Feb. 3, 1953 G. A. TINNERMAN 2,627,385

SUPPORT

Filed Aug. 29, 1949

Fig. 1.

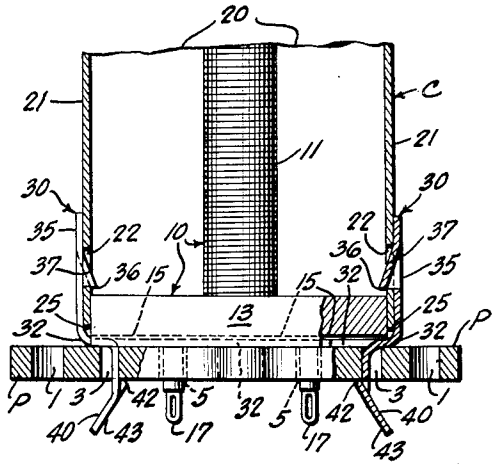
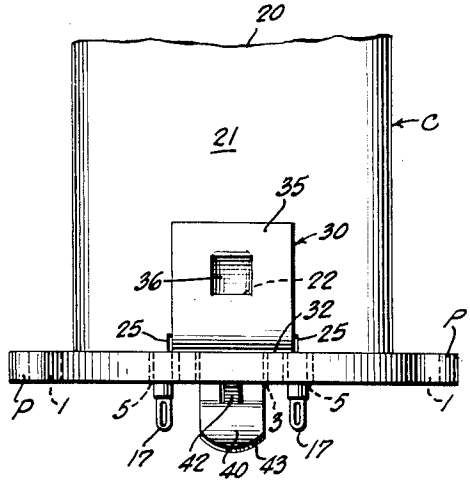


Fig. 2.



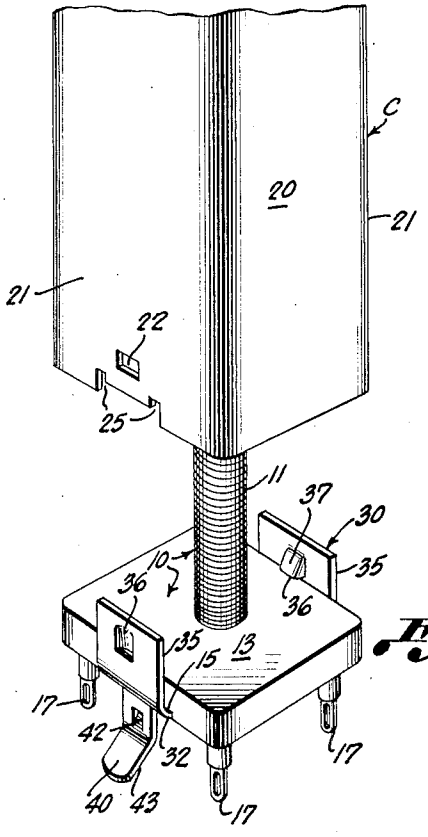


Fig. 3.

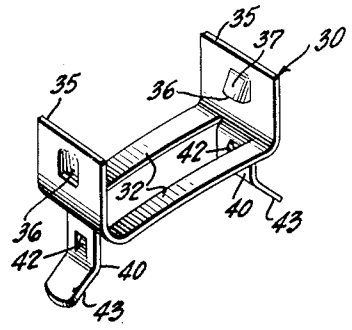


Fig. 4.

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SUPPORT

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7 Claims. (Cl. 248—27)

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This invention relates to improvements in fasteners and fastening installations which are used in the manufacture of radio apparatus, and the like, to provide a support or mounting for an electrical unit together with a removable mounting for a shield or casing enclosing the electrical unit. The invention is disclosed in connection with the mounting or supporting means for an electrical unit such as is used in radio and similar apparatus, but it will be understood that the invention is not so limited and is adapted for a wide range and variety of other applications and uses for supporting or mounting any instrument or other article in an assembly together with a shield, casing or housing for any such instrument or other article.

In the construction of radio apparatus, for example, there is usually provided a metal chassis which supports various components of the apparatus together with removable shields enclosing such components. The fastening constructions heretofore employed for such assemblies have been relatively complicated, expensive and difficult to manipulate, and, one of the primary objects of this invention is for the provision of an improved, simplified and inexpensive clip fastener and fastening arrangement of this character which provides a combined mounting of the electrical unit or other instrument and the shield or casing therefor together with suitable provision for easily and quickly removing the shield whenever necessary for servicing or repair purposes.

