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2,666,508

WINDOW SASH FRAME STRUCTURE

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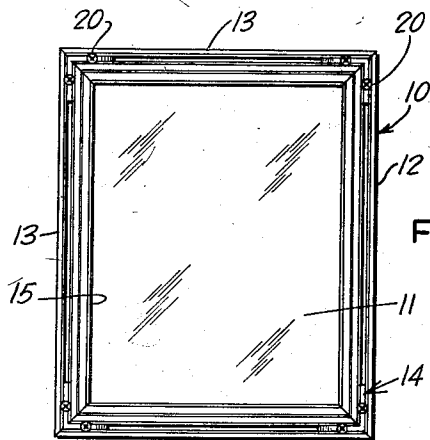


FIG. 1

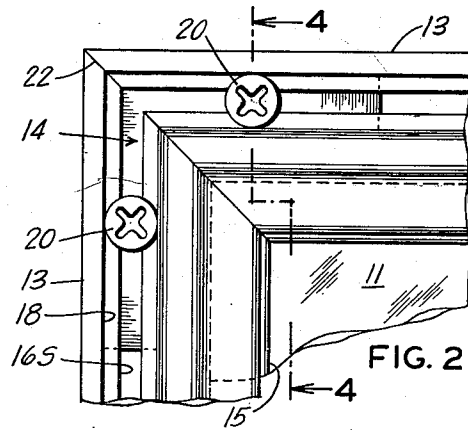


FIG. 2

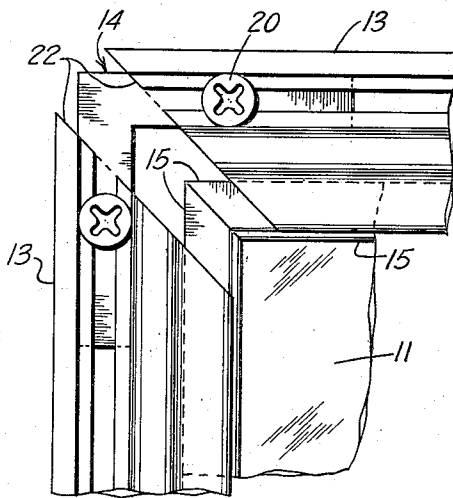


FIG. 3

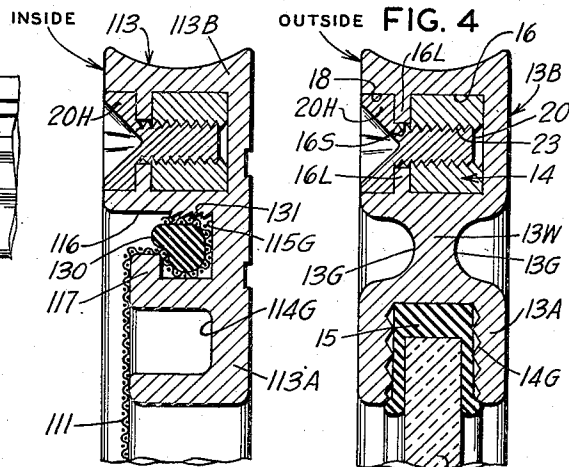


FIG. 4

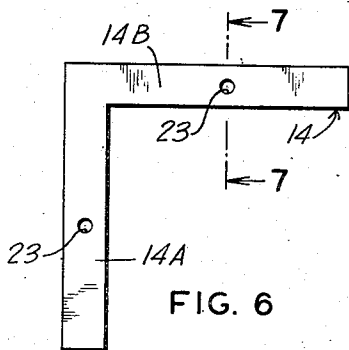


FIG. 5

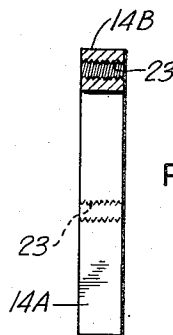


FIG. 6

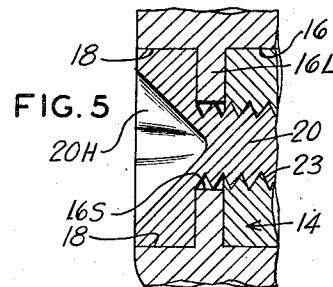


FIG. 7

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WINDOW SASH FRAME STRUCTURE

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Western Engineering Trust

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4 Claims. (Cl. 189—76)

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This invention relates to the manufacture and construction of window sash and particularly to such sash in which the frames are made from extruded metal members that are secured together at mitered joints at the corners of the sash.

