July 14, 1925. 1,545,639

S. COHEN

VACUUM TUBE MOUNTING

Original Filed July 11, 1922 2 Sheets-Sheet 1

Fig. 1.

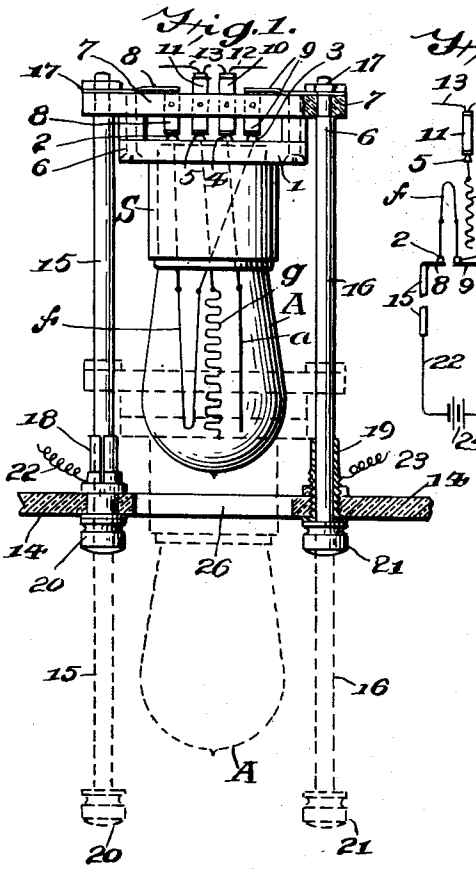


Fig. 2.

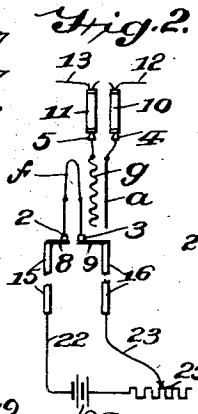


Fig. 4.

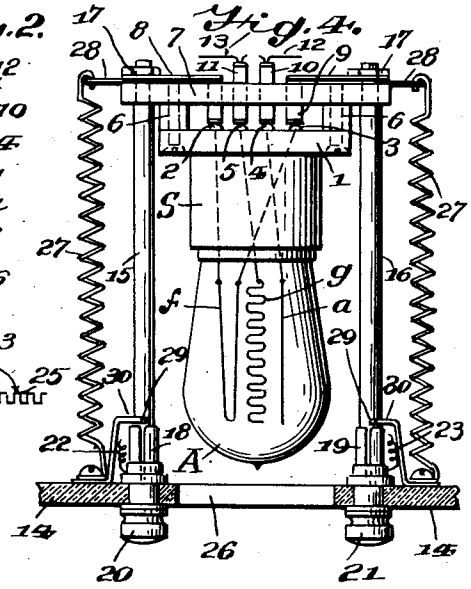


Fig. 5.

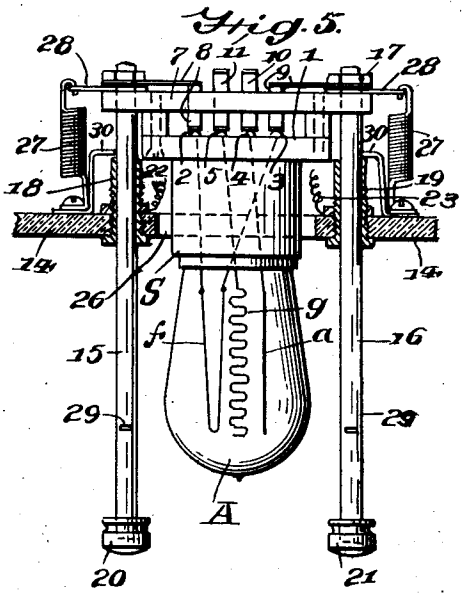
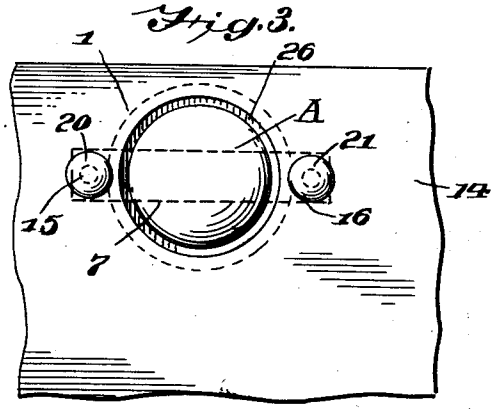


Fig. 3.