Another object of the invention is to provide such a fastener and fastening installation which, in a completed assembly, provides both a removable mounting for an instrument shield or the like, and also, a firm and rigid mounting of the electrical unit or other instrument contained within the shield.

Further objects and advantages, and other new and useful features in the construction, arrangement and general combination of parts of 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 fragmentary vertical sectional view illustrating a combined mounting in accordance with the invention which comprises a mounting or supporting means for an electrical unit, shown partly in elevation, and a removable mounting for the associated shield enclosing said unit;

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Fig. 2 is a side elevational view of the assembly shown in Fig. 1;

Fig. 3 is a perspective view of the improved clip fastener per se; and,

Fig. 4 is a fragmentary perspective view showing the improved clip fastener as assembled with the base of an electrical instrument prior to the mounting thereof in an installation, and with the associated shield in position to be secured by the clip in the completed assembly.

Referring now, more particularly, to the drawings, Figs. 1 and 2 illustrate the invention as employed to provide a combined mounting for an electrical unit, designated generally **10**, and its associated shield C, in assembled relation on a supporting part P. The arrangement is such that the electrical unit **10** is firmly and rigidly retained in mounted position on the supporting part P while the shield C is releasably secured in a manner whereby said shield may be easily and quickly removed for servicing or repair purposes.

The part P may be any suitable supporting plate or panel member in the radio or other apparatus and in the present example, is shown as provided in the form of an adapter plate which, in turn, is secured to the radio apparatus in any selected manner as by bolts, screws or rivets applied through apertures **1** provided in said supporting plate. In a similar manner, the supporting part P may be provided just as well by an apertured plate or panel portion of the chassis or frame of the radio or other apparatus. The supporting part P is formed with a pair of spaced slots or openings **3** for receiving the legs or shank members of a clip fastener **30** which provides the securing means for the combined mounting, as presently to be described. The supporting part P otherwise is provided with suitable spaced holes **5** for receiving the contacts, terminals or other elements of an electrical unit or other instrument **10** to be mounted on the supporting plate P.

In the present example, the electrical unit **10** is shown as comprising a coil form **11** carried by an instrument base **13** which is provided on its underface with a transverse channel or groove **15** slightly wider than the cross-sectional width of the fastener **30** so that the central body portion **32** of the fastener is adapted to seat in said channel **15** substantially as shown in Figs. 1 and 4. The instrument base **13** is provided with suitable terminals or contacts **17** depending from the underface thereof and receivable in the correspondingly spaced holes **5** in the supporting plate P.

The shield C may be of any suitable character and usually is provided in the form of a metal tube or can 20 having an open lower end which is adapted to fit over said instrument base 13 and enclose the coil form 11 carried thereby in the manner of a protective casing or housing commonly known as a condenser can. Adjacent the open lower end of the shield, opposite sides 21 of the shield are provided with recesses 22 for engagement with snap fastening elements on the clip fastener 30. The adjoining open end portions of the shield are formed with cutouts 25 which clear the central body portion of said fastener 30, as shown in Fig. 2, so that the open end of the shield C may directly contact the supporting part P and rest firmly and rigidly thereon as secured in its applied mounted position.

It will be understood that the instrument base 13 may be the similar or equivalent base portion of any other instrument or article to be mounted in an assembly together with such a shield, housing, casing or other member C which is releasably secured over the instrument in a manner whereby said shield may be readily removed for servicing or repairing the instrument or other article.

In this regard, the preferred form of clip fastener 30, shown in Fig. 3, is particularly advantageous in that it is a simple one-piece device embodying all the securing means necessary to provide the combined mounting of the electrical unit 10 or other instrument or article and the associated shield or housing C. A further advantage resides in the fact that the clip fastener 30 is readily provided as a simple, inexpensive one-piece device which may be made of any suitable sheet metal, preferably spring metal or cold rolled metal having spring-like characteristics. The clip fastener 30 may be formed from various types of blanks but from a low cost quantity production standpoint is most advantageously provided from small generally rectangular blanks which may be readily stamped from standard sheet metal strip stock with little loss or waste of material.