It has been long customary to make metal framed sash, particularly as screens or storm sash, by the use of extruded metal frame elements that are secured together at mitered corners by means including corner brackets that extend along or into channels formed in the extruded frame elements. In making such sash it is of course desirable that the frame elements be so connected as to enable the elements to be separated when it is necessary to put new glass in the sash, and where provision has been made for such disassembly, such attachment or joining of the sash elements at the corners has been accomplished by forming bores through the metal members so that screws might be extended through such bores and into threaded engagement with the corner brackets, although in some instances, the threaded portion has been formed in the frame element and the attaching screw has been extended through a bore in the corner bracket. With either of such constructions, it has been necessary to accurately relate the screw receiving openings in the corner brackets and the frame elements, and this, of course, has introduced problems of cost which have been objectionable. In an effort to reduce costs, some manufacturers have resorted to peening of the sash elements or the corner brackets to effect the desired rigid connection therebetween, but this has, of course, made it almost impossible to disassemble the sash frame elements for glass replacement. It is, accordingly, an important object of the present invention to simplify the connection of metallic frame elements in sash of the aforesaid character, and to afford a simple connection that may be easily released for purposes such as glass replacement. A related object is to enable such joining of the frame elements to be accomplished in such a way that the formation of a screw receiving bore or threaded opening in the frame element is eliminated.

Other and related objects are to enable a fastening screw to be placed in an effective relation between a corner bracket and a frame element in such a way that an effective interlock is afforded between the screw and the frame element as an incident to the tightening of the screw.

More specifically, it is an object of the present invention to afford an extruded sash frame member in which an undercut channel is afforded into which the corner brackets may be extended or

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inserted from the ends of the frame elements, and to so form the overhanging portions of such slot that a fastening screw extended through the slot and into threaded engagement with the corner bracket may be tightened into engagement with such overhanging portions so as to interlock the screw against displacement endwise along the open edge of the slot. Another object is to enable sash frame elements to be prepared for shipment merely by performing the usual mitering operation at the ends of the sash frame elements, and a related object is to enable the fastening or securing operation to be performed merely by tightening screws that are carried by the corner bracket that is provided at each corner of the sash.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings, which, by way of illustration, show a preferred embodiment and the principles thereof and what I now consider to be the best mode in which I have contemplated applying those principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

Fig. 1 is an elevational view of the outer face of a storm sash constructed in accordance with the present invention;

Fig. 2 is an enlarged portion of Fig. 1;

Fig. 3 is a view similar to Fig. 2 and showing the way in which the frame elements are put in position with respect to the corner bracket and the glass panel;

Fig. 4 is a cross sectional view taken substantially along the line 4—4 of Fig. 2;

Fig. 5 is an enlarged portion of Fig. 4 showing the relationship of the fastening screw to the frame member and the corner bracket;

Fig. 6 is a front elevational view of the corner bracket;

Fig. 7 is a cross sectional view taken substantially along the line 7—7 of Fig. 6; and

Fig. 8 is a view similar to Fig. 4 and showing the invention as it is incorporated in a metal framed screen.

For purposes of disclosure, the invention is herein illustrated in Figs. 1 to 7 as embodied in a storm sash 10 having a glass pane 11 that is supported within a frame 12, such frame being formed from similar extruded metal frame ele-

ments 13. The frame elements 13 are enjoined or connected together by means including corner brackets 14. As will be evident in Fig. 4 of the drawings, the extruded metallic frame member 13 has an inner edge portion 13A and an outer edge portion 13B, and between these inner and outer edge portions, a pair of similar grooves 13G are formed so that such sections are joined by a relatively thin web portion 13W, this form being such as to afford adequate strength while at the same time conserving in material. The inner edge portion 13A is formed with a groove 14G into which the edge of glass panel 11 is adapted to be inserted, and this groove 14G in the present case is so formed as to afford space to receive a cushioning and sealing member 15 that is of generally U-shaped form and is made from a resilient material such as rubber so that it may embrace the edge of the glass pane and fit snugly into the glass receiving groove 14G.

The outer edge portion 13B of the frame member 13 is formed with a generally rectangular channel 16 that opens laterally through the outer face 17 of the frame element 13, and in this outer face, a slot 16S is formed, as will be evident in Fig. 2 of the drawings. This slot at its inner face, opens into the groove 16 in a substantially symmetrical relationship with respect to the opposite side walls of the groove 16, and thus overhanging lips 16L are formed. The lips 16L are formed with rabbetted grooves 18, as will be evident in Fig. 5 of the drawings, and the space within and between these two rabbetted grooves 18 is related, as will hereinafter be described, to the form and size of the head 20H of attachment screws 20 that are utilized to cooperate with the corner brackets 14.

The corner brackets 14 are formed with two right angularly related arms 14A and 14B, and each of these arms, as will be evident in Figs. 4 and 7, is of a rectangular cross section that is complementary to the form of the groove or slot 16 so that the arms of the corner brackets may be extended into such grooves 16 as shown in Figs. 3 and 4. In this connection it will be noted that the adjacent ends of the frame elements 13 are mitered as at 22 so that these mitered edges may be engaged when the frame elements are placed in the desired right angle relationship. The corner bracket 14 may thus be inserted into the open ends of the grooves 16, as shown in Fig. 3, and the screws 20 are arranged to be extended through the open slot 16S and into threaded engagement with bores 23 formed in the respective arms of the corner bracket. The head 20H of each screw is in the present case in the form of a Phillips head screw, and the head is cylindrical in form and with a flat bottom surface so that the head 20H may be fully received within the clearance space afforded by the grooves 18. The screws 20 may thus be termed binder-head screws. The arrangement is such that the screw head 20H may be drawn inwardly so as to be flush with or somewhat below the outer face 17 of the frame element, and as the screw 20 is drawn into this relationship, the flat lower surface of the screw head 20H is clamped against the flat and coplanar surfaces of the overhanging portions 16L, as will be evident in Fig. 5 of the drawings, and this produces an interlocking action between the screw head and the frame element so that the corner bracket 14 is fixed against displacement longitudinally with respect to the frame element 13.

