Jan. 17, 1956 W. L. SEITZ 2,731,229

INSTRUMENT MOUNTING AND CLIP THEREFOR

Filed May 28, 1953

Fig. 1.

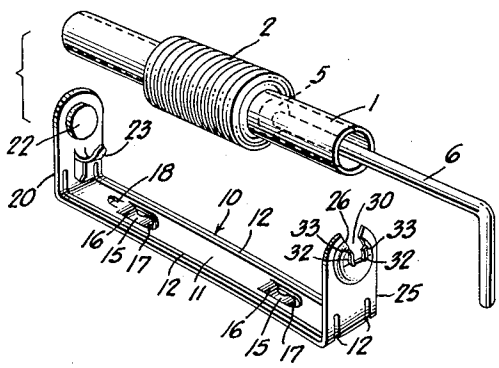


Fig. 2.

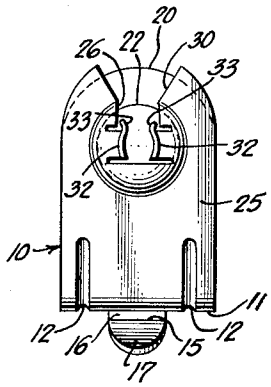


Fig. 4.

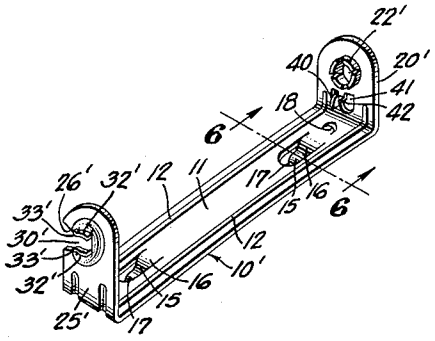


Fig. 3.

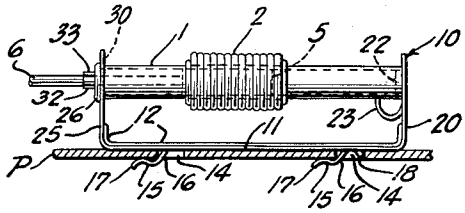


Fig. 6.

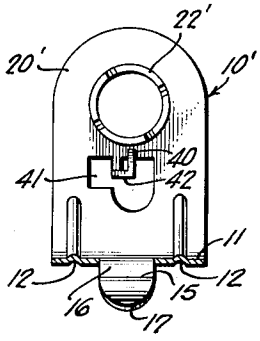
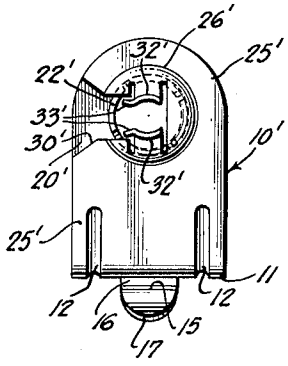


Fig. 5.



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INSTRUMENT MOUNTING AND CLIP THEREFOR

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12 Claims. (Cl. 248—300)

This invention relates in general to fastening devices for instrument mountings and deals, more particularly, with improved fastening devices for mounting an elongate type of instrument or similar object in generally parallel relation to a supporting panel, or other support.

The fastening devices of the present invention are particularly useful for mounting various instruments such as tuning coil forms or like control units of television and radio apparatus which embody a tubular body that is secured to a relatively thin panel forming the chassis of the television or radio apparatus. In many instances, it is necessary or desirable to mount the coil form or other instrument within the chassis in close parallel relation to the supporting panel in order to conserve space and otherwise provide a simplified mounting of the coil form without using auxiliary fastening means which occupy extra space and require extra time for assembly and thereby add to the cost of manufacture.

A primary object of the invention, therefore, is to provide an improved instrument mounting and fastener therefor by which an instrument such as a coil form, or the like, is mounted in close, substantially parallel relation to a supporting panel or other support.

