

Sept. 19, 1939.

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2,173,435

PANEL MOUNTING

Filed March 8, 1937

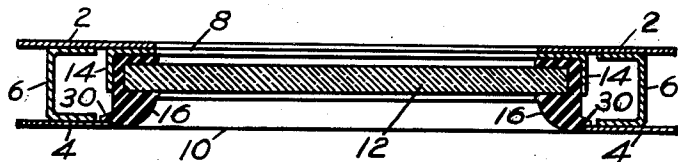


FIG. 2

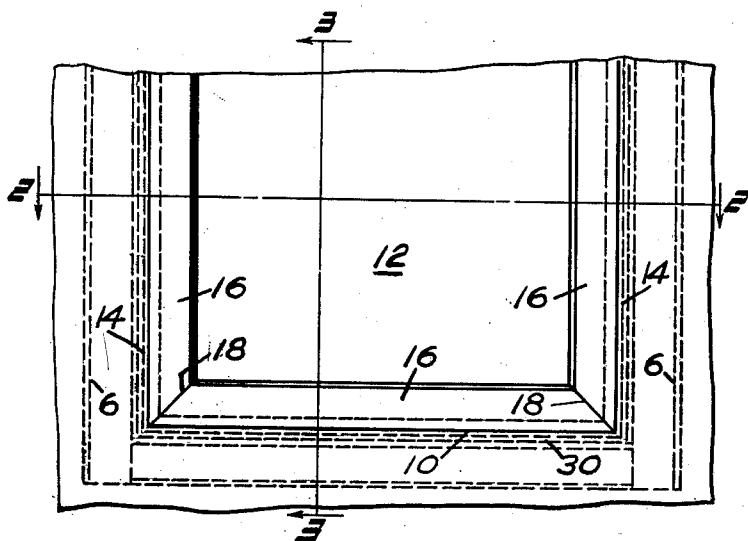


FIG. 1

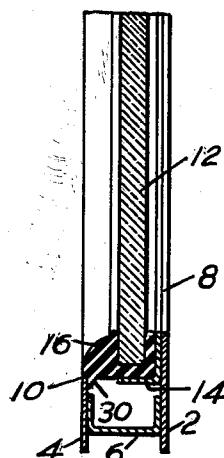


FIG. 3

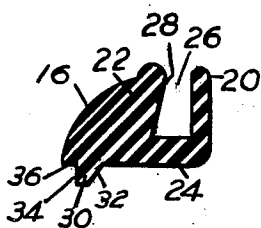


FIG. 4

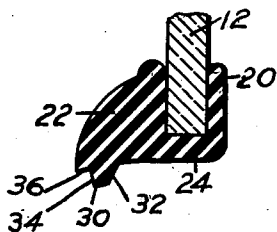


FIG. 5

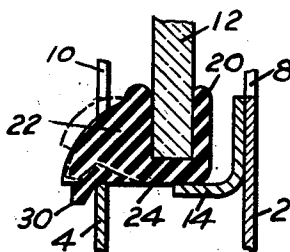


FIG. 6

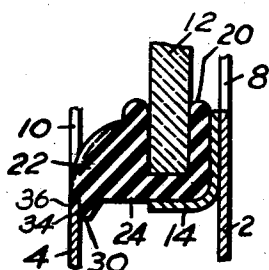


FIG. 7

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2,173,435

PANEL MOUNTING

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Application March 8, 1937, Serial No. 129,753

3 Claims. (Cl. 189-78)

This invention relates to improvements in panel mounting means and is particularly concerned with an improved panel retaining device adapted for use in connection with various kinds of structures which include panels and panel mountings.

