Nov. 1, 1932. H. L. STRONGSON 1,885,782

SHIELDED TUBE AND SOCKET

Filed June 17, 1926 2 Sheets-Sheet 1

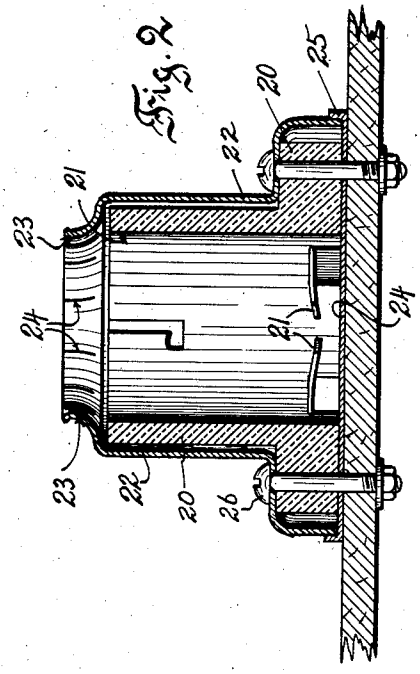


Fig. 2

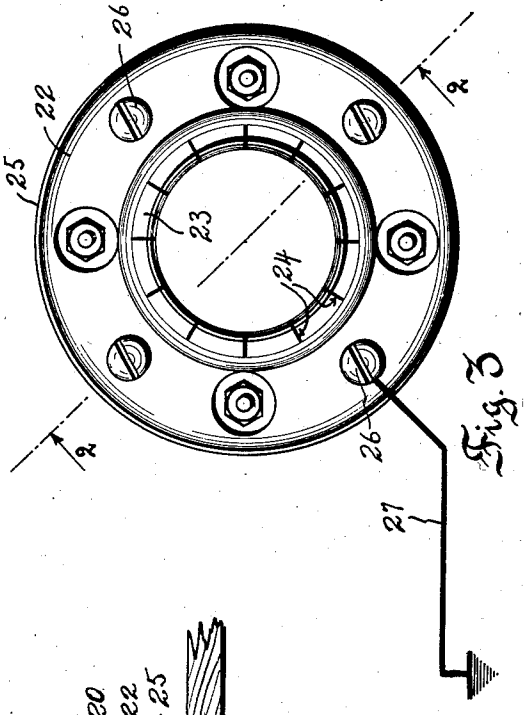


Fig. 3

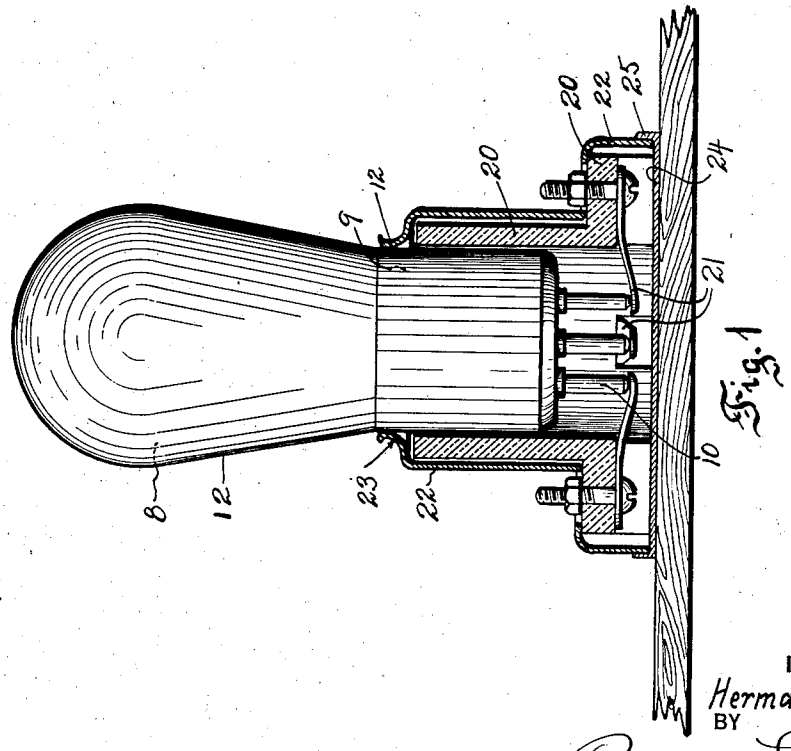


Fig. 1

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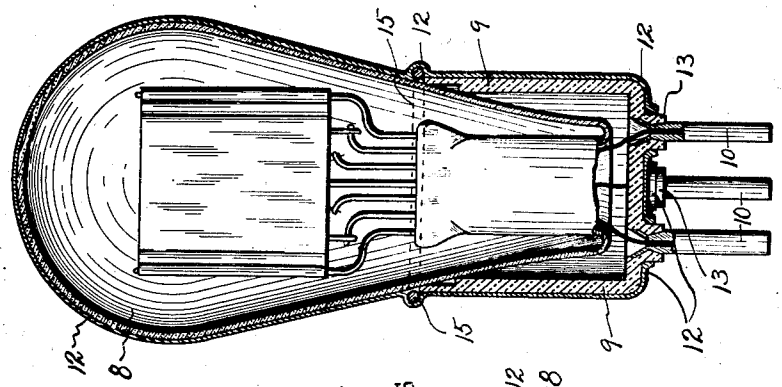


