

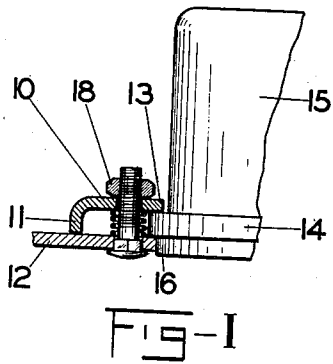
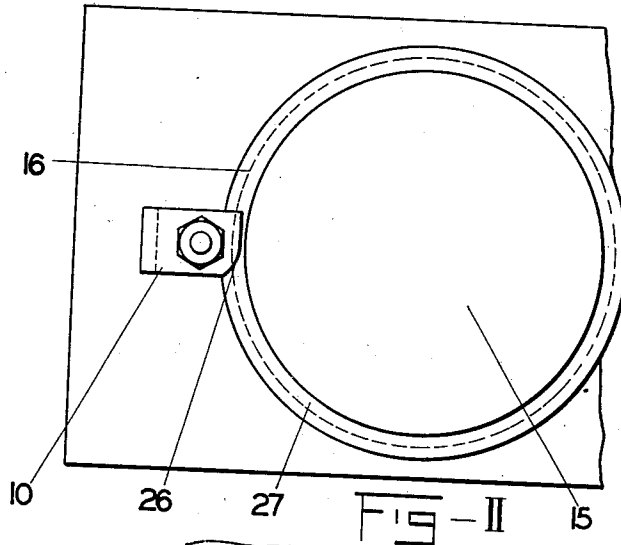
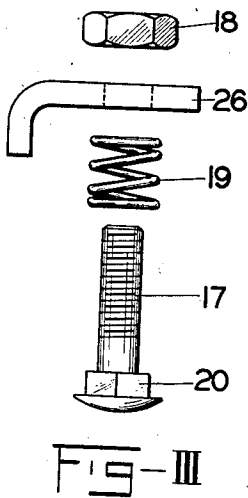
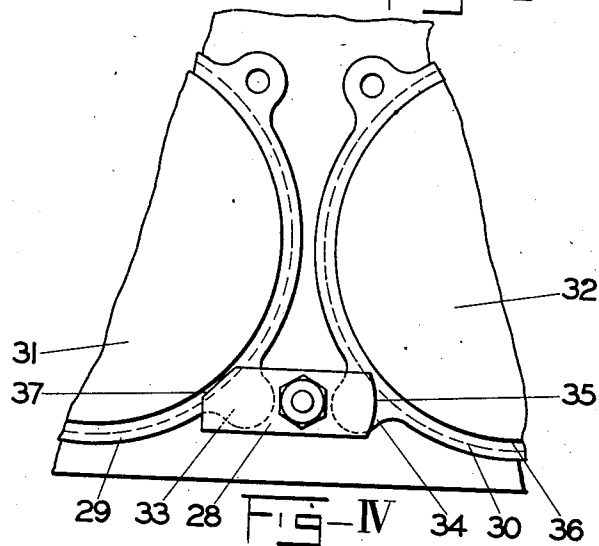
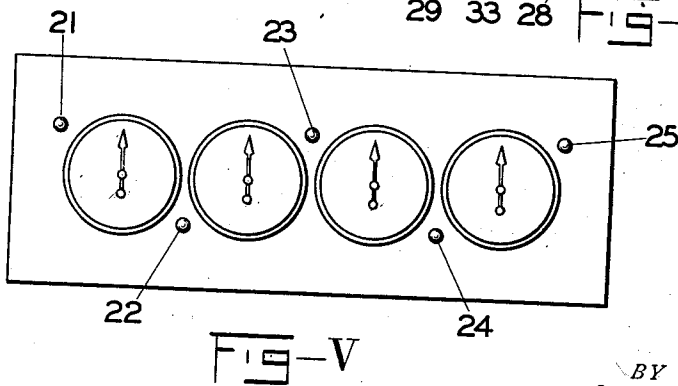
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CLAMP FOR PANEL INSTRUMENTS

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CLAMP FOR PANEL INSTRUMENTS

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This invention relates to clamps for panel instruments.

