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ELECTRON TUBE SOCKET WITH REPLACEABLE BY-PASS CAPACITORS

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Fig 1

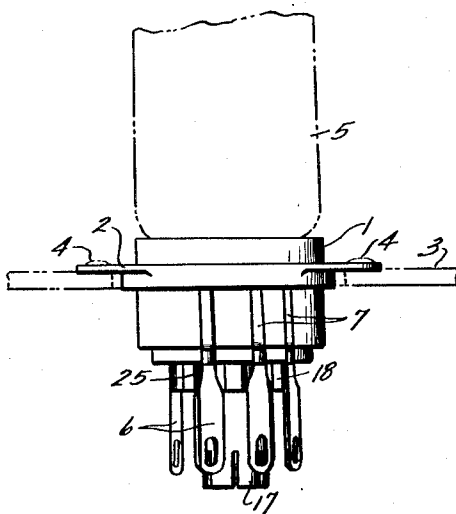


Fig 2

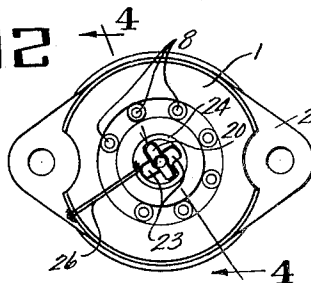


Fig 3

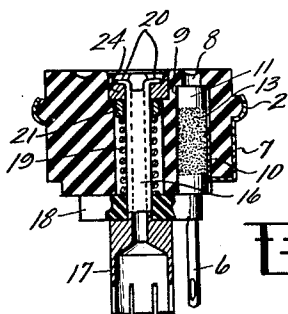
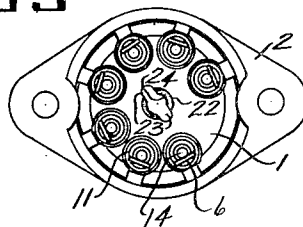


Fig 4

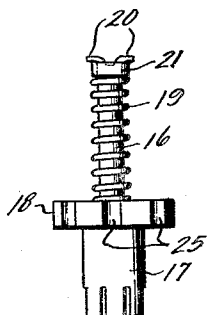


Fig 6

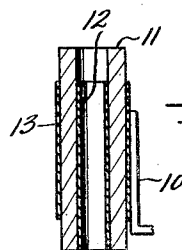
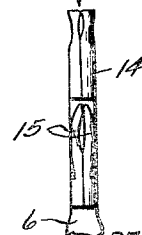


Fig 5



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ELECTRON TUBE SOCKET WITH REPLACE-
ABLE BY-PASS CAPACITORSDavid Satinoff, Utica, N. Y., assignor to the United
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sec. 266)

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The invention described in the following specification and claims may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to electron tube sockets, particularly those intended for use in high-frequency circuits. It is the object of the invention to provide an electron tube socket having by-pass condensers located in the socket body so as to provide minimum lead lengths between the tube electrodes and the condensers. It is another object of the invention to provide a socket of the above type in which the condensers are easily removed and replaced from the bottom of the socket without the use of tools and with minimum disturbance to the wiring attached to the socket. It is a further object of the invention to provide a socket of the above type in which the top is identical to that of a conventional socket with conventional pin hole sizes. This is particularly important in the case of miniature tubes having small closely spaced prongs which are easily bent or misaligned.

A more detailed description of the socket will be given in connection with the accompanying drawings, in which

Fig. 1 is a completely assembled socket in accordance with the invention;

Fig. 2 is a top view of the socket;

Fig. 3 is a view of the bottom or wiring side of the socket;

Fig. 4 is a sectional view of the socket;

Fig. 5 shows the construction of the by-pass condensers and the socket contacts; and

Fig. 6 shows the condenser and contact retaining device.

The socket illustrated in the drawings is for a standard seven pin miniature tube, however, the design is of course not limited to this type which is shown by way of example only. Referring to Fig. 1 the socket has a body 1 of a suitable insulating material. A metallic saddle 2 is attached to the body 1 for mounting the socket on a chassis 3 by means of screws or brads 4. The various contacts of the socket, which contact the pins of tube 5, terminate in lugs 6 to which the necessary wiring may be attached for connecting the tube into a circuit. Elements 7 are metallic grounding strips leading to saddle 2 the purpose of which will be explained later.

The top of the socket is conventional as shown in Fig. 2. The holes 8 are only slightly larger than the base pins of the tube and serve during insertion of the tube to align the pins with respect to the contacts within the socket. As shown in Fig. 4, beneath each of the pin holes 8 and concentric therewith there is located in the

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body of the socket a cylindrical recess 9 of greater diameter than the pin holes. A spring contact finger 10 is located in each of the recesses and is connected to saddle 2 by a grounding strip 7. The contact finger is preferably made of a springy metal and is biased away from the wall of the recess.