Fig. 6

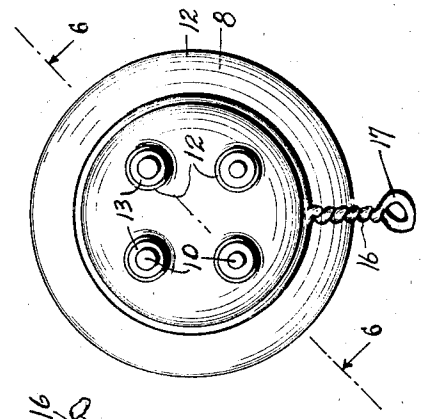


Fig. 5

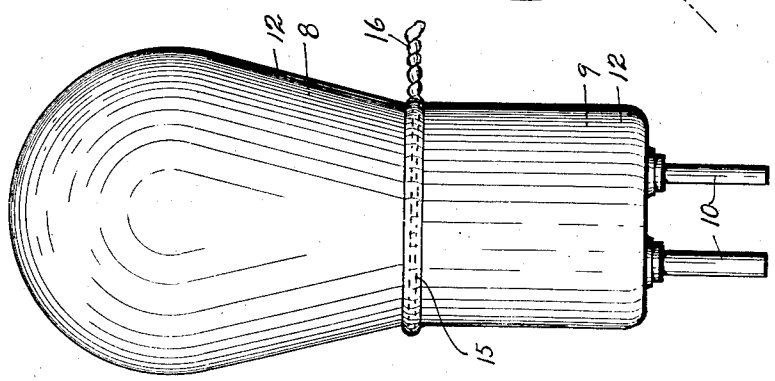


Fig. 4

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UNITED STATES PATENT OFFICE

HERMAN L. STRONGSON, OF NEW YORK, N. Y.

SHIELDED TUBE AND SOCKET

Application filed June 17, 1926. Serial No. 116,533.

This invention relates to improvements in vacuum tubes, and relates to improvements in sockets therefor. More particularly, the invention relates to a shielded vacuum tube and shielded socket.

An object of the invention is to shield electrical, radio, wireless, and receiving apparatus, as vacuum tubes, from stray radio signals so as to permit normal operation thereof by confining it to the radio signals intended therefor which is accomplished by shielding the tube from extraneous radio signals. In this way my improved tube is confined to reception of and operation on radio signals coming from the antenna only so that outside, extraneous and unintended electrical signals are not permitted to pass into the tube, but are collected by the tube and socket shield and grounded.

A further object of the invention is to produce a shielded socket and to produce a combination shielded socket and tube which readily fit together and establish a closed shield over both parts.

The accompanying drawings illustrate an example of the invention wherein,

Figure 1 shows an assembly view of a shielded socket and a shielded tube, and the two shields establish connection with each other when the tube is plugged into the socket.

Figures 2 and 3 show views of the socket with the tube removed, Figure 2 being a longitudinal section of the socket mounted on a panel and Figure 3 a plan view.

Figure 4 shows an elevation of the improved shielded tube; and Figure 5 shows a bottom plan view thereof.

Figure 6 shows a longitudinal section of the tube as taken on the line 6—6 of Figure 5, which illustrates a thin metallic envelope plated on the tube bulb and base.

Referring first to the new tube itself, it is an ordinary tube consisting of a glass evacuated bulb 8 mounted in a base 9 having contacts such as prongs or pins 10. My improvement consists in plating the glass bulb 8 and tube base 9 with a metallic coating 12. Any suitable metallic coating may be applied as for example copper, bronze, silver, tin or other suitable material which forms a good conductor of electricity and particularly which forms a good conductor of stray radio signals. The shield 12 envelops the glass bulb 8 and base 9 and extends down to the contacts 10 but does not touch them.

The metallic envelope or coating 12 is insulated from the contacts 10 in any suitable way. An exemplary insulating means is shown at 13 which is a boss formed integral on the base 9 projecting through the coated metallic shielding envelope 12. The bosses 13 produce a thick tube base 9 at the point where the pin 10 projects through the base and so the shielding metallic envelope 12 is plated down to and around the bosses 13 without short circuiting the contacts 10.

A suitable binding post or current conducting means is carried on the tube and connected with the shield so as to ground it. Any suitable electrical connection may be employed, as for example, a wire 15 may be fastened in some appropriate manner to the tube. The wire or strip 15 may encircle the glass tube 8 and may rest against the upper edge of the tube base 9 in order to hold the ground wire 15 in place and take up minimum space. The ground wire or other suitable binding post means or terminal means 15 may be mounted on the tube before plating so that the plating process envelops or embeds the ground connection 15 as an integral part of the shielding material.

