Nov. 23, 1937. F. J. TRAVIS 2,100,042

TUBE HOLDER

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Fig. 1.

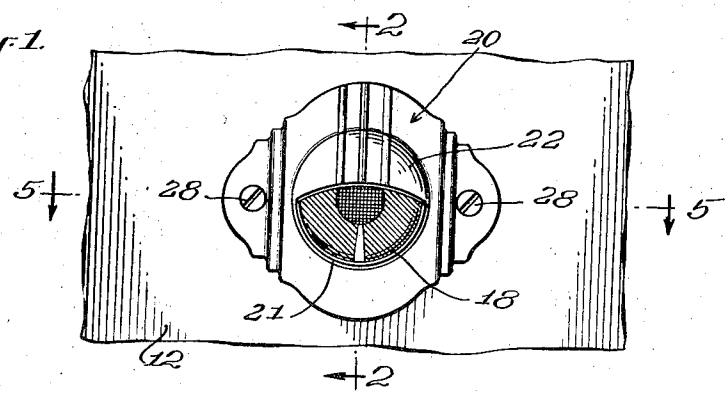


Fig. 2.

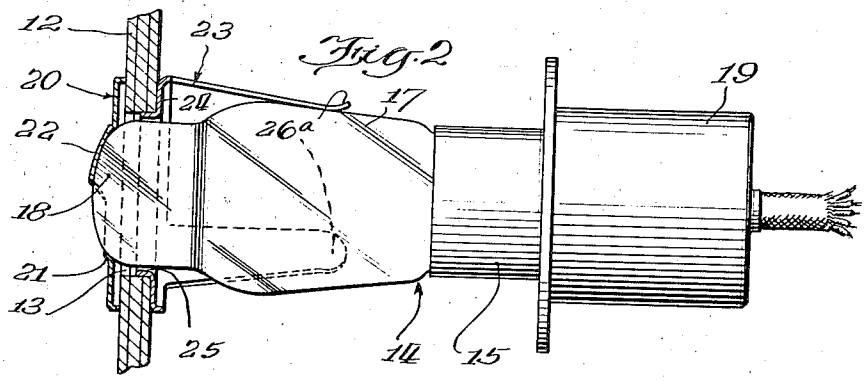


Fig. 3.

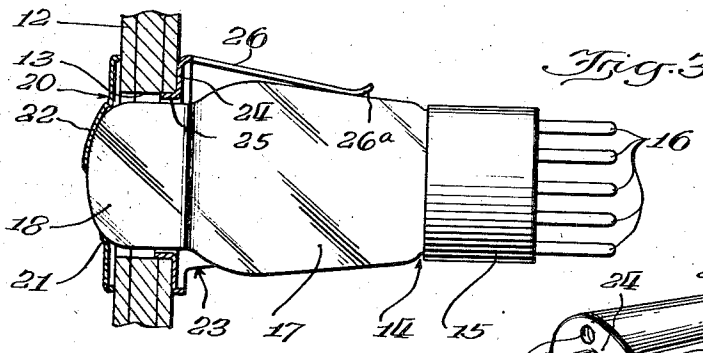


Fig. 4.

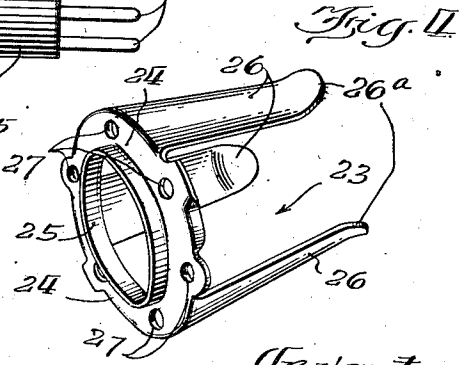
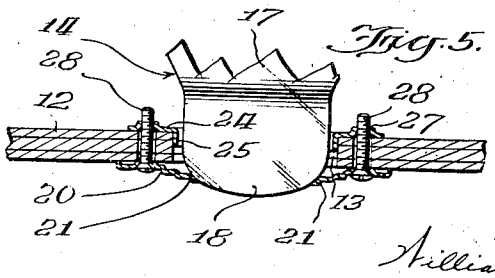


Fig. 5.