A further object is to provide such an instrument mounting in which the coil form, or the like, is mounted in substantially parallel relation to a supporting panel or other part together with suitable provision for axial adjustment of the movable core in operative position within the coil form.

Another object of the invention is to provide an improved fastening device for an instrument mounting, such as described, in which the fastening device is provided as a one-piece clip, or the like, comprising means for attaching the clip to a supporting part and means for mounting the coil form in close, parallel relation to the supporting part together with means retaining the movable core in adjustable position within the coil form.

A further object of the invention is to provide such a fastening device comprising a multiple clip construction by which both the coil form and adjustable core are readily snapped into secured relation with the fastening device and with the movable core frictionally and grippingly retained in operative position within the coil form and adapted for any desired adjustment therein.

Further objects and advantages and other new and useful features in the construction, arrangement and general combination of elements and details of construction of the improved instrument mounting and fastening devices therefor, in accordance with the invention, will be readily apparent as the following description proceeds with reference to the accompanying drawings, for purposes of illustration but not of limitation, in which like reference characters designate like parts throughout, and in which:

Fig. 1 is a perspective view showing a fastening device in accordance with the invention and a coil form to be mounted thereby arranged in position to be applied to said fastening device;

Fig. 2 is an end view of the fastening device seen in Fig. 1; and,

Fig. 3 shows the fastening device of Fig. 1 in edge elevation as attached to a supporting panel and securing in mounted position the coil form and associated movable core in said coil form.

Fig. 4 is a perspective view of another form of fastening device in accordance with the invention;

Fig. 5 is an end view of the fastening device seen in Fig. 4; and,

Fig. 6 is a sectional view of Fig. 5 along line 6—6, looking in the direction of the arrows.

Referring now, more particularly, to Figs. 1 to 3, inclusive, of the drawings, there is shown in Fig. 3 the general organization of a mounting for an elongate instrument such as a tuning unit, or the like, which is secured in generally parallel relation to a panel P of a television or radio chassis, for example. The tuning unit comprises a generally tubular body member **1** such as a sleeve, tube or cylinder, or the like, which is constructed of any suitable material such as cardboard, composition material, plastic, etc., and which serves as the coil form or equivalent body of any related type of instrument to be mounted on the supporting panel P. The coil form or tubular body **1** is provided with a winding **2** connected to suitable terminals (not shown) and a movable core **5** within said tubular body **1** which is longitudinally adjustable therein by a rod or shaft **6** connected to said core **5**.

The fastening device or clip, designated generally **10**, is a relatively simple and cheap article of manufacture in that it is most economically constructed from a comparatively small, inexpensive section of any suitable sheet metal, preferably that of a spring metal nature, such as spring steel or cold rolled metal having spring-like characteristics. The fastening device **10** may be formed from sheet metal sections of various outlines, of course, but from the standpoint of economical quantity production is most advantageously provided from a generally rectangular blank obtained from standard sheet metal strip stock with little or no loss or waste of material. As seen in Fig. 1, a blank or stamping of such character is bent into the general form of a substantial U-shape comprising an elongate base **11** intermediate a pair of cooperating arms **20**, **25**, spaced apart a distance approximating the length of the tube or sleeve defining the coil form or body member **1**. Preferably longitudinal strengthening ribs **12** extending lengthwise of said base **11** and into adjoining portions of the arms **20**, **25**, are provided together with suitable attaching means on said base **11** for securing the same to the panel P or other support.

A preferred form of attaching means is provided by a pair of spaced hooks **15** stamped from the base **11** and projecting from the undersurface thereof in position to be received in correspondingly spaced attaching openings **14** in the panel P, as seen in Fig. 3. Each of the spaced hooks **15** defines a shoulder **16** immediately adjacent the base **11** while a free end portion thereof is bent outwardly to provide a flared lip **17** inclined toward the work engaging or bearing portion of said hook **15**. Said hooks **15** extend in the same direction in generally parallel relation to the base **11** with the bearing portion of each hook spaced from said base **11** a distance slightly less than the thickness of the panel P in order to grip the same firmly, and with the lip **17** flared outwardly to a spacing considerably greater than the thickness of said panel P to facilitate the initial application of the hook **15** over the panel edge adjacent the associated attaching opening **14**. At least one of said hooks **15**, preferably the rearward hook, is provided with a cooperating detent **18** adapted to lock said hook in attached position in its associated panel opening **14**.

