Sept. 30, 1952 A. J. KIEFER 2,612,244

PANEL FASTENING FOR DOORS AND WINDOW SASHES

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Fig. 1

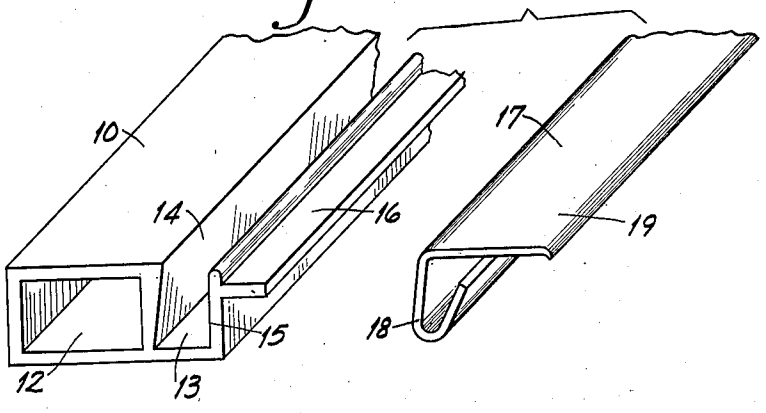


Fig. 2

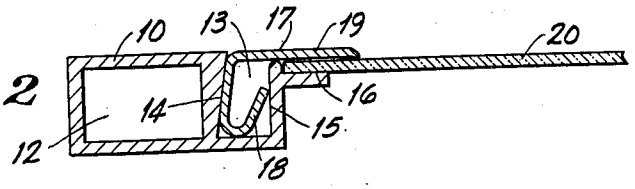


Fig. 3

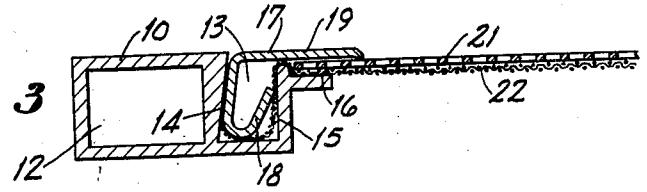
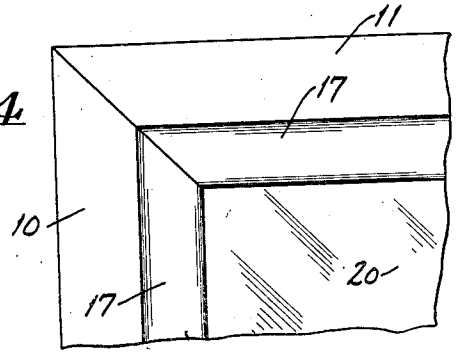


Fig. 4



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PANEL FASTENING FOR DOORS AND WINDOW SASHES

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2 Claims. (Cl. 189—78)

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This invention relates to novel means for detachably retaining in position in the open space of a door or window sash either a solid panel, such for instance as a pane of glass or other closure for use in cold weather, or a panel permitting the passage of air in warm weather, such as a screen or a guard, or both a screen and a guard.

For this purpose I provide such an open space in the door or sash with marginal members, such as stiles and rails, each of which is provided with a longitudinal groove formed on its outer surface and along its edge bordering the open space, the side walls of which groove diverge toward the bottom of the latter. The outer walls of each groove are integrally provided with a shelf extending inwardly of the open space, which shelves are positioned below the top edge of the outer wall of the groove a distance sufficient to receive and support the closure with the face or top surface of the latter in the plane of the outer surface of the marginal members. The frame, comprising the stiles and rails, is removably mounted in the space in the door or sash in any convenient manner.

To detachably hold the panel in its position I provide a spline of spring metal, such as tempered aluminum, in sheet form, which is sprung into the groove, said metal being cut into a narrow strip which is bent laterally to form a depending looped shaped body, the sides of which frictionally engage the sides of the groove and the inner edge of which frictionally engages the inner side wall of the groove to prevent accidental loosening of the spline from the groove.

The opposite or outer side of the looped body extends up above the top of the outer wall of the groove and is bent outwardly to form a skirt which overlies the shelf extending from the outer wall of the groove but is spaced from said shelf a distance equal to the thickness of the glass pane or other closure, thus locking the closure panel or panels in position, and to the marginal members.

The outer free edge of the skirt of the spline is preferably provided with an inturned edge which grips the closure panel and holds it tightly in position in the frame formed by the marginal members.

When warm weather approaches the marginal frame, formed by the stiles and rails, in which is mounted the glass or other closure, is removed from the door or sash, and a second frame in which the screen or guard and screen are mounted is substituted in its place. In the fall the substituted frame is removed and the first mentioned frame is substituted.

In the accompanying drawings, which are intended to present a practical embodiment of the principles of my present invention,

Fig. 1 is a disassembled perspective of a portion of a rail element of the frame of the opening, and also of the spline used therewith;

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Fig. 2 is a cross-sectional view of the stile assembled with the spline and employed to detachably mount a glass panel or other closure in place;

Fig. 3 is a similar view showing a guard and a screen held in place on the rail by the spline, and

Fig. 4 is a fragmental view showing one of the stiles and one of the bottom rails to which is shown attached a glass panel by means of my improved splines.