The designs of the by-pass condensers and the socket contacts are shown in Fig. 5. The condensers are of the concentric type each consisting of a sleeve 11 of ceramic or other suitable insulating material having inner and outer coatings 12 and 13 of metal such as silver to form two plates of a condenser. The socket contact has a cylindrical body portion 14 part of the lower end of which is extended in flat form to provide a soldering lug 6. The upper part of the body 14 is crimped inwardly near the end and slightly flared outwardly at the end to receive the base pin of the tube and to make good contact therewith. The lower end of body portion 14 is shaped to form a pair of contact fingers 15 for making contact with the inner coating 12 of the by-pass condenser when the contact is in its normal position inside the condenser. When the condenser with contact inserted therein is placed in recess 9 of the socket, as shown in Fig. 4, contact finger 10 connects the outer metallic coating 13 to ground thus forming a capacitive by-pass between the socket contact and ground. By-pass condensers of the type shown in Fig. 5 are placed wherever required in the socket. For those electrodes that do not require by-passing, dummy sleeves are used which may simply be sleeves 11 without the metallic coatings.

The by-pass condensers, or dummy sleeves, and the socket contacts are locked in place in the socket by means of a retaining device shown in Figs. 4 and 6. This device consists of a hollow metallic pin having a shank 16 and a head 17 of larger diameter than the shank. A retaining disc 18 is rotatably fitted to the shank of the pin and urged toward the head by spring 19. The end of the shank is formed into two outwardly extending diametrically opposite ears or bayonets 20. Spring 19 is retained on the shank by these ears and by collar 21 which is slidable on the shank.

The body of the socket is provided with a central cylindrical passageway 22 having two diametrically opposite longitudinal slots 23. These are best seen in Fig. 3, which is a bottom view of the socket with the retaining device removed. The size of the passageway and slots is such as to permit passage of the shank 16 together with ears 20 and spring 19 readily therethrough. The

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upper end of passageway 22 is counterbored to receive a metallic insert 24. The insert also has a cylindrical passageway therethrough which however is large enough to permit passage of shank 16 but not large enough to permit passage of collar 21. The slots 23 on the other hand continue through the insert undiminished in size, as shown in Fig. 3. The end of insert 24 is notched sufficiently to permit ears 20 to be rotated 90° when the pin is fully inserted in the socket with the retaining ring 18 in contact with the bottom of the socket. This action locks the retaining device in the socket. The pressure developed between ears 20 and insert 24 due to spring 19 causes the retaining device to be frictionally held in its locked position against vibration or accidental movement. The retainer may be easily unlocked and removed by rotating the head 17 ninety degrees counterclockwise, as seen from the bottom, which brings ears 20 into alignment with grooves 24 and permits withdrawal of the pin. The diameter of disc 18 is made large enough to substantially cover the ends of the condenser sleeves, or dummy sleeves, thereby retaining the sleeves and the socket contacts in the socket. The contacts are positioned in the sockets with their lugs toward the outside, as shown in Fig. 3, and the retaining disc is provided with notches deep enough to permit passage of lugs 6 without uncovering the ends of the contact bodies 14. As an aid in rotating the pin of the retaining device the head 17 may be castellated as shown in the drawing.

The pin 16-17 also serves as a central shield between the contacts of the socket and between the lugs 6. In order to ground the pin for this purpose a wire 26, lying in a groove in the face of the socket, is used to connect the metallic insert 24 to the saddle 2.

I claim:

1. An electron tube socket comprising a body of insulating material, a plurality of holes in the top of said body corresponding in size and position to the base pins of an electron tube, each of said holes opening into a cylindrical recess coaxial therewith and extending through the bottom of said body, a removable sleeve of insulating material in each of said recesses, a contact element in each of said sleeves, said contact element having means to contact the base pin of an elec-

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tron tube and also having means to contact the inner surfaces of said sleeves, the outer ends of said sleeves and contact elements being flush with the bottom of said socket body, an electrical ground contact in each of said recesses and in contact with the outer surfaces of said sleeves, at least one of said sleeves having its inner and outer surfaces coated with metallic films to form a condenser, and means for retaining said sleeves and said contact elements in said socket body, said means comprising a retaining plate of insulating material, a metallic pin having a shank portion and a head portion, said plate being rotatably mounted on said shank next to said head portion, said shank portion having its end terminated in a pair of diametrically opposite outwardly extending ears, a coil spring in compression positioned around said shank between said ears and said head portion, a centrally located passageway through said socket slightly larger than said spring and having oppositely disposed longitudinal grooves to permit passage of said ears, a metallic insert in the top end of said passageway, a passageway through said insert large enough to permit passage of said shank portion but small enough to prevent passage of said spring, said insert having the grooves of said body passageway continued therethrough and notched sidewise at a point in said insert to permit rotation of said ears through approximately ninety degrees, whereby said pin may be locked in said socket body and thereby fasten said plate to the bottom of said socket body, the size and shape of said plate being such as to overlap at least a portion of the exposed ends of said sleeves and said contact elements.

2. Apparatus as claimed in claim 1 in which means are provided for grounding said metallic insert.

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