Such a locking detent 18 may be of any suitable character and is preferably provided by a small projection which is pressed outwardly out of the plane of the base 11 such that the projecting end thereof defines a relatively sharp shoulder adapted to abut the adjacent wall of the attaching opening 14 in positive locking relation therewith, as shown in Fig. 3. Said detent 18, otherwise, is so provided that the extremity thereof is spaced from the shoulder 16 of the attaching hook 15 a dstance slightly less than the spacing of opposing wall portions of the assembling opening 14 to engage an adjacent wall thereof in oppostion to removal or displacement of said hook 15 from fully attached position in said opening 14.

The spaced hooks 15, accordingly, cooperate with each other to hold the fastening device 10 in attached position on the panel P as shown in Fig. 3. The attaching openings 14, are provided with a spacing corresponding substantally with the spacing of said hooks 15 so as to receive the same readily, whereupon the fastening device 10 is moved laterally to position said hooks 15 in offset relation to said openings and in tensioned engagement with the undersde of the panel P adjacent said openings 14 in fully applied position. The fastening device 10, otherwise, is locked in such applied position by the detent 18 which snaps into the adjacent opening 14 and engages the wall of said opening opposite to that engaged by the shoulder 16 of the associated hook 15. The detent 18 thus prevents any reverse movement or displacement of the fastener base 11 in the direction of removal of the hooks 15 from their respective attaching openings 14 such that the fastener 10 is positively locked in attached position on the panel P.

The rearward arm 20 of the fastening device is provided with a depression or extrusion on its outer face defining an inward projection in the form of an annular boss 22, Fig. 1, corresponding substantially to the inner diameter of the tubular body or coil form 1 so as to be snugly received in the rear end of said tubular coil form 1 as shown in Fig. 3. An anchoring tab in the form of a prong 23 is stamped from said arm 20 and is bent inwardly to locate the pointed end thereof in position to embed in the adjacent rear end of the coil form 1 when telescoped over the annular boss 22 in secured position, such that the coil form 1 is thus anchored in secured position against relative rotative displacement.

The forward arm 25 is provided on its inner face with an outwardly dished or cup-shaped formation defining an annular socket 26 corresponding substantially to the outer diameter of the forward end of the coil form 1 so as to snugly receive and retain the same in cooperation with the annular boss 22 supporting the rear end of said coil form 1. In order to secure the forward end of the coil form 1 with the movable core 5 assembled therein, the outer periphery of said arm 25 is provided with a cutout either along its top as shown in Figs. 1 and 2, or along a side thereof as seen in Figs. 4 and 5, which defines an assembling opening permitting the projecting rod 6 of the movable core 5 to be applied and secured at the same time that the forward end of the coil form 1 is applied and secured in the annular socket 26.

In the clip of Figs. 1–3, the arm 25 is provided with such a cutout 30 along its upper edge defining a V-shaped opening leading to a passage between a pair of spaced resilient tongues 32 that are adapted to engage and retain therebetween the rod 6 of the movable core member 5. Said spaced tongues 32, otherwise, are sufficiently resilient as to permit forcible sliding of the rod 6 relatively thereto to provide any desired adjustment of the core 5 within the coil form or body 1 as secured between the arms 20, 25, of the fastening device 10, but otherwise have a tensioned frictional engagement with said rod 6 as necessary to retain said core 5 against displacement or loosening from any setting thereof within said coil form 1.

