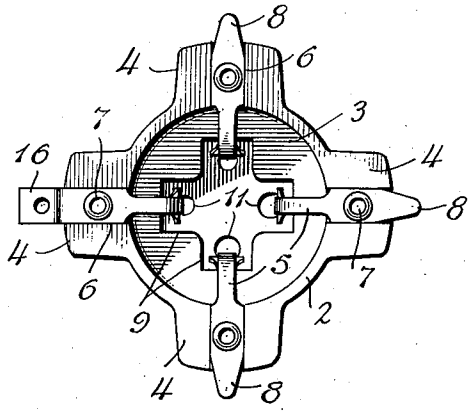


Fig. 3.

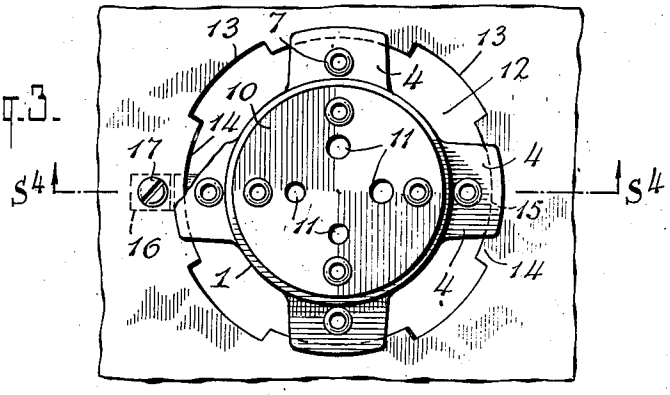
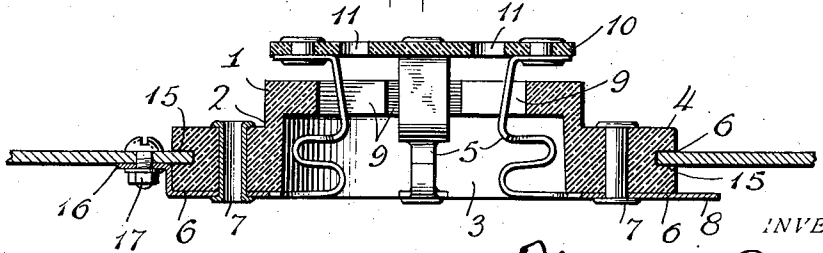


Fig. 4.



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UNITED STATES PATENT OFFICE

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VACUUM TUBE SOCKET

Application filed June 30, 1928. Serial No. 289,567.

My invention relates to certain improvements in vacuum tube sockets.

While the above referred to Grebe socket, as designed, may be riveted, bolted or otherwise secured directly upon the upper side of the deck, platform or like support of a radio receiver of other piece of apparatus, such an arrangement gives rise to many disadvantages and short-circuit risks and the usual and preferable practice is, therefore, to secure the socket upon the lower side of the deck plate, in centered relation to an opening therein, through which the reduced portion of the socket projects to present the seat for the base of the tube and its terminal contact pins.

Mounted as last mentioned, the socket must be placed in position from the lower side of the deck plate and lined up both for the rivet or bolt holes therein and also to bring the soldering lugs of the various spring contacts of the socket into proper relation with their particular circuit wires. This involves difficult manipulation of the large deck plate, which is rather awkward to handle and, in addition to requiring more or less skill, takes considerable time.

With these disadvantages in mind, it is the object of the present invention to produce a socket which will present the soldering lugs of the spring contacts on the underside of the deck plate for convenient connection with the circuit wiring and which is so designed as to be entered in position for attachment to the deck plate from either the upper or lower side thereof.

A further object is to provide a simple, definite and positive guide for positioning the socket on the deck plate, so as to unfailingly bring its various soldering lugs into relation for connection with the proper circuit wires.

A further object is to dispense with rivets, bolts or the like, in securing the socket to the deck plate, by so shaping the socket and the opening in the deck plate in which it is fitted that when the socket is given limited rotation therein, grooved projections of the socket will engage and interlock with lugs projecting into the opening to secure the socket firmly in position.

A further object is to provide a simple, effective and inexpensive ground connection through the socket for the filament of the tube, by extending the length of one of the spring contacts of the socket and securing the extension fast to the adjoining deck plate by a bolt, in preference to soldering the connection. This bolt, passing through registering openings of the socket extension and the deck plate serves as a dependable guide to the assemblymen in properly positioning the soldering lugs with relation to the circuit wiring plan and at the same time performs the additional function of locking the socket against releasing movement.

The above mentioned and other objects are attained by constructing the socket substantially as illustrated in the accompanying drawings but I do not wish to be understood as limiting myself to either the exact form or details of construction shown, as various changes may be made therein without departing from the present invention.

In the drawings:

Fig. 1 is a view in side elevation of my improved socket;

Fig. 2 is a bottom plan view thereof.

Fig. 3 is a top plan view, showing the socket mounted on the deck plate, platform or like support and partially broken away to more clearly show the shaped opening in the deck plate, and

Fig. 4 is a cross sectional view, taken on the line s^4—s^4 of Fig. 3.

Referring now to the drawings, the base or body of the socket, which is formed of rubber or other insulating material, is shown as consisting of a disk 1, provided circumferentially with a depending annular flange 2, forming an interior chamber 3, opening downward.

The flange 2 is thickened at equi-spaced points, as best shown in Fig. 2, to provide seating supports 4, for the spring contacts 5 of the socket, to be hereinafter more fully described.