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Fig. 6.

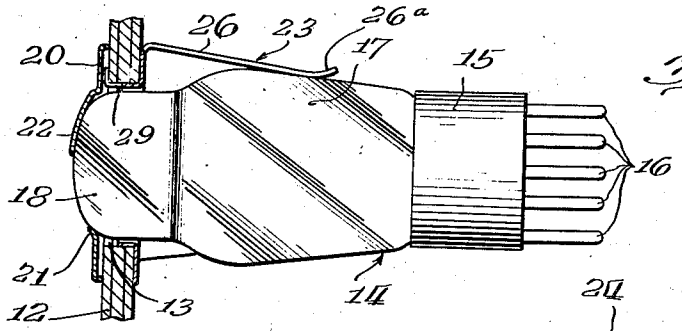


Fig. 7.

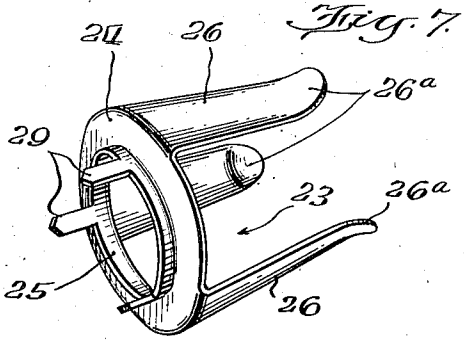


Fig. 8.

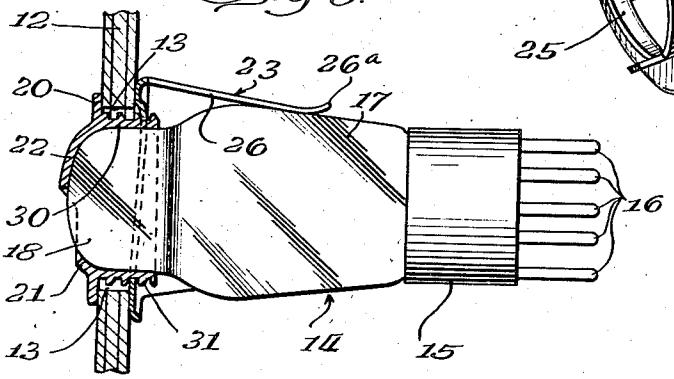


Fig. 9.

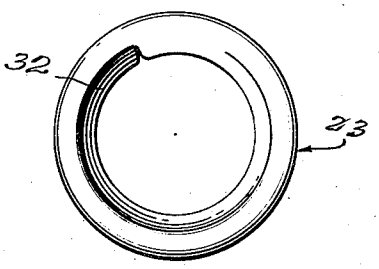


Fig. 11.

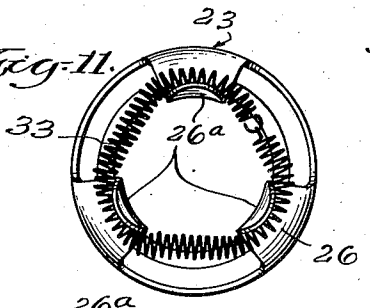
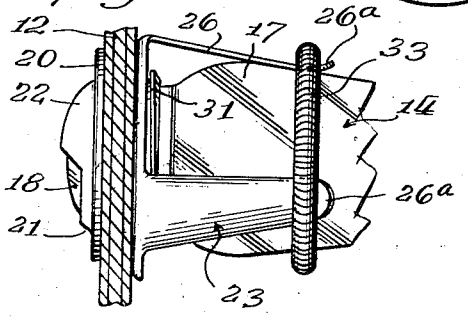


Fig. 10.