In a preferred construction of such spaced tongues 32, a substantially diametric strip across the wall of the socket 26 in arm 25 is stamped therefrom and slit transversely to provide a pair of opposing strip portions having their ends bent outwardly out of the plane of said wall and curved transversely in an arcuate form to define cooperating curved surfaces adapted to engage relatively wide portions of said rod or shaft 6 in tensioned frictional and gripping engagement therewith. The spaced tongues 32 preferably are provided with their outwardly bent ends having upper enlargements defining diverging guide surfaces 33, Fig. 2, which facilitate assembly of the rod 6 between the curved rod engaging surfaces of said spaced tongues 32.

In use, it will be understood that the coil form 1 and movable core 5 assembled therein are readily secured to the fastening device 10 either prior to or after said fastening device 10 is attached to the supporting panel P by the spaced hooks 15 received in the correspondingly spaced openings 14 in said panel P and locked therein by the detent 18, substantially as described. In either case, the coil form 1 with the movable core 5 assembled therein is readily secured between the arms 20, 25, of the fastening device 10 with the rear end of said coil form 1 seating snugly over the annular boss 22 on arm 20, in which position the prong 23 embeds in the body of said coil form 1 to anchor the same in applied position. The forward end of the coil form 1 is then applied to seat in the annular socket 26 in arm 25 and said arm 25 is flexed outwardly if necessary for this purpose. At the same time, the rod 6 of the core member 5 is passed through the cutout 30 and is pressed against the outwardly flared diverging guide surfaces 33 on the spaced tongues 32 to cause the same to spread apart as necessary to permit the rod 6 to snap past said guide surfaces 33 into the space between the curved rod engaging surfaces of said tongues 32. The fastening device 10 thus firmly and rigidly supports the assembled coil form 1 and core member 5 in operative relation, and the mounting of the instrument on panel P is thereby completed with said core member 5 readily adjustable in the core form 1 by a suitable push or pull on the rod 6 as necessary to slide the same relatively to the spaced tongues 32 in frictional gripping engagement therewith.

Figs. 4–6, inclusive, disclose another form of clip or fastening device 10′ which is generally equivalent in construction and similar in application and use to that described with reference to Figs. 1–3, inclusive. In this form of the fastening device, the forward arm 25′ is provided with a similar cutout 30′ in an alternate construction wherein such cutout opens to the side of the arm 25′ and leads to the similar annular socket 26′ and spaced resilient tongues 32′ provided with diverging guide surfaces 33′ which facilitate assembly of the rod 6 of the movable core 5 between said spaced resilient tongues 32′ in the same general manner as in the previously described form of the invention.

The rearward arm 20′ is provided with a similar extrusion defining an annular boss or protuberance 22′ in the form of a circular hub which is readily stamped in said arm 20′ with an open central area as shown in Figs. 4 and 6. This form of the fastening device 10′ also includes an alternate type of anchoring tab 40 having a straight edge portion extending lengthwise of the longitudinal coil form or body member 1 and adapted to embed therein in a manner which positively retains the coil form 1 against possible rotative shifting or displacement in assembled relation between the arms 20′, 25′ of the fastening device. The anchoring tab 40 of this character is provided by a suitable cutout 41 in the rearward arm 20′, Fig. 6, as necessary to define an integral strip 42 having a lateral enlargement defining said tab 40. The

integral strip 42 is bent to project inwardly from said arm 20', and the lateral enlargement 40 is bent upwardly to position the edge thereof adjacent the annular boss 22' and spaced therefrom a distance less than the thickness of the wall of the coil form 1. Said prong 40 is thereby adapted to cut into and embed in the rear end of the coil form 1 when telescoped over said boss 22' in the assembled relation of the coil form 1 with the clip or fastening device 10' in substantially the same manner and for the same function and use described with reference to Figs. 1–3, inclusive.

The clip or fastening device, in either form, preferably is constructed of relatively thin sheet metal the thickness of which is selected according to service requirements and the predetermined size of the members of the instrument and the parts of the assembly. The clip or fastening device is most effective when provided of spring metal suitably spring tempered and otherwise treated to give the desired toughness and hardness, particularly in the case of devices which are intended for heavy duty applications. A cheap and highly satisfactory clip or fastening device in accordance with the invention may be provided from cold rolled metal such as cold rolled steel which is untempered but of a spring metal nature and capable of providing an effective and reliable fastening device, as and for the purposes described.

