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INSTRUMENT CASE

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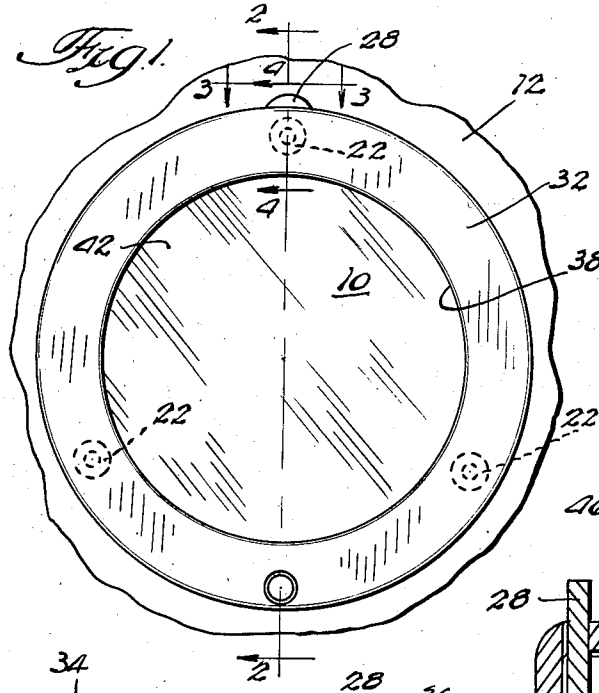


Fig. 1.

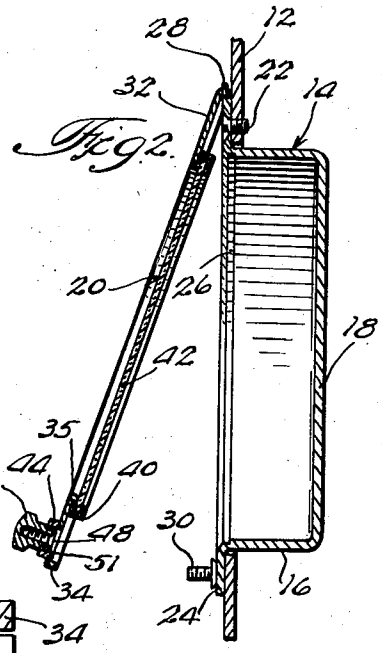


Fig. 2.

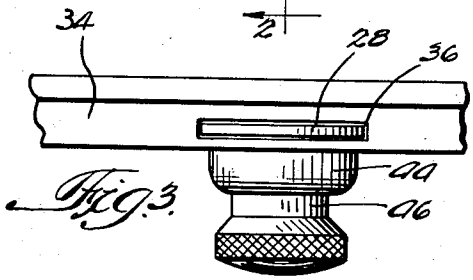


Fig. 3.

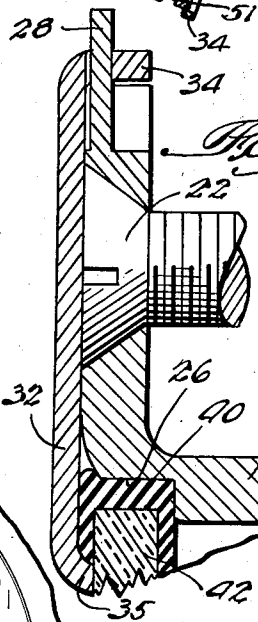


Fig. 4.

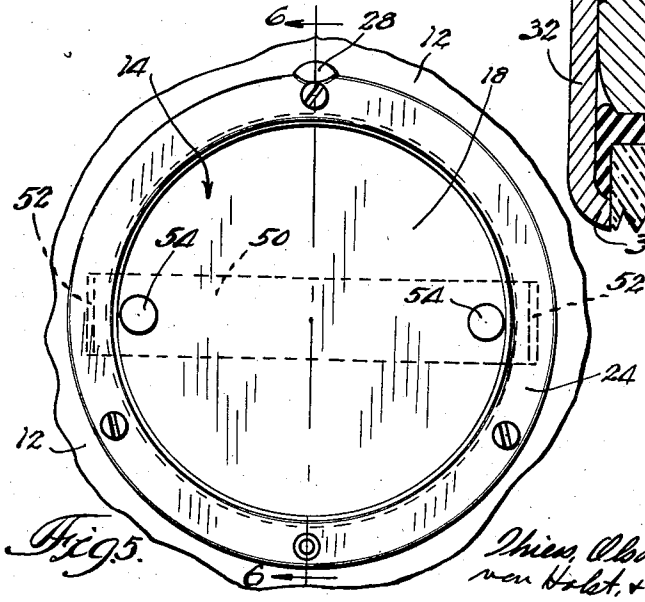


Fig. 5.