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UNITED STATES PATENT OFFICE

2,100,042

TUBE HOLDER

Frederick J. Travis, Chicago, Ill.

Application April 17, 1937, Serial No. 137,431

14 Claims. (Cl. 250—27.5)

My invention contemplates and provides a novel and advantageous holder for tubes of the kinds employed in radio sets.

The holder of the present invention is particularly adapted to receive and support a tube, e. g., a cathode ray tuning indicator, which is to have the tip of its glass envelope exposed to view through an aperture in a panel of a receiving set.

An important feature of the present invention is that all parts of the tube embracing and engaging elements of the holder lie substantially away from the base of a tube which it supports.

Another salient feature of the invention is that the tube receives all of its support from holder elements engaging its glass envelope.

Another important feature of the holder of my invention is that it will act automatically properly to position and retain the supported tube, in the tube exposing aperture of a panel to which the holder is applied, even though the panel be of any one of several different thicknesses.

Still another feature of the holder is that it is devoid of any screw-secured tube holding elements to be tightened when a tube is placed in the embrace of the holder, or to be loosened when a tube is removed from the embrace of the holder.

In its preferred forms the tube holder of the present invention comprises a metal annulus capable of being easily and quickly applied to a panel in axial alignment with an aperture in the panel, such annulus being provided with three or more spring fingers adapted to embrace the glass envelope of a tube and, by cam action with a tapering wall of the tube envelope, urge the tube tip through the annulus and panel aperture and against a tube tip seat carried by the panel,—such tube tip seat conveniently being afforded by a conventional or other escutcheon carried on the outer surface of the panel.

Other features, objects and advantages of my invention will appear from the following detailed description, wherein reference is made to the accompanying two sheets of drawings, in which

Fig. 1 is an elevational view of the outer surface of a receiving set panel to which the holder of the present invention has been applied;

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1 and looking in the direction indicated by the arrows;

Fig. 3 is a view similar to Fig. 2 but showing the holder applied to a panel of considerably greater thickness than the one depicted in the first two figures;

Fig. 4 is an isolated perspective of the one-piece stamping which provides the spring fingers which with substantial but yielding pressure embrace the glass envelope of a tube supported by the holder;

Fig. 5 is a horizontal sectional view taken on the line 5—5 of Fig. 1 and looking in the direction indicated by the arrows;

Fig. 6 is a view similar to Fig. 2 and illustrating a modified form of the invention;

Fig. 7 is an isolated perspective of the tube embracing one-piece stamping forming part of the holder depicted in Fig. 6;

Fig. 8 is a view similar to Figs. 2 and 6, but illustrating still another embodiment of my invention;

Fig. 9 is an elevational view of one end of the tube embracing stamping of Fig. 8, i. e., the end of such stamping which lies against the panel and has threaded engagement with an escutcheon boss projecting inwardly through the panel;

Fig. 10 is an elevational view illustrating how a coiled spring may be stretched around the spring fingers of the tube embracing stamping to enhance the security of an embraced tube during rough handling, as in shipping, of a radio set of which it forms a part; and

Fig. 11 is an end view illustrating the same coiled spring as it appears upon the spring fingers prior to the application of a tube into the embrace of such fingers.

Similar characters of reference refer to similar parts throughout the several views.

Referring particularly to Figs. 1, 2, 4 and 5, reference numeral 12 denotes a panel, usually laminated as shown, which may be regarded as forming a part of a receiving set. Such panel is provided with a circular aperture 13 into which the tip of a radio tube is to project in order that it may be visible exteriorly of the panel.

The radio tube, denoted as a whole by reference numeral 14, may be regarded as being a cathode ray tuning indicator or "Magic Eye" of the kind now and heretofore supplied by R. C. A. Manufacturing Co., Inc., of Camden, New Jersey. However, the holder of the present invention is not limited to the supporting of tuning indicator tubes. Other kinds of radio tubes, and more particularly other kinds of radio tubes to be displayed through a panel aperture, may be placed in the holder of the present invention.

