

Nov. 11, 1930.

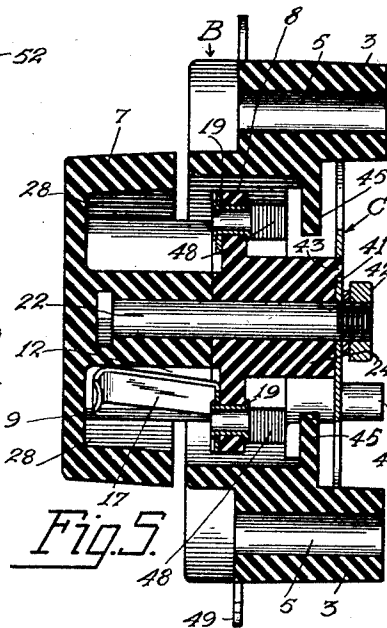
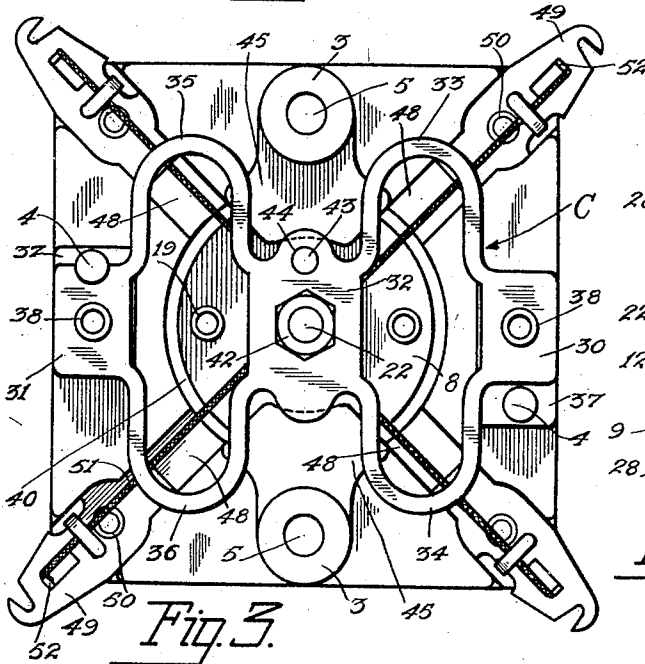
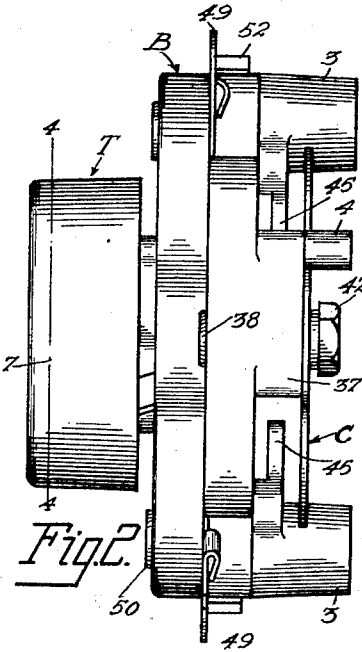
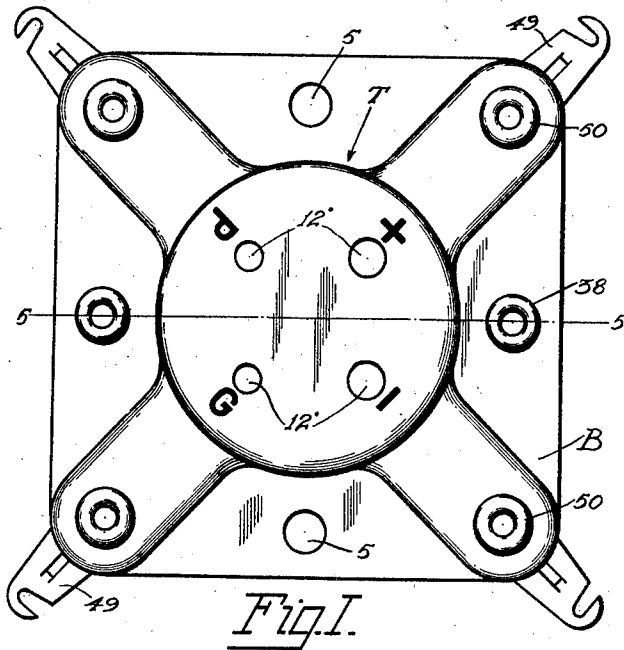
M. B. GROUT

1,781,384

SOCKET

Filed Sept. 27, 1926.