The enlargements 4 are preferably grooved, as indicated at 6, to receive the metal strips forming the spring contacts 5, which are secured in the grooves by rivets 7.

The spring contact strips extend outwardly from the rivets to form soldering lugs 8, and inwardly from the rivets into the chamber 3, where they are given an approximate S-shaped bend and continued upward at a slight angle, through openings or slots 9, in the disk portion of socket base, as supports for the tube seat member 10, to which the ends of the spring contacts are riveted.

The spring-supported seat member 10, is shown in the form of a disk, having openings 11 therein, corresponding in number, spacing and arrangement with the terminal pins of the tube for which the socket is designed.

As arranged, there is a spring contact 5, for each opening 11 and as a tube is seated, its terminal pins passing through the openings 11 make contact with the upwardly extending slightly inclined portions of the spring strips, above the S-shaped bends thereof.

To ease the spring action without unduly weakening the strength of the springs as supports for the tube, their width may be somewhat reduced throughout the S-shaped bends, as best shown in Fig. 2.

No claim is made herein for the above described construction and arrangement of the tube-seat spring-supported from the base, in the manner shown, as substantially the identical structure is disclosed in the Grebe pending application above referred to.

The first departure from the Grebe socket will be found in substituting the lugs 4, for a full bodied ring, thereby economizing in material, without unduly weakening the structure and adapting the socket body to better serve the purposes of the present invention.

The manner of removably mounting the tube socket on the deck plate constitutes an important feature of the present invention, in that it is effected without the aid of bolts, rivets or soldered joints.

To adapt the socket for quick and convenient mounting on the deck plate, an opening 12 is formed in the deck plate, having enlargements 13, shaped and spaced to correspond with the dimensions and arrangement of the lugs 4 of the socket.

Ordinarily the socket is inserted in the opening 12 from the underside of the deck plate, with the lugs 4 thereof entered in the enlargements 13. While the lugs are practically identical and the same is true of the enlargements of the opening 12, it is necessary when mounting a socket, to insert it in the opening in the deck plate so that the soldering lugs of the spring contacts of the socket come into connecting relation with their proper circuit wires, as determined by the circuit wiring plan of the apparatus. Provision is accordingly made for giving the assemblyman a positive and definite guide, as will be hereinafter described.

Assuming the socket to be properly entered in the opening of the deck plate, as above described, it is secured by being given limited rotary movement, which causes shaped portions 14 of the plate, projecting into the opening, to enter grooves 15, formed in the outer faces of the lugs 4, effectively securing the socket in interlocked relation with the deck plate. If desired, the depth and/or width of each groove may be slightly varied throughout its length, to increase friction, as the interlocking parts are brought into engagement.

The guide to the assemblyman, above referred to, for entering the socket in the opening of the deck plate, so as to bring the several soldering lugs of the spring contacts of the socket into relation for connection with their proper circuit wires, is provided by a ground connection through the socket for one of the filament terminals of the tube.

As is well known, it is common practice to ground one terminal of the tube filament and to save wiring and the work involved in making the connections I extend the length of the proper spring contact of the socket, as indicated at 16, in Fig. 4, and secure the same directly to the adjoining deck plate, preferably by a screw bolt and nut 17.

In order to cause the apertured extension 16 to line up and register with the bolt hole provided in the deck plate, the socket must be properly entered in the opening in the deck plate and when so entered, the various soldering lugs of the spring contacts of the socket will be brought into connecting relation with the proper circuit wires.

In addition to serving as a guide for the assemblyman in positioning the socket, the ground connection described performs another important function, in locking the socket against rotation or releasing movement.

While I have described the socket as being ordinarily entered in the opening from the underside of the deck, it will be apparent that by bending up the soldering lugs of the spring contacts, the socket could be just as readily entered from the upper side thereof, if preferred.

It will be understood that the invention is not limited in its application and may be applied to any tube socket, the particular construction herein described being used for purposes of illustration only and, as above stated, forms no part of the present invention.

Having thus described my invention, what I claim is:

1. The combination of a tube socket, a supporting member shaped to encircle the socket, means effective on rotation of the socket for releasably securing the socket in interlocked relation to the support, and a member engaging one of the terminals of the socket to form a ground connection and secure the socket against releasing movement.

2. The combination of a tube socket hav-

ing its body formed of insulating material, a metallic plate as a support for the socket, the plate having an opening therein to receive the socket, the socket and its support being so shaped that rotation of the socket will secure it in interlocked relation to the support, and a ground connection formed by so securing a socket terminal to the metallic support as to prevent releasing movement of the socket.

3. The combination of a tube socket having its body formed of insulating material and provided with a plurality of suitably spaced radially disposed lugs to which the metallic contact members of the socket are secured, the lugs being grooved on their outer faces, a metal supporting plate provided with an opening to receive the socket, the opening being shaped to correspond substantially to the outline form of the socket, and a ground connection formed by securing one of the metallic contact members of the socket directly to the metal supporting plate.

4. The combination of a multiple-electrode vacuum tube socket provided with requisite circuit terminals, a supporting member having an opening formed therein to receive the socket, means effective on rotation of the socket in the opening for releasably securing the socket in interlocked relation to the support, and a circuit connection with one of the socket terminals arranged to prevent releasing movement of the socket.

5. The combination of a multiple-electrode vacuum tube socket provided with requisite circuit terminals, a supporting member shaped to encircle the socket, means effective on rotation of the socket for releasably securing the socket in interlocked relation to the support, and a circuit connection with one of the socket terminals holding the socket against releasing movement and arranged to definitely position the socket terminals relatively to the support.

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