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Fig. 6.

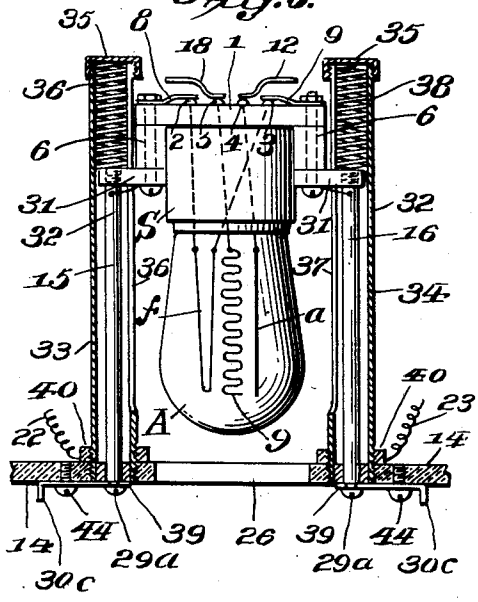


Fig. 7.

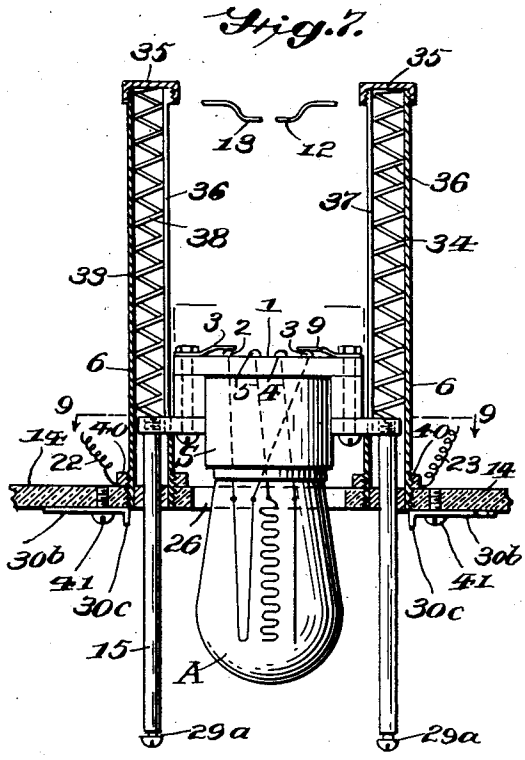


Fig. 8.

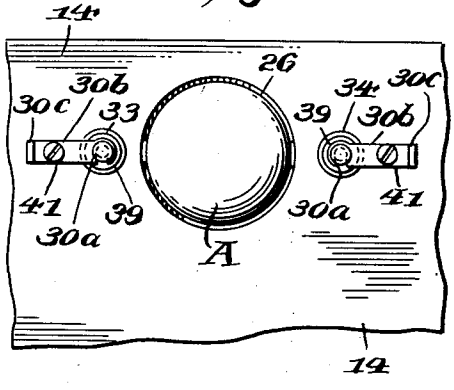
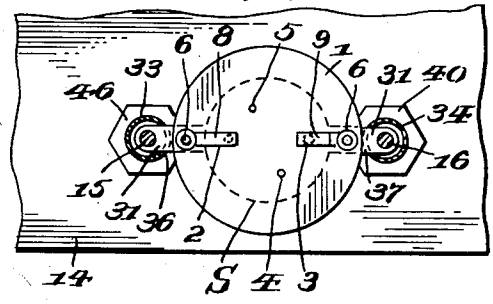


Fig. 9.



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UNITED STATES PATENT OFFICE.