2 Sheets-Sheet 1



Inventor:
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2 Sheets-Sheet 2

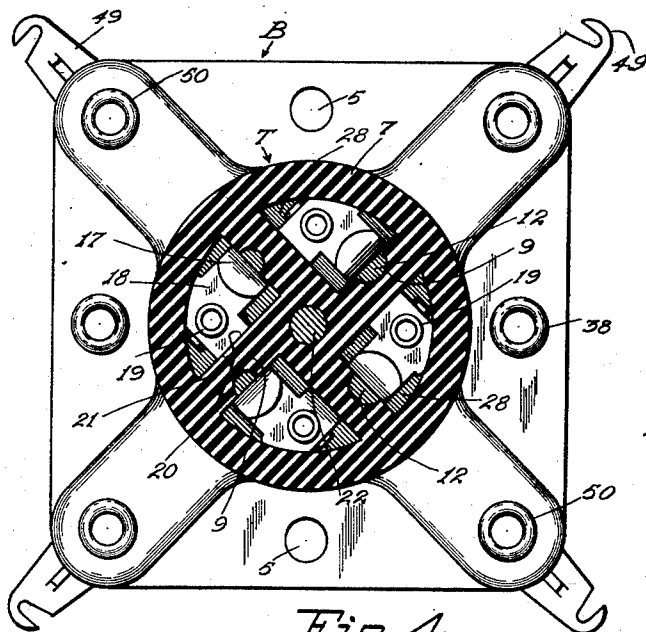


Fig. 4.

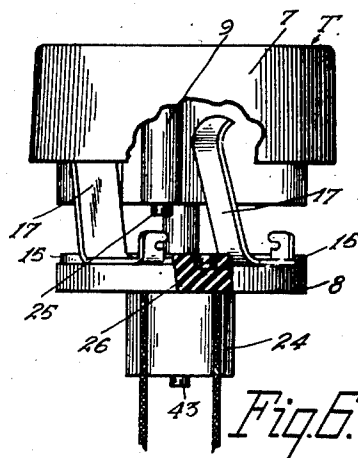


Fig. 6.

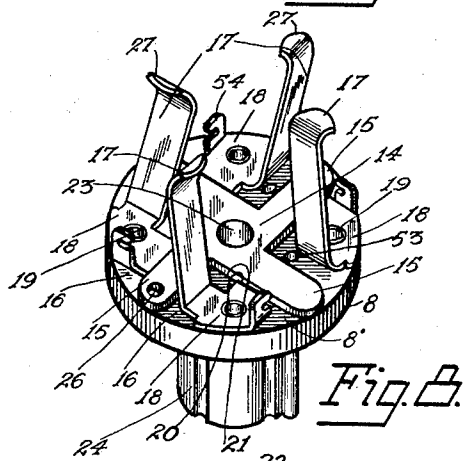


Fig. 5.

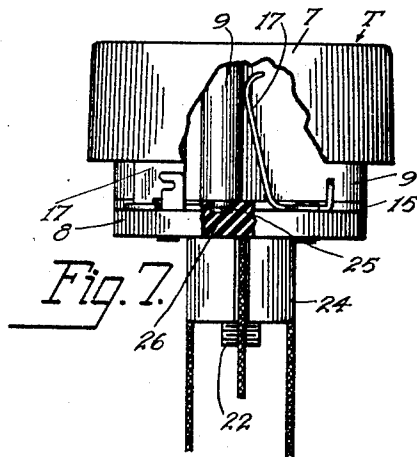


Fig. 7.

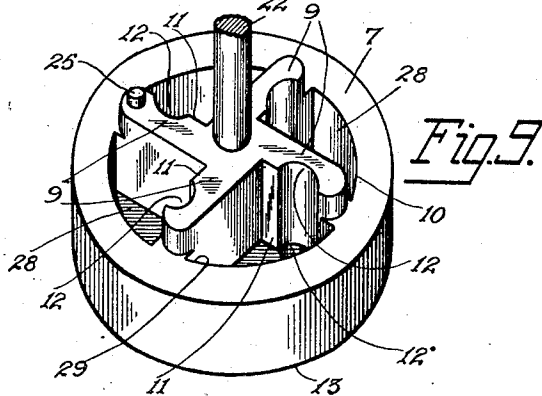


Fig. 9.

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UNITED STATES PATENT OFFICE

MARTIN B. GROUT, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

SOCKET

Application filed September 27, 1926. Serial No. 137,911.