While the invention has been described in detail with specific examples, such examples are intended as illustrations only inasmuch as the invention fully contemplates modifications which may be provided without departing from the spirit and scope of the invention.

What is claimed is:

1. A fastening device for an instrument comprising an elongate tubular body and a member movable in said tubular body having an axially adjustable rod projecting from one end of said tubular body, said fastening device comprising a piece of sheet metal bent to provide a base adapted to be attached to a support and spaced arms extending substantially at right angles from said base for engaging the ends of said tubular body to mount said tubular body in substantially parallel relation to said support, one of said arms having gripping elements for rigidly supporting said rod but adapted to permit axial adjustment of said rod.

2. A fastening device for an instrument comprising an elongate tubular body and a member movable in said tubular body having an axially adjustable rod projecting from one end of said tubular body, said fastening device comprising a piece of sheet metal bent to provide a base adapted to be attached to a support and spaced arms extending substantially at right angles from said base for engaging the ends of said tubular body to mount said tubular body in substantially parallel relation to said support, one of said arms having a passage for said rod on said movable member and gripping elements adjacent said passage for rigidly supporting said rod but adapted to permit axial adjustment of said rod.

3. A fastening device for an instrument comprising an elongate tubular body and a member movable in said tubular body having an axially adjustable rod projecting from one end of said tubular body, said fastening device comprising a piece of sheet metal bent to provide a base adapted to be attached to a support and spaced arms extending substantially at right angles from said base for engaging the ends of said tubular body to mount said tubular body in substantially parallel relation to said support, one of said arms having a passage for said rod on said movable member and a pair of spaced tongues adjacent said passage defining gripping elements for rigidly supporting said rod but adapted to permit axial adjustment of said rod.

4. A fastening device for an instrument comprising an elongate tubular body and a member movable in said tubular body having an axially adjustable rod projecting from one end of said tubular body, said fastening device

comprising a piece of sheet metal bent to provide a base adapted to be attached to a support and spaced arms extending substantially at right angles from said base for engaging the ends of said tubular body to mount said tubular body in substantially parallel relation to said support, one of said arms having an inwardly projecting boss receivable in one end of said tubular body in secured relation therewith, the other of said arms having a passage for said rod on said movable member and gripping elements adjacent said passage for rigidly supporting said rod but adapted to permit axial adjustment of said rod.

5. A fastening device for an instrument comprising an elongate tubular body and a member movable in said tubular body having an axially adjustable rod projecting from one end of said tubular body, said fastening device comprising a piece of sheet metal bent to provide a base adapted to be attached to a support and spaced arms extending substantially at right angles from said base for engaging the ends of said tubular body to mount said tubular body in substantially parallel relation to said support, one of said arms having an inwardly projecting boss receivable in the adjacent end of said tubular body in secured relation therewith, and an element provided from the material of said arm and bent to define an anchoring tab adapted to embed in said tubular body in cooperation with said boss when positioned in the end of said tubular body, the other of said arms having a passage for said rod on said movable member and gripping elements adjacent said passage for rigidly supporting said rod but adapted to permit axial adjustment of said rod.

6. A fastening device for an instrument comprising an elongate tubular body and a member movable in said tubular body having an axially adjustable rod projecting from one end of said tubular body, said fastening device comprising a piece of sheet metal bent to provide a base adapted to be attached to a support and spaced arms extending substantially at right angles from said base for engaging the ends of said tubular body to mount said tubular body in substantially parallel relation to said support, one of said arms having a socket for receiving an end of said tubular body in secured relation therewith, said socket having a passage for said rod on said movable member and gripping elements adjacent said passage for rigidly supporting said rod but adapted to permit axial adjustment of said rod.