The clip fastener shown in Fig. 3 is readily provided by stamping and bending such a blank into a general U-shape comprising a central body portion 32 intermediate a pair of resilient spaced spring arms 35 formed from the ends of the blank and provided with snap fastening elements in the form of button-like detents or projections 36 on the inner faces of said resilient spring arms 35. The arrangement is such that said arms 35 extend in the same general direction to one side of the fastener body 32 and have a slight spacing outwardly from the instrument base 13 so as to permit the side portions 21 of the shield C to be fitted onto said instrument base 13 inwardly of said arms 35, substantially as shown in Fig. 1. The detents or projections 36 on the inner faces of said spring arms 35 may be of form suitable for snap fastening engagement in the associated recesses 22 in the adjacent sides 21 of said shield C. In the present example, the snap fastening detents 36 are shown as provided by a small horizontal slit in each arm and the metal adjoining such a slit pressed inwardly as necessary for the edge of said inwardly pressed portion to define the desired snap fastening detent 36. Such detents 36 are advantageously formed with outwardly tapered portions 37 defining inclined guide surfaces which facilitate the application of the condenser shield C to fastening engagement with said detents 36 in the mounted position of said shield, as presently to be described.

The central body portion 32 of the clip also carries a pair of spaced spring legs or securing elements 40 extending therefrom in the opposite direction from the spring arms 35. Such securing elements 40 may be provided in various ways and in forming the same in the preferred construction shown in Fig. 3, the fastener body 32 is stamped with a pair of spaced longitudinal slits and a middle intersecting transverse slit to define a pair of strip like portions which are integral with the fastener body 32 adjacent the spring arms 35. These strip-like portions are bent downwardly from the fastener body 32 to define the desired spring legs or securing elements 40 having a spacing corresponding substantially to the slots or openings 3 in the supporting part P. Shoulders 42 are provided on said spring legs in suitable spaced relation from the fastener body 32 for engaging the adjacent corner portions of said slots or openings 3 in the part P at the underside thereof. In the preferred construction shown, such shoulders 42 are formed on each of the spring legs 40 by a partially slit portion defining a tongue which is bent inwardly out of the plane of the shank leg 40 as necessary for the extremity of said tongue to define the desired shoulder 42. The spring legs 40 otherwise preferably are bent to define outwardly flared guide portions 43 on the free ends thereof which facilitate the initial application and attachment of said spring legs 40 in the slots or openings 3 in the supporting part P.

The various parts described are easily and quickly assembled to complete the combined mounting of the instrument or other article 10 and the shield or housing C simply by applying the clip fastener 30 to attached position on the plate or other supporting part P, whereupon the base 13 of the instrument 10 is set in position over the central body portion 32 of the clip between the spring arms 35, and the shield or housing C then mounted over said instrument 10 by snap fastening engagement with the spring arms 35 of the clip. More particularly, the arrangement is such that in the attachment of the clip fastener 30 to the supporting part P, the spaced projecting spring legs 40 are inserted into the correspondingly spaced slots or openings 3 in said supporting part P, and the fastener manipulated as necessary to seat the central body portion 32 against said supporting part P. The outwardly flared guide portions 43 on the spring legs 40 facilitate such assembly of the fastener onto the supporting part P by causing a suitable outward flexing of said spring legs 40 as required to pass through said openings 3 to a position in which the shoulders 42 on said spring legs snap into abutting engagement with the lower marginal corner portions of the supporting part P adjacent said openings 3, substantially as shown in Fig. 1. In this relation, the central body portion 32 of the fastener is seated against the supporting part P and the adjoining portions of the spring legs 40 are in firm resilient bearing engagement with the adjacent inner walls of the openings 3 and thereby cooperate with the shoulders 42 to retain the clip fastener securely in attached position on the supporting part P.

The instrument or other article 10 is then assembled with the clip fastener 30 by positioning the base 13 thereof between the spring arms 35 of the clip and with the groove or channel 15 on the underface of said instrument base overlying

and receiving the central body portion 32 of the fastener. The instrument base 13, as thus straddled over the central body portion 32 of the fastener, seats in uniform close contact with the support P in a manner which insures a good connection and a firm, rigid mounting of the instrument 10 on the support P in the completed assembly.

The shield or housing C is then telescoped over the instrument 10 with the opposite side portions 21 thereof positioned to pass inside of the spring arms 35 of the clip fastener. As the leading ends of said side portions 21 of the shield slide against the tapered guide surfaces 37 on the detents 36, said spring arms 35 are caused to spread apart as necessary to permit the lower end of the shield to pass therebetween and fit over the instrument base 13 in the fully mounted position of said shield, as shown in Figs. 1 and 2. The lower end of the shield C as thus fitted onto the instrument base 13 in such fully mounted position, bears firmly and rigidly on the supporting part P and thereby provides a corresponding firm and rigid mounting of the instrument 10 in operative relation on the support P in the completed assembly. In this fully mounted position of the shield C, the recesses 22 in the side portions 21 of said shield are in line with the detents 36 on the spring arms 35, whereupon said detents 36 snap automatically into said recesses 22 to lock the shield C in the completed assembly. This locking arrangement, accordingly, locks both the shield C and the instrument 10 retained by said shield firmly and rigidly in operative relation on the support P, as aforesaid.