My invention relates to sockets and more particularly to sockets adapted to receive and support audion tubes or the like, and an object of my invention is the provision of a socket of the above type for resiliently supporting an audion tube in order that vibrations and shocks will be absorbed without materially affecting the elements of the audion tube.

A feature of my invention is the provision of a flat resilient member by means of which the tube supporting member of the socket is resiliently supported from the base to permit the supporting member to yieldingly move in all directions.

Another feature of my invention is the provision of a novel tube supporting member which is secured to the resilient member for yieldingly supporting the same.

Still another feature of my invention is the provision of a novel arrangement in which flexible conducting members carry the external circuits to the contacts of the tube supporting member independent of the resilient member.

The above features of my invention as well as others not specifically pointed out will be more fully described in the ensuing specification.

For a more complete understanding of my invention reference may be had to the accompanying drawings in which like reference characters in the several views denote like parts and in which:

Fig. 1 is a plan view of the socket of my invention,

Fig. 2 is a side elevation of the socket,

Fig. 3 is a bottom view of the socket.

Fig. 4 is a sectional view along the line 4—4 of Fig. 2,

Fig. 5 is a sectional view along the line 5—5 of Fig. 1,

Fig. 6 is a view of the contact carrying member and its associated member for receiving the contact terminal pins or prongs of an audion tube in a partially assembled position,

Fig. 7 is a view similar to Fig. 6 but showing the contact carrying member and its associated member for receiving the contact

terminal pins or prongs of an audion tube in assembled position,

Fig. 8 is a perspective view of the contact carrying disk, and

Fig. 9 is a perspective view of the member for receiving the contact terminal pins or prongs of an audion tube.

Referring now more in detail to the drawings, the socket of my invention as illustrated comprises a base B of suitable moulded insulating material, having the supporting lugs or legs 3 and 4 on the bottom side thereof, the legs 3 being provided with orifices 5 for the reception of screws by means of which the socket base and its supported parts may be secured to a mounting base or sub-panel.

The tube socket supporting member T comprises an inverted cup shaped member 7 and a contact carrying disk member 8 which when assembled as clearly illustrated in Figs. 6 and 7 form the means for supporting an audion tube. The cup shaped member 7 is provided with four integrally formed downwardly extending ribs 9 positioned at right angles to each other, the said ribs 9 extending below the rim 10 of the cup shaped member 7 a short distance. The faces 11 of the ribs 9 are provided with semi-circular grooves 12 which are aligned with orifices 12' in the bottom 13 of the inverted cup shaped member 7 for purposes as will presently be described.

The face 8' of the disk 8 is provided with an embossed or raised portion 14 which conforms with the contour of the ribs 9 integrally formed with the cup shaped member 7. Adjacent extending ribs 15 of the embossed portion 14 on the face 8' of the disk 8, form substantially triangular shaped depressions 16 in which the substantially triangular shaped bases 18 of the L shaped spring contacts 17 are positioned and rivets 19 which pass through suitable orifices in the disk 8 and bases 18 of spring contacts 17 secure the said springs 17 to the base 8. The edges 20 of the bases 18 of the springs 17 engage the edges 21 of the extending ribs 15 of the embossed portion 14 of the disk 8 and prevent the springs 17 from turning about the rivets 19 which secure them to the disk.