The tube comprises the usual base 15 carrying prong contacts 16, and the usual glass envelope. The body portion of the envelope, depicted at 17, has a decided taper toward base 15, the tip portion 18 of the envelope being of considerably less diameter than the said body portion 17. The frusto-conical surface presented by the body portion 17 of the envelope is quite helpful in the functioning of my novel holder, as will presently appear.

At 19, in Fig. 2, is illustrated a socket for application to the prong contacts 16 of tube 14.

I contemplate providing the panel 12 with a

seat for the tube tip 18 and prefer that such seat be afforded by a conventional or other suitable escutcheon 20 applied to the outer surface of the panel. The tube tip seat which such escutcheon affords is indicated at 21. When tube 14 is a cathode ray tuning indicator, seat 21 may be conformed also to constitute a partial hood or visor 22 which, as usual, overlies the upper portion of the tube tip and appropriately leaves only the lower portion thereof visible exteriorly of the panel.

Indicated in its entirety by reference numeral 23, is a one-piece stamping which is preferably formed of a light grade of steel stock that is sufficiently stiff to insure that the presently-to-be-mentioned spring fingers thereof grasp, hold and exert seating pressure upon a tube envelope which has been thrust into their embrace.

Stamping 23, as depicted in Figs. 1 to 5, comprises an annulus 24 having turned forwardly from its inner edge a flange 25 arranged to project into panel aperture 13 when the annulus is held against the panel as shown.

Rearwardly turned from the outer edge of annulus 24 are two or more, preferably three, spring fingers 26. The free ends of these spring fingers are turned slightly outwardly from a common center, as indicated at 26—*a*, —the free ends of these spring fingers also being closer together than are the ends thereof which join annulus 24.

Formed in annulus 24 is a plurality of pairs of apertures 27, one pair of these apertures being unthreaded and the apertures of the other pairs being threaded and appropriately spaced to receive screws passing through alignment openings in the panel and a selected escutcheon. The unthreaded pair of apertures 27 is used when the stamping 23 is to be pinned to a panel independently of any escutcheon.

As depicted in Figs. 1 and 5, the screws 28 extend through escutcheon 20, and the panel, and have threaded engagement in suitable ones of the apertures 27 firmly to clamp the escutcheon and the annulus 24 to the panel.

To place a tube, such as 14, in the holder described, the tube is brought into the embrace of the spring fingers 26 with the tube tip 18 directed toward seat 21. Under further pressure of the tube toward the panel the spring fingers spread to pass the rounded shoulder which joins tube tip 18 with body portion 17 of the tube envelope. Thereafter, as the tips of the spring fingers ride upon the frusto-conical surface of body portion 17, i. e., the surface which tapers toward base 15, the spring fingers urge the tube toward the panel, move tip 18 through annulus 24 and panel aperture 13 and then hold the said tip snugly in engagement with seat 21.

A holder of the kind just described is very satisfactory because of the simplicity and cheapness of its parts, the facility of its application to a panel, the ease with which a tube may be inserted into and removed from its embrace, and the continuous pressure with which the spring fingers hold the tube tip to its seat. Socket 19 may be applied to the prong contacts 16 either before or after placement of the tube in the holder. The tube readily may be turned about its longitudinal axis without disengaging it from the holder. This is of considerable importance when the tube is a cathode ray tuning indicator. The panel to which the holder is applied may be of any of the thicknesses customarily found in radio sets. When the panel is quite thick, as illustrated in Fig. 3, the spring fingers 26, after seating the tube tip, merely lie on the tube envelope at points closer to the base 15 than they do when the panel is relatively thin. See Fig. 2.