SAMUEL COHEN, OF BROOKLYN, NEW YORK, ASSIGNOR TO GRACE A. BARRON, OF NEW YORK, N. Y.

VACUUM-TUBE MOUNTING.

Substitute for application Serial No. 574,135, filed July 11, 1922. This application filed December 24, 1924. Serial No. 757,869.

To all whom it may concern:

Be it known that I, SAMUEL COHEN, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented a certain new and useful Improvement in a Vacuum-Tube Mounting, of which the following is a specification.

My invention relates to mountings for vacuum tubes, such as audions or similar or equivalent thermionic devices utilizable in systems of radio communication and in other relations.

This application is a substitution for my application Serial No. 574,135, filed July 11, 1922.

In accordance with my invention, the receptacle or socket for the audion is supported upon structure by which it is movable to different positions, for the purpose, for example, of moving the audion bulb from a position in the rear of a panel or switchboard or casing wall, through the same to a position adjacent the operator, whereby the bulb may be removed from or inserted into the socket or receptacle and then returned to normal concealed or protected position.

My invention resides in structure of the character hereinafter described and claimed.

For an illustration of some of the many forms my invention may take, reference is to be had to the accompanying drawings, in which:—

Figure 1 is a plan view partly in cross section, of structure embodying my invention; Fig. 2 is a diagrammatic view illustrating circuit arrangements utilizing my structure; Fig. 3 is a front elevational view of a portion of the structure shown in Fig. 1; Figs. 4 and 5 are plan views partly in section, of a modified structure showing the audion bulb in different positions; Figs. 6 and 7 are plan views partially in section, of a further modification in different positions; Fig. 8 is a front elevational view of the structure shown in Fig. 6; and Fig. 9 is a sectional end elevation on the line 9—9 of Fig. 7.

Referring to the drawings, S is a socket or receptacle such as a metallic sleeve secured upon the member 1. An audion or similar bulb A is held in the socket or sleeve S, as by a bayonet joint, as well understood in the art. The base of the audion carries the contacts or electrodes 2 and 3, connected, respectively with the terminals of the cathode or filament f within the audion bulb. The anode or plate a connects with a similar terminal 4 upon the base of the audion, and a terminal 5 upon the base of the audion communicates with the grid or control electrode g within the audion bulb and disposed between the cathode and anode. The member 1 has an aperture registering with the socket S whereby the audion base may extend therethrough and present the terminals 2, 3, 4 and 5 for engagement with contacts, as well understood in the art. The member 1 is secured, as by screws 6, to the block or base 7, preferably of insulating material, to which are secured, or upon which are suitably supported, the contact springs 8 and 9 adapted to be engaged, respectively, by the filament electrodes 2 and 3. Supported on or secured to the member 7 are the contact springs 10 and 11, engaged, respectively by the anode and grid terminals or electrodes 4 and 5. The contacts 10 and 11 are yielding or resilient not only at their lower ends for engagement with the electrodes 4 and 5, but also are preferably yielding or resilient at their upper ends for engagement with either rigid or resilient stationary contacts 12 and 13 with which may connect conductors for connecting the anode and grid in any suitable way to the circuits associated with the audion A. Or in lieu of employment of the stationary contacts 12 and 13, the aforesaid conductors may be coiled or flexible and permanently connected to the contacts 10 and 11 and to retain contact with them as the member 7 is moved, as hereinafter described.

The member 14, generally of insulating material, may be a panel board, switchboard, or wall of a box or casing. The audion A when in normal position, indicated in full lines in Fig. 1, is back of or to one side of

the wall or member 14, the support therefor being the metallic rods 15 and 16, upon which is secured the member 7 by the nuts or equivalent means 17. The aforesaid contracts 8 and 9 have lateral extensions terminating beneath the nuts 17 or otherwise brought into electrical communication, respectively, with the rods 15 and 16, whereby the rods 15 and 16 remain in electrical communication, respectively, with the terminals of the filament *f*. Carried by the member 14 are the split sleeve members 18 and 19, through which are slidable with more or less friction the rods 15 and 16, respectively, which are provided on their outer ends with the knobs or handles 20 and 21 respectively. Connected with the metallic sleeves or members 18 and 19 are the conductors 22 and 23 respectively, which, as indicated in Fig. 2 are in circuit with the filament battery 24 and rheostat 25, whereby whatever the position of the audion A and its supporting structure including the rods 15 and 16, the filament *f* is in circuit with the battery 24 and rheostat 25.