Removal of the shield C for any purpose is readily effected by applying a suitable tool to the spring arms 35 to wedge the same outwardly sufficiently to withdraw the detents 36 from the recesses 22 in the shield, whereupon said shield C may be slipped off of the instrument base 13 and out of engagement with the spring arms 35 as necessary to be removed from the assembly.

The clip fastener 30 preferably is constructed of relatively thin sheet metal the thickness of which is selected according to service requirements and the predetermined size of the parts of the assembly. The clip fastener 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 assemblies which are subject to extreme conditions of vibration. A cheap and highly effective clip fastener 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 a specific example, such example is intended as an illustration only inasmuch as it is quite apparent that various changes may be provided without departing from the spirit and scope of the invention.

What is claimed is:

1. A construction comprising a support, an article having a base resting on the upper surface of said support, a member fitting on said base and extending entirely above the upper surface of said support, and a fastener having a body portion positioned between said base and support, a spring arm projecting from one side of said body portion of the fastener and engaging said member, and a securing element projecting from the opposite side of said body portion of the fastener and engaging said support.

2. A construction comprising a support, an article having a base resting on the upper surface of said support, a member fitting on said base, said member extending entirely above the upper surface of said support and comprising spaced walls, and a fastener having a body portion positioned between said base and support, a pair of spring arms projecting from one side of said body portion of the fastener and engaging said spaced walls of said member, and a securing element projecting from the opposite side of said body portion of the fastener and engaging said support.

3. A construction comprising a support, an article having a base resting on the upper surface of said support, a member fitting on said base, said member extending entirely above the upper surface of said support and comprising spaced walls, and a fastener having a body portion positioned between said base and support, a pair of spring arms projecting from one side of said body portion of the fastener and engaging said spaced walls of said member, and a pair of securing elements projecting from the opposite side of said body portion of the fastener and engaging said support.

4. A construction comprising a support having spaced openings, an article having a base resting on the upper surface of said support, a member fitting on said base, said member extending entirely above the upper surface of said support and comprising spaced walls, and a fastener comprising a piece of sheet metal bent to define a body portion positioned between said base and said support, a pair of spring arms projecting from one side of said body portion of the fastener and engaging said spaced walls of said member, and a pair of spaced spring legs projecting from the opposite side of said body portion of the fastener and secured in said spaced openings in the support.

5. A construction comprising a support having spaced openings, an article having a base resting on the upper surface of said support, a member fitting on said base and extending entirely above the upper surface of said support, said member comprising spaced walls provided with oppositely disposed recesses, and a fastener comprising a piece of sheet metal bent to define a body portion positioned between said base and said support, a pair of spring arms projecting from one side of said body portion and provided with detents received in said oppositely disposed recesses in said spaced walls of said member, and a pair of spaced spring legs projecting from the opposite side of said body portion of the fastener and provided with shoulders securing said spring legs in said spaced openings in the support.

6. A fastener comprising a narrow strip of sheet metal bent to provide a body portion for seating on a support and spring arms formed from the ends of said strip and projecting in the same general direction to one side of said body portion for securing an object on said support, and a pair of spaced spring legs provided from the material of said body portion by a pair of spaced lengthwise slits intersected by a transverse slit forming said spring legs with free ends and integral with said body portion adjacent said spring arms, said spring legs being bent to project in the opposite direction from said spring arms for fastening engagement with said support below said body portion of the fastener.

7. A fastener comprising a narrow strip of sheet metal bent to provide a body portion for seating on a support and spring arms formed from the ends of said strip and projecting in the same general direction to one side of said body portion for securing an object on said support, and a pair of spaced spring legs provided from the material of said body portion by a pair of spaced lengthwise slits intersected by a transverse slit forming said spring legs with free ends and integral with said body portion adjacent said spring arms, said spring legs being bent to project in the opposite direction from said spring arms for fastening engagement with said support below said body portion of the fastener, said spring arms having detents on the inner faces thereof and said spring legs being provided with inwardly extending shoulders.

GEORGE A. TINNERMAN.

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