Although my invention is by no means limited thereto it has particular utility when employed to secure panels, of glass or similar transparent material, over openings in frame structures, such as door or window frames, where it is desired to provide a dust and water tight joint between the panel and frame. Commonly such frame structures are constructed of sheet-metal thereby rendering the use of conventional securing means difficult, if not entirely impracticable. Furthermore, under certain operating conditions, as for example, in the automotive field, the structure is subjected to unusual shocks and jars, as well as to distorting stresses, which, if transmitted to the panel, would damage the same. It is equally important that the panel securing means be not only simple to construct and easy to apply but also neat and pleasing in appearance and dependable in use.

It is therefore a principal object of my invention to provide an improved type of panel mounting which securely holds and seals the panel member in place and at the same time cushions it from shocks or jars received by the frame structure as well as prevents the transmission of stresses, arising from distortion of the latter, to the panel.

It is also an object of my invention to provide an improved kind of panel retaining means which is simple to construct and readily applicable to the frame structure without additional securing means.

It is a still further object of my invention to provide an improved panel retaining means which not only presents a neat and pleasing appearance but also seals the joint between the panel and the frame structure against the passage of dust and/or water.

Another object of my invention is to provide a novel panel retaining member which surrounds the outer edge of the panel and resiliently supports the same on a frame structure and which is formed with a projecting portion designed to engage another portion of the frame so that the resilient character of the retaining member causes a positive locking action between the projecting portion and the latter portion of the frame.

It is a further object of my invention to provide a novel panel retaining means which is

adapted for use in various types of frame structures and in connection with panels of all shapes.

These and other objects will become apparent from the following detailed description of a preferred embodiment of my invention when considered in conjunction with the claims and the accompanying drawing, wherein:

Figure 1 is a front elevation of a portion of a frame structure embodying my improved panel mounting means;

Figure 2 is a sectional view of the structure of Figure 1 taken on the line 2-2;

Figure 3 is a further sectional view of Figure 1 taken on line 3-3, looking in the direction of the arrows;

Figure 4 is an enlarged transverse sectional view of my improved retaining element in its free or undistorted condition prior to assembly;

Figure 5 is a view similar to Figure 4 but showing the retaining element in a distorted condition produced when it is applied to the panel;

Figure 6 is a sectional view similar to that of Figure 4 showing a panel in an intermediate position while being installed in a frame member; and

Figure 7 is a view similar to Figure 6 showing the panel completely installed.

With continued reference to the drawing, wherein like reference characters are used to designate like parts wherever they appear throughout the several views, and referring first to Figures 1, 2 and 3, my improved panel mounting comprises a frame structure having spaced walls 2 and 4, which for convenience of discussion will be designated as "back" and "front" walls respectively. Walls 2 and 4 are secured in parallelism by channel members 6-6 so as to form a rectangular frame structure, which may be a door, window or any other type of wall member. Walls 2 and 4 are provided with aligned openings 8 and 10, the former of which is slightly smaller than the latter, and a panel 12 is arranged to close these combined openings by a mounting means now to be described.

As has just been noted, opening 10 is slightly larger than opening 8 which permits insertion of the panel 12 from the front side, and a rectangular assembly of angle members 14-14 is secured to wall 2 adjacent to opening 8 and in surrounding relation therewith. The extending flanges of members 14-14 form a shoulder projecting towards, but spaced from, wall 4 and substantially in alignment with the edge of opening 10. The members 14-14 may, of course, be former integrally with wall 2 by suitably bending back portions of the same adjacent to opening 8. Re-

resilient panel retaining strips or elements 16—16 receive the peripheral edges of panel 12 and these retaining elements are snugly seated on the shoulder formed by members 14—14 with projecting portions thereof engaging and resiliently pressed against the ledge formed by wall 4 to hold the panel securely in place in a manner about to be described.

Where the panel is rectangular these strips are mitered at the corners, as shown at 18; however, it will be readily understood that the retaining members 16—16 can be used with panels which are circular or oval in shape, or rectangular with rounded or arcuate corners. When used with panels of these types a single strip may be employed, cut to the proper length to entirely surround the panel.