Many instruments are, by common practice, mounted upon a panel or instrument board at the rear of the panel and project through, or may be viewed through, an aperture in the panel. Instruments have been supported in such apertures by clamps engaging a ring or other projection extending from each instrument and abutting the rear side of the panel. Various forms of clamps have been suggested by which the projection or ring is held firmly in place against the panel, but of those changes with which I am familiar, difficulty is experienced in every instance where an instrument is to be removed from a panel upon which many instruments are mounted and especially when the panel is in place in the cock-pit of an airplane or even in an automobile.

This is so particularly in aircraft installations where space must be efficiently utilized and instruments are more or less crowded with the result that it is a task requiring perseverance and patience to remove and replace an instrument. The inaccessibility of the rear of the panel and the difficulty to be encountered in manipulating the usual clamps is the cause of waste of much of the time now required to effect replacement of an instrument and with these considerations in view I have developed a clamp which takes care of itself during a loosening operation and when loosened. Briefly, the clamping member or bridge which bears upon the projection or ring of an instrument is maintained in frictional contact with a rotatable member so that as the rotatable member is rotated to relieve the clamping force the bridge is rotated out of range of the projection or ring. After the instrument is freed the clamp is maintained in its last position from which it may be easily moved to its useful clamping position by rotation in a reverse direction.

Among the objects of my invention is to provide clamping means for panel instruments which requires but very little handling during removal and replacement of an instrument.

Another object is to provide a clamping member capable of maintaining the relation it is left in in respect to the panel upon which it is mounted.

Other objects and advantages will be pointed out hereinafter in the description which follows and in the claim.

In the drawings:

Fig. I is a sectional detail of a clamp in clamping relation with an instrument.

Fig. II is a view from the rear of a panel showing the clamp of Fig. I.

Fig. III is an exploded view of the clamp shown in Figs. I and II.

Fig. IV is a view from the rear of a panel showing a clamp embodying my invention modified so as to clamp two adjacent instruments.

Fig. V is a front view of a panel showing the use of five clamps to support four instruments.

The form of clamps illustrated in Figs. I, II and III has a bridge member 10 which has one end 11 turned over at an angle of 90° to form a leg by which that end of the bridge may be supported against the rear surface of panel 12. The other end 13, when the clamp is functioning to hold an instrument in place, rests upon a ring 14 or other projection extending from an instrument 15, as shown in Figs. I and II. Ring 14 which may be considered as a part of the instrument, abuts the rear surface of panel 12 and serves to fix the position of the instrument relatively to the panel while at the same time permitting the front of the instrument to extend into and through an aperture so that it may be viewed as readily seen in Fig. V. An edge of a panel aperture is illustrated at 16 in Figs. I and II.

In addition to bridge 10 the clamp includes a bolt 17, a nut 18 and a spring 19, the bolt having a non-rotatable head 20 which engages a similarly shaped hole in the panel, as shown in Fig. I. As may be clearly seen in Fig. I bolt 17 extends rearwardly and spring 19, which is mounted upon the shank of the bolt, is compressed between the panel and bridge when the bridge is functioning to hold an instrument in place. The bridge acts as a

beam supported at its ends with the result that a portion of the tension placed upon the bolt by the engaged position of nut 18 is caused to act directly upon an instrument's ring 14 and thereby hold the instrument in place. In practice a plurality of clamps would be used to hold each instrument and in Fig. V one arrangement utilizing five clamps 21, 22, 23, 24 and 25 for clamping four instruments in place, is shown.

Of course, when the clamp is effective to hold an instrument the compression of the spring is ineffective and the clamp does its duty the same as though no spring were present. However, upon a loosening up of the clamp the spring is effective to raise the bridge against the nut and to maintain the bridge in frictional contact with the nut. Accordingly, as the nut is rotated, during a loosening operation of the clamp, the bridge will be rotated with the nut by virtue of the frictional relation between the two members.