In that embodiment of my invention which is illustrated in Figs. 6 and 7, the annulus 24 of the one-piece stamping 23 may be imperforate and the flange 25 provided with integral tangs 29. When the stamping 23 is applied to the panel, these tangs are extended through the panel aperture 13 and are turned tightly against the outer surface of the panel and are covered by the escutcheon 20. In this instance the escutcheon 20 is pinned or otherwise secured to the panel quite independently of stamping 23.

In that form of the invention which is exhibited in Figs. 8 and 9, the escutcheon 20, which in this instance may be formed of molded material, comprises an integral hollow boss 30 which extends through the panel aperture 13. Such boss is provided with an external thread 31 arranged to cooperate with a single thread 32 which is stamped in and from the metal of annulus 24. By threadedly tightening stamping 23 on escutcheon 20, the panel is tightly clamped between them.

If a radio set equipped with the improvements of the present invention is to be shipped, or otherwise subjected to the possibility of very rough handling, I may resort to the expedient illustrated in Figs. 10 and 11 to insure that the tube 14 will not be accidently dislodged from or loosened in the embrace of its holder. A coiled spring 33, having hook ends, is stretched around the tips of spring fingers 26 before the insertion of the tube 14 into the holder. Then, when the tube is inserted into the holder, the several spring fingers are retained so tightly against the frusto-conical surface of the tube envelope that accidental dislodgment or loosening of the tube is virtually impossible.

In the several herein described embodiments of my invention the tube tip seat 21 has been formed, as is preferable, on the escutcheon 20. However, I wish to have it understood that I do not exclude from the purview of my invention, holders in which the said tube tip seat is formed on either the panel 12 or the annulus of the member 23.

Having thus illustrated and described my invention, what I claim is new and desire to secure by Letters Patent of the United States is:

1. A radio tube holder comprisng an annulus adapted to be secured to one side of a panel with the opening of the annulus in registry with a panel aperture in which the tip of a radio tube is to be presented, and a plurality of spring fingers carried by said annulus, said spring fingers being adapted to embrace and press against a tapering part of a radio tube with a cylindrical tip to urge the tube tip through said annulus and into the panel aperture.

2. In combination with a radio tube comprising a vacuum envelope with a cylindrical tip and a relatively large rear tapering portion, a panel, an aperture therein, an escutcheon on the panel exterior having a window in alignment with said aperture and provided with a seat for said cylindrical tip projecting through said aperture from the inner side of the panel, and a plurality of spring fingers carried by the panel and projecting away from the inner face thereof, said spring fingers being adapted to embrace and press against said relatively large tapering portion of a radio tube and, by so doing, yieldingly urge the

tube tip through said aperture and into engagement with said seat.

3. In a radio tube holder a one-piece stamping, comprising an annulus, adapted for attachment to a panel in registry with an opening in the panel, and a plurality of spring fingers projecting away from the annulus and the panel whereto the stamping is attached, said spring fingers being adapted to engage and press against a tapering part of a radio tube yieldingly to urge its cylindrical tip through the annulus and into the panel aperture.

4. In combination a panel, an aperture therein for the reception of a tube tip to be visible exteriorly of the panel, an escutcheon on the exterior of the panel, said escutcheon being provided with a fenestration and a tube tip seat, an annulus disposed on the inner surface of the panel with the opening of the annulus in registry with the panel aperture, a flange on the annulus projecting into the panel aperture, at least three spring fingers carried by the annulus and projecting away from the panel, said spring fingers being adapted to embrace and press against a tapering part of a radio tube to urge the tip of said tube through the annulus and said panel aperture and against said seat, and screws, passing through the escutcheon and panel, having threaded engagement with said annulus firmly to clamp the panel between the annulus and the escutcheon.

5. In combination a panel, an aperture therein for the reception of a tube tip to be visible exteriorly of the panel, an escutcheon secured to the panel and provided with a fenestration and a seat for a tube tip projecting through said aperture from interiorly of the panel, an annulus disposed on the interior surface of the panel with the opening of the annulus in registry with the panel aperture, said annulus having tangs which extend through the panel aperture and are turned against the exterior of the panel to underlie the escutcheon, and a plurality of spring fingers carried by said annulus arranged to embrace and press against a tapering part of a radio tube yieldingly to urge the tip of the tube through the annulus and panel aperture and against the aforesaid tube tip seat.