With the structure in the position indicated in Fig. 1, the filament is in circuit with the battery and rheostat as aforesaid and the grid and anode are in communication with the contacts 12 and 13, or with flexible conductors connected respectively, with the spring contacts 10 and 11.

Should the operator desire access to the audion A, he pulls forward upon the knobs 20, 21, thereby sliding the rods 15 and 16 through sleeves 18 and 19, bringing the audion A to the dotted line position indicated in Fig. 1, the member 14 being provided with an aperture 26 to allow free passage of the audion bulb. When in dotted line position, the audion bulb may be inspected or removed, or an audion may be introduced into the socket S, in which case the audion electrodes will come into proper register with the contacts carried by the member 7. Thereafter, upon pushing the rods 15 and 16 inwardly, the structure will again assume the position indicated in full lines in Fig. 1 whereby the audion A is within the box or casing or behind the wall or panel or switchboard 14, in protected or concealed position.

Referring to Figs. 4 and 5 the arrangement is similar to that described in connection with Fig. 1. There are provided, however, one or more springs 27, one end of each of which is attached to any suitable fixed member, as for example, the member 14, and the other end of each of which is connected to a lug or projection 28 secured to the member 7, the springs 27 being under tension with the parts in the position shown in Fig. 4. Each of the rods 15 and 16 are provided with a cam slot 29 in which engages a latch or locking member 30 restraining the rods 15 and 16 in the position indicated in Fig. 4 notwithstanding the tension of the springs 27.

When it is desired to move the audion A through the aperture 26 in the member 14, the operator rotates the knobs 20 and 21, thereby rotating the rods 15 and 16 to withdraw the locking grooves or slots 29 from coaction with the locking members or latches 30, whereupon the springs 27 will contact and move the rods 15 and 16 and the audion A carried thereby forward to the position indicated in Fig. 5, in which the audion has been passed through the aperture 26 and is on the operator's side of the member or wall 14. To restore the audion to the position shown in Fig. 4, the operator pushes inwardly upon the knobs 20 and 21, thereby again extending the springs 27 until the position indicated in Fig. 4 is reached, when the operator again turns the rods 15 and 16 to cause engagement of the latching members 30 in the locking slots or grooves 29.

Referring to Fig. 6, the disk or member 1 carrying the socket S is secured to the member or members 31 which may be of insulating material when a single member 31 is employed or which may be of conducting material, as metal, when two members 31 are employed which do not electrically connect with each other. The screws 6 which attach the member or members 31 to the member 1 also secure and connect with the contact springs 8 and 9, whereby those contact springs, and therefore the terminals of the filament *f*, are in electrical communication with the rods 15 and 16 when two members 31 of metal are employed. Or when the members 31 are of insulating material, either separate or joined to each other, conductors 32 may be employed to connect the screws 6, and therefore the springs 8 and 9, with the rods 15 and 16. The rods 15 and 16 are disposed within the tubular housings 33 and 34 respectively, closed at their remote ends by the caps or closure members 35. The tube 33 is longitudinally slotted at 36 to allow longitudinal movement of the member 31 as the rod 15 is moved forwardly. Similarly the tube 34 is slotted at 37 for like purposes. Between the caps 35 and the members 31 are disposed within the tubes 33 and 34 the springs 38 under compression when the parts are in the position indicated in Fig. 6.

At their forward ends the tubes 33 and 34 are provided with the metallic bushings 39 in electrical communication with the tubes 33 and 34, and through these bushings, and electrically contacting therewith are movable the rods 15 and 16, whereby the terminals of the filament *f* are in effect in electrical communication with the nuts or equivalent 40, threaded upon the exterior of

the tubes 33 and 34 and serving to connect with and bind the aforesaid conductors 22 and 23, the tubes themselves being threaded or otherwise secured in or to the member 14. At its outer end, each of the rods 15 and 16, is provided with a circumferential groove or slot 29^a, in which engages the hooked end 30^a of locking members 30^b, pivoted upon the pivot screws or pins 41 carried by the member 14. The ends of the members 30^b opposite the hooks 30^a are provided with the lugs or handles 30^c.