It will be evident, of course, that this mode of

connecting the frame elements may also be applied to metallic frame elements that are to be used in producing screens, and in Fig. 8 of the drawings, such an arrangement is shown. Thus, in Fig. 8 the metallic frame element is identified as 113, and this frame element has an outer portion 113B that is the same as the outer portion 13B of Fig. 4. The frame element 113, however, has an inner portion 113A that is formed with a laterally opening channel 114G that is afforded merely to reduce weight while at the same time affording a frame element that is of the same width as the frame element 13. Between the groove 114G and the section 113B, an outwardly opening groove 115G is formed, and this opening has a slot 116 and an overhanging ledge 117. This groove 115G is arranged to receive the edge portion of a screen panel 111, such screen panel being forced into the groove 115G by a resilient retaining member 130 that is forced into the groove through the slot 116. Within the groove 115G, a series of teeth 131 are afforded to interlock with edge portions of the screen 111 to prevent undesired movement of the screen in relation to the frame element 113.

Through the use of the present invention, the extruded metal members, such as the member 13, may be formed from a relatively soft metal such as aluminum, and in preparation of the frame elements of the desired size for a particular sash, it is merely necessary to perform the mitering operations which afford the mitered ends 22, and these frame elements may then be assembled merely by association of the corner brackets and screw elements therewith, it being unnecessary under the present invention to perform any boring or other forming operations on the mitered sash frame elements. When the frame elements have thus been associated in accordance with the present invention, it is possible to detach such frame elements for replacement of the glass or screen panel, and this may be accomplished through the use of ordinary tools.

From the foregoing description it will be apparent that the present invention affords an improved and more advantageous way of manufacturing and assembling metal frame window sash or screens, and it will also be apparent that the extruded metal frame element that is afforded by the present invention is of such a form and character as to be adapted for interlocking engagement with a fastening element such as a screw, merely as an incident to the tightening of the screw, thereby to eliminate costly forming or boring operations such as those that have been required under prior practice.

Thus, while I have illustrated and described the preferred embodiment of my invention, it is to be understood that this is capable of variation and modification, and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. In a frame, a plurality of side frame members having mitered ends and of similar cross section affording an undercut groove opening through one side face of each member and having its open side defined by rabbetted grooves affording clamping ledges, corner brackets extended into said undercut grooves from the mitered ends of said members, and binder-head securing screws having the bottom surfaces of the

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heads disposed in planes perpendicular to the respective axes of such screws and said binder head screws being extended through the open sides of said undercut grooves and threaded into said corner brackets to engage said ledges and clamp the same between the screw head and the bracket to thereby interlock said corner brackets against endwise displacement of said brackets with relation to said frame members, said ledges having the surfaces that are clampingly engaged by said screw heads and said brackets respectively disposed in parallel planes.

2. In a frame, a plurality of side frame members having mitered ends and of similar cross section affording an undercut groove opening through one side face of each member and having its open side defined by ledges cut away on their outer surfaces to afford clearance space, corner brackets extended into said undercut grooves from the mitered ends of said members, and binder-head securing screws extended through the open sides of said undercut grooves and threaded into said corner brackets to engage said ledges with the screw heads in said clearance spaces and with a clamping action that clamps said ledges between the screw heads and the opposed bracket to interlock said corner brackets against endwise displacement of said brackets with relation to said frame members, said ledges having the surfaces that are clampingly engaged by said screw heads and said brackets respectively disposed in parallel planes.

3. In a frame, a plurality of metal side frame members having mitered ends and of similar cross section affording an undercut groove opening through one side face of each member and having its open side defined by overhanging ledges, corner brackets extended into said undercut grooves from the mitered ends of said members, and headed securing screws extended through the open sides of said undercut grooves and threaded into said corner brackets to engage said ledges to interlock said corner brackets against endwise displacement of said brackets with relation to said frame members, said ledges

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having the surfaces that are clampingly engaged by said screw heads and said brackets respectively disposed in parallel planes.

4. In a frame, a plurality of side frame members having mitered ends and of similar cross section having side and edge faces and affording an undercut groove opening through one of said faces of each member, said undercut groove having its open side defined by ledges with rabbetted clearance grooves in their outer surfaces defining a clearance space over and bordering said open side of the undercut groove, corner brackets extended into said undercut grooves from the mitered ends of said members, and headed securing screws having the bottom surfaces of the heads disposed in planes perpendicular to the respective axes of such screws and such binder head screws being extended through the open sides of said undercut grooves and threaded into said corner brackets with the heads of said screws disposed wholly within said clearance spaces and engaging said ledges to interlock said corner brackets against endwise displacement of said brackets with relation to said frame members, said ledges having the surfaces that are clampingly engaged by said screw heads and said brackets respectively disposed in parallel planes.

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