Turning now to Figures 4 to 7 the construction of retaining elements 16—16 will be described. These elements are formed from a strip of resilient material such as rubber, which when distorted under pressure tends to return to its original shape. Spaced side walls 20 and 22, joined by a rear or bottom wall 24 form a channel-like recess 26 for receiving the edge of the panel. Preferably the strip is formed by molding so that in its normal undistorted condition the walls 20 and 22 assume the positions shown in Figure 4, with the wall 20 of recess 26 inclined towards wall 22. The width of recess 26 at its bottom is substantially equal to the thickness of the panel while the width in the upper portion is considerably less than said thickness. Thus when the several retaining elements are assembled on the edge of a panel they are each caused to assume the shape shown in Figure 5 with the outer portion of wall 24 slightly curved.

Carried by the wall 24 near the outer portion of wall 22 is a longitudinally extending projection 30 which is wider at its base than at its outer extremity, for a purpose to be later explained, and providing a sloping rear surface 32 and straight front surface 34. The front surface 34 is arranged at right angles to the outer portion 36 of wall 24.

The panel 12 is larger than opening 8 but considerably smaller than opening 10 and the thicknesses of walls 24 of strips 16—16 are preferably just sufficient to completely fill the space between the panel edges and the shoulder formed by members 14—14, (see Figures 3 and 7). However, panel 12 may be made a little undersize so that a slight clearance will be provided between its edges and the bottom of groove 26 to allow for small variations in the area bounded by the projecting flanges of members 14—14. In this connection it is noted that the resilient character of the elements 16—16 will in itself allow some degree of variation both in the size of the panel and in the area bounded by members 14—14.

In assembling a panel the several strips or retaining elements 16 are first fitted on the peripheral edges thereof and thus caused to take the shape shown in Figure 5. The panel, with the assembled elements 16—16, is now inserted through the opening 10 until portions of the outer surfaces of walls 24—24 rest on members 14—14. As has been previously noted, the shoulder formed by members 14—14 is aligned with the edge of wall 4, adjacent opening 10, thus the outer portions of elements 16—16, which are now bent or deformed, will not pass directly through opening 10. However, the resilient character of elements 16—16 permit them to be distorted in the other

direction (see dot and dash lines, Fig. 6) so that the panel and strips 16—16 can be moved into the position shown in Figure 7. With the distorting pressure released the members 16—16 tend to assume the position of Figure 5 and as the projections 30 are now caught or clinched under the ledge formed by wall 4, adjacent opening 10, the members 16—16 together with the panel 12 are securely locked to the frame structure.

A comparison of Figures 5 and 7 will show that when finally assembled the wall portion 22 is still slightly distorted and that, due to this distortion, illustrated by the dotted line in Figure 7, indicating the normal shape of the outer surface of wall 22, the surface 36 is forced firmly against the edge of wall 4. Also the distance between the outer surface of wall 20 and the surface 34 of projection 30 is slightly greater than the distance between the inside surface of wall 4 and the inside surfaces of the flange portions of members 14—14 which are parallel to the panel. Thus the panel is firmly gripped by the side walls of channels 26—26 and the surfaces 34 are pressed against the inner surface of wall 4. As has been previously noted the thicknesses of walls 24—24 are such that the same are snugly fitted between the shoulders formed by members 14—14 and the outer edge of the panel.

As will be readily observed the panel is resiliently supported in all directions and therefore completely insulated against shocks or strains arising in the frame structure. Furthermore, the distorted condition of the wall portions 22 securely holds the projections 30 in locking relation with walls 4—4. It should also be noted that a force exerted on the panel tending to move the same to the left, as viewed in Figures 3 to 7, will more firmly force the surfaces 34 and 36 into engagement with walls 4—4. As the edge of the panel is above the edge of wall 4 such a force tends to further distort walls 22, which results in increased pressure at the surfaces 34 and 36, thereby still more effectively locking the projections 30—30 under the walls 4—4.