The inverted cup member 7 is provided

with a depending threaded stud 22 which is secured thereto during the moulding of the same, and a central orifice 23 in the disk 8 and its depending cylindrical portion 24 is adapted to receive the threaded stud 22. One of the ribs 9 of the cup member 7 is provided with a lug 25 which is adapted to register with an orifice 26 in one of the embossed ribs 15 on the disk 8. To associate the disk 8 and its supported spring contacts 17 with the cup member 7 the disk is positioned on the stud 22 so as to place the lug 25 on the rib 9 of the cup member 7 substantially in alignment with the orifice 26 in the embossed rib 15 of the disk 8. With the disk 8 thus positioned the same is now moved along the stud 22 to permit the free ends 27 of the springs 17 secured to the disk 8 to enter the substantially triangular recesses 28 in the cup member 7 formed by the ribs 9 integrally formed therewith and the wall 29 of the same. The free ends 27 of the springs 17 when positioned in the recesses 28 engage the faces 11 of the ribs 9 in the cup member 7 and also span the semi-circular grooves 12 therein as is clearly illustrated in Fig. 6. When the disk 8 and its supported springs 17 are in this position relative to the ribs 9 in the cup member 7 the disk 8 is turned in a clockwise direction on the stud 22 in relation to Fig. 6 to place the lug 25 on the rib 9 of the cup member 7 in alignment with the orifice 26 in the embossed rib 15 on the disk 8. The movement of the disk 8 relative to the cup member 7 places the free ends 27 of the springs 17 under tension and the further movement of the disk 8 along the stud 22 now permits the lug 25 to enter the orifice 26 in the disk 8 as clearly illustrated in Fig. 7. The tension of the springs 17 is such as to cause the free ends 27 thereof to firmly engage the respective faces 11 of the ribs 9 thus preventing the disk 8 from moving longitudinally along the stud 22 due to the frictional engagement of the free ends 27 of the springs 17 with the faces 11 of the ribs 9 to hold the disk 8 and its supported springs 17 in association with the cup member 7 until this unit member T is secured to its spring supporting member as will now be described. Attached to the bottom face of the base B is a flat resilient cushion member C made of suitable thin spring metal, comprising substantially rectangular end portions 30 and 31, and an intermediate oblong portion 32, the respective end portions 30 and 31 being connected to the intermediate portion 32 by means of integrally formed loop members 33, 34 and 35, 36. The base B is provided with integrally formed depending lugs 37 and suitable rivets 38 passing through orifices in the base B and lugs 37 and the respective end portions 30 and 31 of the member C secure the member C on the bottom of the base B. The base B is provided with a central orifice 40 which is adapted to loosely receive the disk portion 8 of the tube supporting

member T and with this member T thus positioned in the central orifice 40 of the base B the depending cylindrical portion 24 of the disk 8 engages the intermediate portion 32 of the member C. The protruding portion of the threaded stud 22 projects through a suitable orifice 41 in the intermediate portion 32 of the member C and a nut 42 having threaded engagement with the end of the threaded stud 22 secures the tube supporting member T to the resilient member C. The nut 42 in addition to securing the member T as a whole to the resilient member C also secures the disk 8 and cup member 7 together. The cylindrical depending portion 24 of the disk 8 is also provided with a lug 43 which is adapted to enter a suitable orifice 44 in the intermediate portion 32 of the resilient member C to prevent the member T from rotating in the orifice 40.

The openings 12' in the cup member 7 of the tube supporting member T are adapted to receive the contact terminal pins projecting from the base of an audion tube. As the tube is inserted into the socket the pins of the same will slide in the grooves 12 in the faces 11 of the ribs 9 and flex the free ends 27 of the springs 17 and make a wiping contact with terminal pins and act not only to complete the electrical circuit of the tube, but also snugly hold the tube in position. As the tube is inserted to force the pins of the same between the ends 27 of the springs 17 downward pressure is applied thereto causing the resilient member C to be flexed. This downward movement is limited as the diameter of the cup member 7 of the supporting member T is slightly larger than the central orifice 40 in the base B which permits the rim 10 of the cup member 7 to engage the top face of the base B to prevent excess flexure of the resilient member C as the tube is inserted. A pair of projecting ears 45 integrally formed with the base B lie beneath the intermediate portion 32 of the resilient member C and when a tube is removed from the socket member T the pull exerted on the tube to remove the same will cause the resilient member C to flex but this flexure is limited as the intermediate portion 32 of the resilient member C will engage the projecting ears 45 and thus prevent excess flexure of the resilient member C as the tube is withdrawn.

As the tube supporting member T is secured to the resilient member C as before described this resilient member C effectively cushions the audion tube supported in the member T against a blow from any direction. The loop members 33, 34 and 35, 36 which connect the respective end portions 30 and 31 and are secured to the base B at the intermediate portion 32 produce this cushioning effect. The loop members 33, 34 and 35, 36 thus permit the tube supporting member T to yield slightly toward or away from

the base B or it may oscillate in any direction.

The base B is provided on the underside thereof with four grooves or channels 48. At the outer extremity of each of these channels 48 are secured terminal members 49 which are secured to the base B by means of rivets 50. Flexible conductors 51 lying within the channels 48 join the contact springs 17 of the tube supporting member T with the terminals 49. One end of each flexible conductor 51 is soldered to a tab 52 integrally formed with the terminals 49, the other ends of the conductors 51 pass through suitable orifices 53 in the disk 8 and then are soldered to the tabs 54 integrally formed with the springs 17. The terminal members 49 are adapted to receive the external circuit connections and through the medium of the flexible conductors 51 the circuit is extended to the spring terminals 17 of the tube supporting member T. With a construction of the type just described the socket is cushioned and at the same time yieldingly supported for movement in all directions by a single resilient supporting member, and cheap and satisfactory means are provided independent of the resilient supporting means for extending the external electrical circuits to the pins of the tube through the medium of the springs 17 of the member T.