When the operator desires the bulb A to move forwardly through the aperture 26, he rotates the members 30^b upon their pivots 41, preferably simultaneously pushing in upon the ends of the rods 15 and 16 to take the pressure of the springs 38; the hook ends 30^a of the member 30^b are accordingly removed from the locking grooves 29^a and upon release of the pressure upon the ends of rods 33 and 34 the springs 38 will expand and move the audion A through the aperture 36 to the position indicated in Fig. 7. The structure may be restored to the position indicated in Fig. 6 by pushing in upon the rods 15 and 16 and returning the locking members 30^b to locking position indicated in Fig. 6.

For brevity in the appended claims the term "audion" is employed in a generic sense to include thermionic devices of the character described.

What I claim is:—

1. In an audion mounting, an audion receptacle, a support therefor, movable structure carrying said support, a member on which said movable structure is supported and movable, means tending to move said movable structure, and means for restraining said movable structure against movement, said member having an aperture through which an audion disposed in said receptacle is movable upon movement of said movable structure.

2. In an audion mounting, an audion receptacle, a support therefor, movable structure carrying said support, a member on which said movable structure is supported and movable, a spring for moving said movable structure, and means for restraining said movable structure against movement by said spring, said member having an aperture through which an audion disposed in said receptacle is movable upon movement of said movable structure.

3. In an audion mounting, the combination with an audion receptacle of a support therefor, rods to which said support is secured, and a member supporting said rods and having apertures through which said rods are slidable.

4. In an audion mounting, the combination with an audion receptacle, of a support therefor, rods to which said support is secured, and a member supporting said rods and having apertures through which said rods are slidable, said member having an aperture through which an audion disposed in said receptacle is adapted to be moved upon movement of said rods.

5. In an audion mounting, the combination with an audion receptacle of a support therefor, contacts carried by said support and adapted to engage electrodes of an audion when disposed in said receptacle, a movable conducting member carrying said support, one of said contacts connecting with said conducting member, a stationary conducting member upon which said conducting member is movable and a circuit connection to said stationary member.

6. In an audion mounting, the combination with an audion receptacle of a support therefor, contacts carried by said support and adapted to engage electrodes upon an audion, a pair of movable conducting members to which said support is secured, stationary conducting members upon which said conducting members are movable, electrical circuit connections to said last named conducting members, and connections between a pair of said contacts and said first named conducting members, said pair of contacts adapted to engage the audion electrodes connecting with the audion filament.

7. In an audion mounting, the combination with a member having an aperture through which an audion may be passed, a pair of conducting members carried by said member on opposite sides of said aperture, a pair of conducting rods movable through said conducting members, a support carried by said rods, an audion receptacle carried by said support and a pair of contacts connecting with said rods and adapted to engage the filament electrodes of an audion received in said receptacle.

8. In an audion mounting, the combination with a member having an aperture through which an audion may be moved, of a pair of rods disposed on opposite sides of said aperture and slidable through said member, a support carried by said rods and an audion receptacle carried by said support.

9. In an audion mounting, the combination with an audion receptacle of a base member upon which said receptacle is mounted and from which it is spaced, contacts carried by said base and adapted to engage the electrodes of an audion received in said receptacle, the electrode-engaging portions of said contacts being disposed between said base and said receptacle, movable structure to which said base is secured and a member upon which said movable structure is carried and movable.

10. In an audion mounting, the combination with an audion receptacle of a base

member upon which said receptacle is mounted and from which it is spaced, contacts carried by said base and adapted to engage the electrodes of an audion received in said receptacle, the electrode-engaging portions of said contacts being disposed between said base and said receptacle, movable structure to which said base is secured, and a member upon which said movable structure is carried and movable, said member having an aperture through which an audion in said receptacle is moved upon movement of said movable structure.

SAMUEL COHEN.