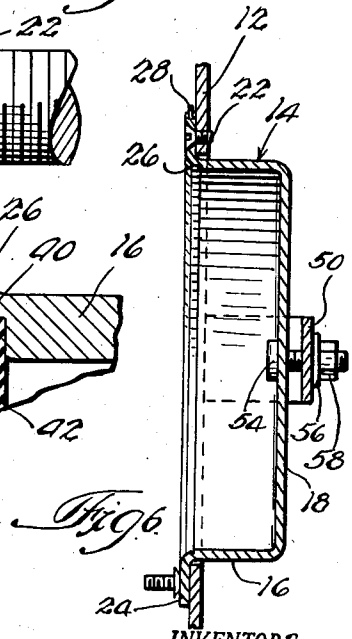


Fig. 6.

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INSTRUMENT CASE

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4 Claims. (Cl. 220—82)

This invention relates to an improved instrument case and more particularly to an improved case adapted for panel mounting whereby the instrument contained therein is readily accessible.

Modern technology requires the use of many indicating instruments for registering data on electrical, mechanical and hydraulic phenomena. The conventional method of mounting electronic equipment for example involves the positioning of the various electronic components on horizontal racks with vertical front panels concealing and protecting the equipment and providing a mounting position for various controls and instruments. In mounting instruments on such panels it is desirable that the instruments be accessible from the front of the panel whereby the mechanism of the instrument may be adjusted, calibrated, serviced or replaced. Conventional instrument cases do not provide ready access to the internal workings of the instrument, but require a complex removal procedure involving substantial lost time, hazard to the instrument, loss of various loose parts, and the like.

It is therefore one important object of this invention to provide an improved instrument case whereby the instrument may be removed therefrom readily and without danger of damage thereto.

It is another object of this invention to provide an improved instrument case for mounting on a panel in which the instrument contained therein may be removed from the case through the front of said panel.

It is still another object of this invention to provide an improved instrument case which is sealed against atmospheric conditions while providing means for ready accessibility to the instrument contained therein.

It is still a further object of this invention to provide an improved instrument case which is small and shallow and has means permitting ready removal and replacement of the transparent window forming a part thereof.

It is still another object of this invention to provide an improved instrument case adapted for substantially flush mounting on an instrument panel wherein the transparent window of said instrument case is removable as a unit without the use of any loose or detachable parts.

It is still a further object of this invention to provide an improved cover for an instrument panel comprising an intergral ring, gasket, and transparent window.

Further and additional objects of this invention will become manifest from a consideration of this specification, the accompanying drawing and the appended claims.

In one form of this invention an instrument case is provided comprising a cylindrical housing having an outwardly extending flange engageable with a vertical panel and a closure for said housing comprising a ring detachably engageable with said flange, a rubber gasket secured to the inner periphery of said ring, and a transparent window resiliently maintained in said gasket and substantially covering an opening in said housing.

For a more complete understanding of this invention, reference will now be made to the accompanying drawings, wherein:

Figure 1 is a fragmentary view of a panel illustrating one instrument case constructed in accordance with this invention mounted thereon;

Fig. 2 is a transverse sectional view of the embodiment of Fig. 1 taken on the line 2—2 thereof with the cover angularly disposed;

Fig. 3 is a fragmentary view of the embodiment of Fig. 1 taken on the line 3—3 thereof;

Fig. 4 is an enlarged sectional view of a portion of the embodiment of Fig. 1 taken on the line 4—4 thereof;

Fig. 5 illustrates the housing forming a part of the embodiment of Fig. 1 and including an auxiliary mounting bracket; and

Fig. 6 is a transverse sectional view of the housing illustrated in Fig. 5 taken on the line 6—6 thereof.

Referring now to the drawings and more particularly to Figs. 1 and 2, an instrument case 10 constructed in accordance with this invention is illustrated mounted on a vertical panel 12. The instrument case 10 comprises basically a housing 14 having a circular cylindrical side wall 16, an end wall 18, a flange 24, and a cover 20 covering the opening end of cylindrical housing 14. While the instrument case 10 is here illustrated as a relative shallow round enclosure it will be clear that the precise size and shape of the case will be determined by the instrument to be received therein and that the teaching of this invention is equally applicable to any instrument case.

The housing 14 is mounted in a circular aperture in the panel 12 by a plurality of machine screws 22 which pass through countersunk apertures in flange 24 and are received in small threaded holes adjacent to the main aperture in the panel 12. The side wall 16 of the housing 14 is provided with a circular recess 26 adjacent to the outwardly extending flange 24. The flange 24 is provided at one point about its outer periphery with a small lug 28, and at a point diametrically opposed to the lug 28 a threaded stud 30 is secured to the flange 24.

The cover 20 is provided with an annular ring 32 having a small lip 34 formed about the outer edge thereof and a small turned edge 35 along the inner periphery thereof. The lip 34 encloses the flange 24 of housing 14 when the cover 20 is in place and is provided with a small aperture 36 which receives the lug 28 formed in flange 24. The ring 32 has a central circular aperture 38 therein, and a small resilient gasket 40 having a channel shaped cross section is secured to the inner surface of ring 32 immediately adjacent the edge 35. The gasket 40 is cemented to the ring 32 in such a manner that the channel formed therein is directed radially inward. Any appropriate cement may be used, or other securing means such as mechanical clips may be employed.