While I have illustrated and described a preferred embodiment of my invention it is to be understood that I do not wish to be limited to the exact structure as shown but aim to cover all such changes 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 base, means for holding an audion tube, a resilient member secured at its respective ends to said base, comprising double loop portions connecting said respective ends, means for securing the said holding means to said resilient member intermediate of the ends of said resilient means whereby said holding means is resiliently supported from said base.

2. A device of the character described comprising a base, a central orifice in said base and means for holding an audion tube loosely in said orifice, a resilient member secured at its respective ends to said base comprising double loop portions connecting said ends to an intermediate portion, means for securing said holding means to said resilient member at said intermediate portion whereby said holding means is resiliently supported from said base in said central orifice.

3. A device of the character described comprising a base, a tube supporting member, a resilient member comprising double loop

portions connecting the ends of said resilient member and secured at said ends to said base and means for securing said tube supporting member to said resilient member intermediate of the ends of said resilient member, whereby said tube supporting member is resiliently supported from said base, and means on said base and said resilient member for limiting the movement of said tube supporting member from said base in one direction.

4. A device of the character described comprising a base, a tube supporting member, a resilient member secured to said base and means for securing said tube supporting member to said resilient member intermediate of the ends of said resilient member whereby said supporting member is resiliently supported from said base, means on said base and said resilient member for limiting the movement of said supporting member from said base in one direction, and means on said supporting member for limiting the movement of the same in the opposite direction.

5. A device of the character described including a socket, a base for said socket having a central orifice extending therethrough, resilient means comprising double loop portions connecting the ends of said resilient means and secured at said ends to said base, means for securing said socket to said resilient means intermediate of the ends of said resilient means for supporting said socket from said base loosely in said central orifice, contact springs within said socket for engaging the terminal pins of an audion tube associated therewith, said resilient means yieldingly supporting said socket with respect to said base.

6. A device of the character described including a socket for receiving an audion tube, a base for said socket, a flat resilient member comprising end portions secured to said base and double loop portions connecting said respective ends, an intermediate portion for said member, means for securing said socket to the intermediate portion of said member, said loop portions of said member yieldingly supporting said socket with respect to said base but excluded from the electrical circuits of said audion tube.

7. A device of the character described including a socket for receiving an audion tube, a mounting member for said socket, a flat metal member comprising end portions secured to said mounting member and double loop portions connecting said respective ends and an intermediate portion of said metal member, means for securing said socket to said metal member, said socket resting loosely in a central orifice in said mounting member, said loop portions of said member yieldingly supporting said socket with respect to said mounting member.

8. A device of the character described including a socket for receiving an audion tube, a flat metal frame comprising end portions for securing said frame to said base, double loop portions forming a portion of said frame connecting said respective end portions and an intermediate portion of said frame, means for securing said socket to said frame in a central orifice of said base, said loop portions of said frame yieldingly supporting said socket, with respect to said base in said central orifice.
9. A device of the character described comprising a base, a central orifice in said base and means for holding an audion tube loosely in said orifice, a resilient member comprising double loop portions connecting the ends of said member, said member secured at its respective ends to said base, means for securing said holding means to said resilient member intermediate of the ends of said resilient member whereby said holding means is resiliently supported from said base in said central orifice, and electrical conductors extending from contact on said holding means to contacts on said base.
10. A device of the character described including a socket, a base for said socket having a central orifice extending therethrough, resilient means secured to said base, said resilient means comprising double loop portions connecting the ends of said means to an intermediate portion, means for securing said socket to said resilient means at said intermediate portion for supporting said socket from said base loosely in said central orifice, contact springs within said socket for engaging the terminal pins of an audion tube associated therewith, said resilient means yieldingly supporting said socket with respect to said base, non-supporting electrical conductors extending from said contact springs to contacts on said base.
11. A device of the character described including a mounting member having an orifice, a socket member extending into said orifice, spring contact members for said socket member adapted to slidingly engage the contact pins of an audion tube to make electrical engagement therewith, a spring member excluded from the circuits of said audion tube and comprising a pair of end portions attached to said mounting member and a flat portion connecting said respective ends to an intermediate portion connected to said socket member for yieldingly supporting said socket member, terminal contacts attached to said mounting member, and electrical conductors extending from said spring contact members to said terminal contacts, and cooperating means for said mounting member and said socket member
- for limiting the movement of said socket member.
- Signed by me at Chicago, in the county of Cook and State of Illinois, this 24th day of September 1926.
- MARTIN B. GROUT.