6. In combination a panel, an aperture therein for the reception of a tube tip to be visible exteriorly of the panel, an escutcheon mounted on the panel exterior and provided with a fenestration and a seat for a tube tip projecting through said aperture from interiorly of the panel, said escutcheon comprising an externally threaded hollow boss which projects through the panel aperture, an annulus disposed against the inner surface of said panel and being threaded upon said hollow boss, said annulus carrying a plurality of spring fingers adapted to embrace and press against a tapered part of a radio tube yieldingly to urge the tip of said tube through the annulus and said hollow boss and against the aforesaid tube tip seat.

7. In combination, a member whereon a radio tube is to be mounted, a tube tip seat carried by said member, a plurality of spring fingers adapted yieldingly to embrace a tapered part of a tube envelope and urge its tip into engagement with said seat, and a coiled spring stretched around said spring fingers substantially as and for the purpose described.

8. In combination with a panel, an aperture therein for the reception of a tube tip, a seat carried by the panel for engagement by the tube tip when the latter is disposed in said aperture, at least three spring fingers carried by and projecting away from the panel, said spring fingers being adapted to embrace a tapered part of a tube envelope and thereby yieldingly urge its tip into said aperture and against said seat, and a coiled spring stretched around said spring fingers substantially as and for the purpose described.

9. In combination with a suitable member, a radio tube adapted to be mounted thereon, including an envelope comprising a projecting hollow tip and a relatively larger tapered portion which tapers away from the projecting hollow tip, a seat for the said tip, and at least three spring fingers adapted to embrace and press against the larger tapering portion of the tube envelope to urge and hold the said tip firmly against said seat.

10. In combination with a panel having an aperture therein, a radio tube comprising a glass envelope with a projecting hollow tip portion adapted to be visible exteriorly of the panel and an enlarged tapered portion, a seat carried by the panel to receive the projecting hollow tip in alignment with the panel aperture and means carried on and interiorly of the panel adapted to yieldingly embrace and press against the said enlarged tapered portion of the tube envelope to urge and hold the said tip in the panel aperture and against the said seat.

11. In combination with a suitable member, a radio tube adapted to be mounted thereon, the envelope of said tube including a cylindrical tip portion and a relatively larger rearwardly tapering portion, a seat for said cylindrical tip carried by said member, and a plurality of fingers adapted yieldingly to embrace the said relatively larger tapering portion of the tube envelope and urge the said tip into engagement with said seat.

12. In combination with a panel, an aperture therein for the reception of a tube tip, a tube, a tube envelope including a cylindrical tip portion and a relatively larger tapering portion, a seat carried by the panel for engagement with the said tube tip when the latter is disposed in said aperture, and a plurality of spring fingers carried by and projecting away from the panel, said spring fingers being adapted to embrace said relatively larger tapering portion of the tube envelope and thereby yieldingly urge its cylindrical tip into said aperture and against the said seat.

13. In combination with a suitable member whereon a radio tube is to be mounted, a radio tube with an envelope including a cylindrical tip and a relatively large tapering portion, a tube tip seat carried by said member and a plurality of spring fingers carried by and projecting away from the member, said spring fingers being adapted to embrace and yieldingly press against the relatively large tapering portion of the tube envelope to urge and hold its tip against said seat.

14. In combination with a radio tube including an envelope having a cylindrical tip and a relatively large tapering portion, a panel having an aperture therein and provided with a seat for the cylindrical tube tip disposed in said aperture, and means for yieldingly and rotatively supporting the radio tube with its tip disposed in said aperture and against said seat, said means comprising a plurality of spring fingers projecting from the panel and adapted to engage and press against said tapering portion of the tube envelope.

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