A circular transparent window 42 is forced into the channel 40 and maintained there resiliently by the channel material. Opposite the elongate aperture 36 a circular aperture is formed in the ring 32 to receive a mounting collar 44. The collar 44 has a central aperture through which a knob 46 passes, and the knob 46 has a threaded recess 48 therein which corresponds to the threaded stud 30 and is engageable therewith. The knob 46 is maintained on collar 44 by a snap ring 51 and the outer diameter of knob 46 is so selected that the knob is freely movable within the collar 44. Thereby the knob may be rotated and shifted slightly to properly align with and accommodate the threaded stud 30. Engagement of nut 46 with stud 30 draws the ring 32 inwardly over the flange 24 and forces the channel 40 into the recess 26 formed in housing 14. This engagement is clearly illustrated in Fig. 4. Therein it can be seen that the channel

40 is partially compressed between the wall 16 of housing 14 and the ring 32. The transparent window 42 is also engaged resiliently through the gasket 40 between the wall 16 and ring 32. Thus the transparent window 42, though readily removable when the cover 20 is in the position illustrated in Fig. 2, is positively locked against inadvertent removal when the ring 32 is in the position shown in Fig. 4.

While machine screws 22 will be appropriate for mounting the housing 14 on the panel 12 in most circumstances, it may be desirable in some instances to provide for mounting the housing from the rear of the panel. Such a mounting technique is illustrated in Figs. 5 and 6. A U-shaped bracket 50 spans the housing 14 and engages the panel 12 at points adjacent to the bracket legs 52. Two apertures are formed in the end 18 of housing 14 and corresponding apertures are formed in the bracket 50. Bolts 54 extend outwardly through the housing 14 and the bracket 50. A lock washer 56 and nut 58 are applied to each of the bolts 54 to draw the end wall 18 rearwardly toward the bracket 50 thus producing positive engagement between the flange 24 of housing 14 and the panel 12.

If it is desirable to produce a universally useful case appropriate apertures may be formed in the flange 24 to receive machine screws 22 and further apertures may be provided in the end wall 18 to mount the auxiliary bracket 50. In that event both the panel screws and the bracket described above may be used for mounting the case 10 on the panel 12, or either the machine screws 22 or bracket 50 may be used exclusively.

While the case 10 is herein illustrated as a sealed, flat walled enclosure it will be clear that certain openings and deformations may be necessary in the housing 14 to receive portions of the instrument contained therein and to provide communication for connecting wires, tubes, linkages or the like to associated external apparatus. All such openings may be provided with appropriate gaskets or seals.

Furthermore, while a threaded stud and rotatable threaded knob are illustrated for detachably securing the cover 20 in sealing engagement with the housing 14, it will be clear that various devices may be used such as wing nuts, snap fasteners, toggles and the like.

Various modifications of the described device will occur to one skilled in the art, for example while a glass window 42 has been employed in this embodiment, other materials such as plastics may be adapted for this use. Furthermore other means of mounting the entire case on the panel may occur to one skilled in the art, and these are believed clearly within the spirit and scope of this invention.

Without further elaboration, the foregoing will so fully explain the character of our invention that others may by applying current knowledge, readily adapt the same for use under varying conditions of service, while retaining certain features which may properly be said to constitute the essential items of novelty involved, which items are intended to be defined and secured to us by the following claims.

We claim:

1. An instrument case comprising a housing having an open end and an outwardly extending peripheral flange surrounding said open end; a removable cover for said open end comprising a ring overlying said flange, a resilient annular gasket having a channel-shaped cross-section, including a peripheral portion and two leg portions extending radially inward therefrom, one of said leg portions being secured directly to said ring, and a window having substantially transparent portions resiliently maintained within said resilient channel, the periphery of said window being between said leg portions and removable therefrom by distorting the other of said leg portions, and quickly detachable means securing said ring and said flange together in substantially overlying face-contacting relationship, the edge of said housing which defines said opening, comprising a shoulder against which the other leg of the gasket is clamped when the ring is secured over the flange whereby said window overlies said open end and the periphery of said window and said gasket are rigidly and sealingly entrapped between said ring and said flange.

2. The instrument case of claim 1, wherein said quickly detachable means comprises cooperating radially extending lug means and lug receiver means formed in adjacent portions of said flange and ring, and a manually operated lock means securing said ring and flange against relative movement, said lock means being substantially diametrically opposite said lug and lug receiver means.

3. The instrument case of claim 2, wherein said lock means comprises threaded means disposed on said flange substantially opposite said lug, and a manually rotatable threaded device mounted in said ring and engageable with said threaded means, thereby securing said ring and said flange in abutting relationship with said gasket and window compressed therebetween.

4. The instrument case of claim 1, wherein said housing has an annular recess formed at said open end, said recess having a diameter and axial length such that said gasket is received therein, and the gasket and peripheral portion of the window are compressed between said ring and a radial annular wall of said recess.

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