7. A fastening device for an instrument comprising an elongate tubular body and a member movable in said tubular body having an axially adjustable rod projecting from one end of said tubular body, said fastening device comprising a piece of sheet metal bent to provide a base adapted to be attached to a support and spaced arms extending substantially at right angles from said base for engaging the ends of said tubular body to mount said tubular body in substantially parallel relation to said support, one of said arms having a socket for receiving an end of said tubular body in secured relation therewith, said socket having a passage for said rod on said movable member and a pair of spaced tongues adjacent said passage defining gripping elements for rigidly supporting said rod but adapted to permit axial adjustment of said rod.

8. A fastening device for an instrument comprising an elongate tubular body and a member movable in said tubular body having an axially adjustable rod projecting from one end of said tubular body, said fastening device comprising a piece of sheet metal bent to provide a base adapted to be attached to a support and spaced arms extending substantially at right angles from said base for engaging the ends of said tubular body to mount said tubular body in substantially parallel relation to said support, one of said arms having an inwardly projecting boss receivable in the adjacent end of said tubular body in secured relation therewith, the other of said arms having a socket for receiving the adjacent end of said tubular body in secured relation therewith, said socket having a passage for said rod on said movable member and gripping

elements adjacent said passage for rigidly supporting said rod but adapted to permit axial adjustment of said rod.

9. A fastening device for an instrument comprising an elongate tubular body and a member movable in said tubular body having an axially adjustable rod projecting from one end of said tubular body, said fastening device comprising a piece of sheet metal bent to provide a base adapted to be attached to a support and spaced arms extending substantially at right angles from said base for engaging the ends of said tubular body to mount said tubular body in substantially parallel relation to said support, one of said arms having an inwardly projecting boss receivable in an end of said tubular body in secured relation therewith, the other of said arms having a socket for receiving the adjacent end of said tubular body in secured relation therewith, said socket having a passage for said rod on said movable member and a pair of spaced tongues adjacent said passage defining gripping elements for rigidly supporting said rod but adapted to permit axial adjustment of said rod.

10. A fastening device for an instrument comprising an elongate tubular body and a member movable in said tubular body having an axially adjustable rod projecting from one end of said tubular body, said fastening device comprising a piece of sheet metal bent to provide a base adapted to be attached to a support and spaced arms extending substantially at right angles from said base for engaging the ends of said tubular body to mount said tubular body in substantially parallel relation to said support, one of said arms having an inwardly projecting boss receivable in one end of said tubular body in secured relation therewith, and an element provided from the material of said arm and bent inwardly to define an anchoring tab adapted to embed in said tubular body in cooperation with said boss when positioned in the end of said tubular body, the other of said arms having a socket for receiving the other end of said tubular body in secured relation therewith, the latter arm having a cutout defining an opening leading to a passage in said socket for said rod on said movable member, and a pair of spaced tongues adjacent said passage defining gripping elements for rigidly supporting said rod but adapted to permit axial adjustment of said rod.

11. An instrument mounting for an instrument comprising a tubular instrument body and a movable member in said tubular instrument body having an axially adjustable rod projecting from one end of said tubular instrument body, said mounting for the instrument comprising a support and a fastening device comprising a piece of sheet metal providing a base attached to said support and a pair of arms extending substantially at right angles from said base, said arms engaging the ends of said tubular instrument body and mounting said tubular instrument body in substantially parallel relation to said support, one of said arms having gripping elements rigidly supporting said rod but adapted to permit axial adjustment of said rod.

12. An instrument mounting for an instrument comprising a tubular instrument body and a movable member in said tubular instrument body having an axially adjustable rod projecting from one end of said tubular instrument body, said mounting for the instrument comprising a support and a fastening device comprising a piece of sheet metal providing a base attached to said support and a pair of arms extending substantially at right angles from said base, said arms engaging the ends of said tubular instrument body and mounting said tubular instrument body in substantially parallel relation to said support, one of said arms having a passage receiving said rod and tongues adjacent said passage defining gripping elements rigidly supporting said rod but adapted to permit axial adjustment of said rod.

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