The sloping surfaces 32—32 of projections 30—30 provide a certain degree of increased flexibility adjacent the outer portions of these projections which assists in the assembling operation while at the same time a considerable area of rubber is arranged to resist shearing stresses tending to tear these projecting portions away from the walls 22—22.

As the walls 24—24 are firmly secured between the edges of the panel and the extending flanges of members 14—14 with walls 20—20 likewise held between the back face of the panel and the frame structure, it is practically impossible to remove the elements 16—16 except by distorting the same to the position shown in Figure 6 and moving the whole panel assembly out through opening 10. As previously noted, a force on the panel directed towards opening 10 merely enhances the locking or holding action of the projecting portions 30—30 and due to the thickened base portions of projections 30—30 a very great force would be required to shear the same from the walls 22—22. Such a force would never be encountered under ordinary conditions of use and hence no securing means, in addition to the strips 16—16, are necessary. However, if additional security is for any reason desired, the same may be provided simply by placing conventional corner clips over the mitered ends of strips 16—16 and securing such clips directly to the frame structure.

From the foregoing it is seen that I have provided and improved panel mounting means which is simple in form, easy to apply and neat in appearance. My improved mounting means securely holds the panel in place against accidental displacement without the use of additional securing means and at the same time resiliently supports the panel on the frame structure so that shocks and/or stresses are not transmitted thereto. Furthermore, an effective seal is provided between the panel and the frame structure. Due to the slightly distorted condition of the panel retaining strips when in assembled position they will not loosen during use and the interlock between these strips and the frame structure is at all times maintained. My improved panel mounting means is adaptable for use with various types of panel shapes and supporting structures thereby providing a very effective device in the construction of paneled structures of all kinds.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. In a panel mounting, a frame comprising a wall member provided with an opening, a shoulder adjacent to and surrounding said opening, a panel covering said opening and having its edges spaced from said wall and said shoulder, a second wall member spaced from said shoulder and provided with an opening, the marginal edges of which are in alignment with said shoulder, panel retaining means comprising a strip of resilient material formed with a channel receiving the edges of said panel and wall portions spacing said edges from said walls and said shoulder, an enlarged convex solid section on said retaining means carrying a projection, said projection being clinched under the marginal edges of said second wall member

adjacent said opening with said enlarged section distorted from its normal shape so that said panel is firmly gripped by said retaining member and said projection is resiliently urged into clinching engagement with said marginal edges.

2. In a panel mounting, a frame including a wall member provided with an opening, means on said frame forming a shoulder adjacent to but spaced from the edges of said opening, a panel member, means on said frame providing a ledge aligned with and spaced from said shoulder, means for mounting said panel on said shoulder and over said opening, said means comprising a resilient channel element seated on said shoulder and entirely surrounding the edge of said panel, said channel element including a bottom wall and solid side-walls, one of said side walls being convex and thickened so as to extend said bottom wall beyond said ledge, a projection on said bottom wall extending outwardly therefrom and under said ledge, said resilient element being initially shaped so that the extended portion of said bottom wall and said projection are resiliently held in engagement with said ledge when said panel is assembled therein and said element is seated on said shoulder.

3. In a panel mounting, a frame comprising a wall provided with an opening, said opening being generally rectangular in shape, means providing a shoulder spaced from and surrounding said opening, a rectangular panel covering said opening and having its edges spaced from said shoulder, a plurality of channel shaped panel retaining strips having bevelled ends assembled on the edges of said panel with their bevelled ends meeting at the corners thereof and receiving the edges of said panel, each of said strips comprising a resilient member having an enlarged convex solid section carrying a projecting rib, means forming a ledge on said frame spaced from and aligned with said shoulder, said projecting ribs of said strips being clinched under said ledge with said enlarged portions distorted so that said projecting ribs are held in engagement with said ledge and said beveled ends are firmly pressed together.

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