Having reference to Fig. II, which is a view from the rear of the clamp shown in Fig. I, it will be seen that a rounded edge 26 is provided for permitting the bridge to clear the wall 27 of the instrument as it is rotated counter clockwise (for a right handed screw). The width of the clamp is such as to clear the edge of ring 14 when it has been rotated 90°. Therefore, when each clamp holding an instrument has been rotated 90° by a corresponding rotation of its associated nut, the instrument may be removed. It will be apparent that in addition to reducing the amount of handling formerly required the operation just described, it is characteristic of the clamp that it will not of itself change the position in which it was last left; that is to say, the bolt may not wobble and possibly extend forwardly of the panel, the bridge may not by itself assume another position by rotation about the bolt nor be displaced axially of the bolt so as to interfere with the repositioning of an instrument. In fact, it remains just where it is last positioned and a mechanic may expect to find it in such a position and know just where to locate it even though he cannot see it.

Upon replacing an instrument, without first having had to readjust and hold at least two clamps out of interfering positions, the mechanic needs only to locate the nuts of the clamps and rotate such clockwise, Fig. II, until the bridge is brought firmly into contact with the ring of the instrument. The initial rotation (of approximately 90°) carries the bridge with the nut to its clamping position, Figs. I and II, and thereafter, subsequent rotation causes the clamp to seize and hold the instrument in mounted position.

In Fig. IV I have illustrated another form of clamp which is operable in the manner described and possesses characteristics common to the clamp shown in Figs. I and II. This

clamp has a bolt 17, nut 18 and spring 19, but the bridge 28 is a bar or strip of uniform cross-section across its narrow dimension and it is designed to act upon two instruments at once. The ends of the bar 28 are supported by rings 29, 30 of respective instruments 31, 32 and it is preferable to also provide projections 33, 34 for better support. While bar 28 might have forms and proportions, other than those illustrated in Fig. IV, I prefer to round one end of the bar at 35 so as to clear wall 36 of instrument 32 during a clamp relieving operation and to make a diagonal cut 37 at the other end so as to permit the use of the clamp between closely positioned instruments while at the same time providing an abundance of footing for supporting that end of the bar.

The two forms of clamp are particularly useful since their use enables the total number of clamps necessary for a particular installation to be maintained a minimum. For example, instead of using eight or more individual clamps similar to the form illustrated in Fig. I to hold four instruments in place, judicious selection of clamps of the two forms disclosed enables the use of two individual clamps at 21 and 25 and three double acting clamps at 22, 23 and 24, Fig. V. Not only is there a saving in the number of clamps necessary, but it will be appreciated that the highly desirable advantages hereinbefore referred to are the direct cause for reduction in costs of assembling as well as of costs incident to labor involved in removing and replacing an instrument once a panel or instrument board has been installed.

While I have disclosed two forms of clamp capable of fulfilling the objects primarily stated, I wish it to be understood that I contemplate changes and other modifications embodying the principle of my invention and coming within the scope of the appended claim. If neatness were not an almost indispensable requirement for the appearance of the front of a panel I would so fashion the screw-engaged relatively rotatable members as to make the rotatable member, i. e. the bolt or nut, accessible from the front of the panel so that the necessity of handling the similar member from the rear of the panel, as in the forms illustrated, would be eliminated.

I claim:

In a clamp for panel instruments, the combination of a bridge engageable with an instrument on each side of the clamp for holding two instruments in position on a panel, means engaging said bridge and engageable with the panel to which the instruments are to be clamped, said means including a rotatable member disposed on one side of the panel and in engagement with another member extending through the panel, the latter member having a portion adapted to engage the panel to prevent rotation of the second member

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when the first member is rotated, and resilient means for urging said bridge into frictional engagement with the rotatable member when the clamp is in use on a panel so that said bridge rotates with said member to clear the instruments when the member is initially rotated to loosen the clamp.

In testimony whereof I hereto affix my signature.

ADOLF URFER.