An end of the ground wire 15 is brought out in the form of a terminal 16 and if desired an eye or binding post 17 may be made on the end of the wire 16. The wire 16 is flexible and may be bent back against the side of the tube so as to require little space. Ground wire lead connections, not shown, may be attached to the wire strand or pigtail 16, or are connected to the binding post eye 17. By grounding the wire 15, it follows that the inside delicate tube elements are completely shielded from outside radio signal interferences so as to cause the tube to operate normally on signals from the antenna only. As rapidly as stray radio signals reach the metallic shield they are conducted off through the grounding wire 15.

Referring now to the shielded socket, there

is shown a socket base 20 of any suitable form with contact means 21 adapted to be engaged by the pins 10 or any other contacts on vacuum tubes. The socket base 20 usually includes suitable receiving and holding means for vacuum tubes, and for this purpose the socket 20 is made with an opening 21 into which is thrust the tube base 9. Other forms of sockets may be used so that the one disclosed herewith is a mere example.

Metallic shielding means with a ground connection is applied to the base 20 and this may be carried out by a plating process similar to that heretofore described in connection with the tube. However, I show a separate metal housing 22 having an upper flared opening or mouth 23 through which is thrust the tube or other separable electrical plug-in devices. The shielding housing 22 may be closed at the bottom by a plate or cover 24 unless it is desired to make the entire socket shield in one piece. The cover 24 may include a flange 25 which embraces the lower edge of the housing 22 to form a closed and positively shielded construction.

The upper open mouthed end 23 is flared and made resilient in any suitable way as by cutting slits 24 in the mouth 23. In this way the shield mouth 23 is made resilient and dilates upon sliding entry of the tube base 9. As the tube is pressed into the socket, the flared socket mouth 23 presses and engages spring-like against the metallic coating 12 on the base and thereby establishes positive electrical contact between the socket shield 22 and the metallic coating 12 on the tube.

A single ground wire 27 fastened to one of the screws 26 as a binding post on the shielded socket satisfactorily conducts away and grounds all stray radio signals received and collected by the shields of the tube or socket, because positive electrical contact is established between the metallic coating on the tube and socket so that in grounding either shielded member, the other shielded member is likewise grounded.

A device of this kind fills a need for a new type socket and tube. It has few parts and improves the receiving qualities of the tube and radio receiving set, and other like electrical devices.

What I claim is:

1. A vacuum tube comprising the usual bulb and base supporting it, bosses formed on the base, contacts anchored in the bosses, a metallic coating covering the bulb and base but not covering the bosses.

2. A vacuum tube comprising a glass bulb mounted in a base, contacts carried in the base, a metallic coating enveloping the bulb and base reaching down to a point adjacent the contacts but not connecting therewith, a metal part encircling the tube and encased in the metallic coating, and wire connecting means included on the part.

3. A vacuum tube comprising a bulb mounted in a base, and electric contacts carried with the base, a current conductor encircling the bulb against the base and including terminal means, and a metallic coating covering the vacuum tube and the current conductor.

4. A thermionic tube and socket, shielding means carried on and covering the tube, shielding means covering the socket, and means enabling the two shielding means to engage and connect each other when the tube is thrust into the socket.

5. A thermionic tube and socket, shielding means carried on and covering the tube, shielding means covering the socket, and a flared resilient opening included in one of the shielding means by which the shields engage and connect each other when the tube is placed in the socket.

6. A thermionic tube and socket, shielding means carried on and covering the tube, shielding means covering the socket, and a flared resilient opening included on the shielding means of the socket to receive, engage, and electrically connect with the shielding means of the tube.

7. A vacuum tube comprising a bulb and a base supporting it and contacts carried with the base; said base including an upper edge, a wire loop disposed around the vacuum tube at the edge of the base, and a shield carried with the tube and covering over and connecting with the wire loop.

8. A vacuum tube comprising a bulb and a base supporting it and contacts carried by the base; said base including an upper edge, a wire loop disposed around the vacuum tube at the edge of the base, said wire loop having a flexible terminal externally of the bulb and which extends away from the vacuum tube and which is adapted to be connected to a ground, and a shield coating applied over the tube and connecting with the wire loop.

9. A vacuum tube comprising a hollow base of insulation material cylindrical in form and having an open end defined by an upper edge, a glass bulb mounted within the open end of the base, electric contact prongs mounted in the lower end of the base, a grounding conductor applied to the glass bulb adjacent the upper edge of the base, and a metallic coating applied directly to the external surface of the glass bulb and covering said grounding conductor at the upper edge of the base and being electrically connected with said conductor to carry off stray electro magnetic waves thus shielding the tube against static influence.

10. A vacuum tube comprising a hollow base of insulation material cylindrical in form and having an open end defined by an upper edge, a glass bulb mounted within the open end of the base, electric contact prongs

mounted in the lower end of the base, a grounding conductor applied to the glass bulb adjacent the upper edge of the base, and a metallic coating applied directly to the external surface of the glass bulb and to the external surface of the cylindrical base and covering said grounding conductor at the upper edge of the base and being electrically connected with said conductor to carry off stray electro magnetic waves thus shielding the tube against static influence.

In testimony whereof I affix my signature.

HERMAN L. STRONGSON.