Referring to the drawings, 10 indicates one of the rails of the marginal frame, which frame defines the opening in the door or sash, and 11 in Fig. 4 indicates the bottom rail of the same. Both the stiles and the rails are preferably die-cast of a light non-corrosive metal such as aluminum and are hollow, as indicated at 12. Along the inner edges of each of the stiles and rails there is provided a groove 13, the inner wall 14 of which, adjacent the body of the stile or rail, diverges downwardly of the groove 13 toward the stile or rail, while the outer wall 15 of the groove may be vertical.

The free top edge of the outer wall 15 of the groove 13 is below the plane of the top or outer surfaces of the stiles and rails for a distance equal to the gauge of the metal of which the spline, later to be described, is formed. The numeral 16 indicates a flat relatively narrow shelf integrally extending from the outer wall 15 of the groove 13. The shelf 16 is set downwardly from the top free edge of the wall 15 a distance sufficient to receive the closure panel, such as glass, or screen, or a screen and guard, with its outer face in substantially the same plane as the top edge of the wall 15 of the groove.

The spline 17 is formed by bending up a sheet or plate of resilient metal, such as tempered aluminum, to form a longitudinal curved body loop 18, one edge of which is bent upwardly to frictionally engage the outer wall 15 of the groove and thus prevent accidental outward movement of the spline relative to the groove. The opposite wall of the loop of the spline extends upwardly in contact with the inner wall 14 of the groove to the level of the upper face of the stile 10 as shown in Figs. 1, 2 and 3, and said wall of the spline is bent outwardly to form a flat skirt 19 which extends at a right angle outwardly over the top edge of the wall 15 and overlays the marginal portion of the closure, which may be, as shown in Figs. 1 and 4, a pane of glass 20, or as shown in Fig. 3, a guard 21 overlying the screen 22.

When the screen 22 is to be mounted in the framed opening, its edge portions are bent to extend downwardly along the inside of the front wall 15 of the groove, beneath the loop of the groove, and thence part way up along the inner wall 14 of the groove.

The spline 17 is placed in position by forcing its looped body down into the groove 13, until, in case a screen is to be mounted in the framed opening, the portions of the screen in the groove will be forced down and held securely by the spline in the bottom of the groove, while the guard 21, overlying the screen 22, is clamped down on the screen and is in turn supported from below by the shelf 16 integral with the front wall 15 of the groove 13.

The splines 17 may be mitered at their extremities, so that the ends of the splines engaging the stiles may fit with the ends of the splines engaging the rails, as illustrated in Fig. 4.

In cases where the ends of the rails are cut at right angles and fit against the adjacent vertical edges of the rails, the grooves of the stiles are extended to connect with the grooves of the rails so that the ends of the splines may meet and fit together.

It is understood that the rails are fitted with grooves similar to that shown in the rails, to receive their splines, and thus secure all four edges of the closure to the corresponding marginal elements.

I claim:

1. In a door or window sash structure, the combination of a frame for the opening to receive a panel to span said opening, which frame is formed of stile and rail members joined at their ends to define said opening, each of said members being provided along its inner edge with a longitudinal groove parallel with said edge, the inner edge surfaces of said members being also provided with an integral relative narrow shelf which extends into said opening but is stepped back from the plane of the adjacent side surface of the frame, a distance substantially the thickness of the panel, and a spline formed by bending up a relative narrow strip of resilient sheet metal to form an open looped body portion arranged to be forced into said groove engaging both sides thereof, the longitudinal edge of said loop frictionally engaging the adjacent side wall of the groove to hold the spline in place and the opposite longitudinal edge portion of said spline being flat and extending inwardly of the opening of the frame to overlap and cover the edge portion of the panel, the outer surface of the overlapping portion of the spline lying in the plane of the side surfaces of said stile and rail members of the frame, the back of said loop functioning as a fulcrum to unseat the longitudinal edge of said loop when the spline is being removed from said groove.

2. In a door or window sash structure, the combination of a frame for the opening to receive a panel to span said opening, which frame is formed of stile and rail members joined at their ends to define said opening, each of said members being provided along its inner edge with a longitudinal groove parallel with said edge, said grooves having inwardly diverging walls, the inner edge surfaces of said members being also provided with an integral relative narrow shelf which extends into said opening but is stepped back from the plane of the adjacent side surface of the frame a distance substantially the thickness of the panel, and a spline formed by bending up a relative narrow strip of resilient sheet metal to form an open looped body portion arranged to be forced into said groove engaging both sides thereof, the longitudinal edge of said loop frictionally engaging the adjacent side wall of the groove to hold the spline in place and the opposite longitudinal edge portion of said spline being flat and extending inwardly of the opening of the frame to overlap and cover the edge portion of the panel, the outer surface of the overlapping portion of the spline lying in the plane of the side surfaces of said stile and rail members of the frame, the back of said loop functioning as a fulcrum to unseat the longitudinal edge of said loop when the spline is being removed from said groove.

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