Dec. 23, 1952 G. B. HAAS 2,622,710

INSULATED SASH FRAME

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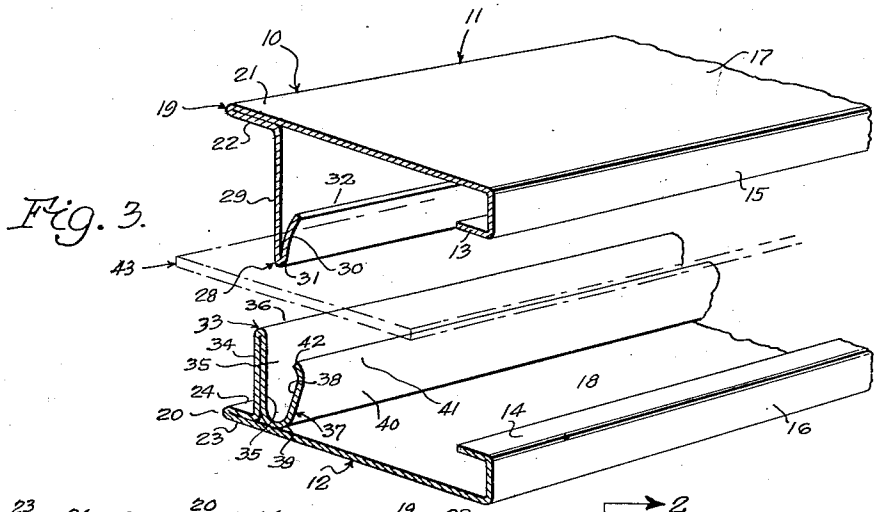


Fig. 3.

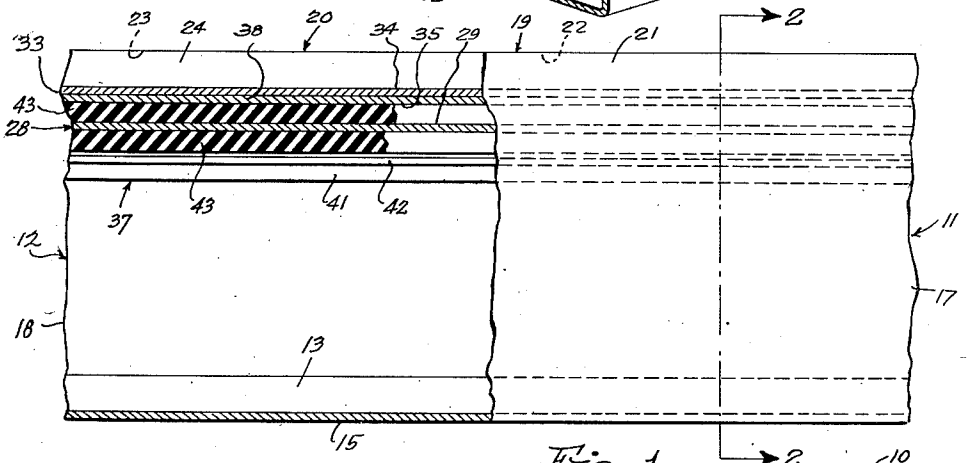


Fig. 1.

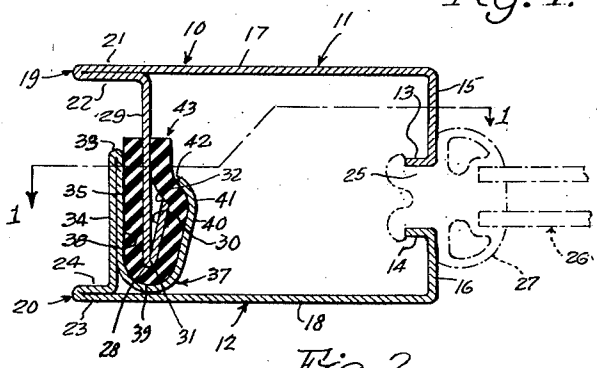


Fig. 2.

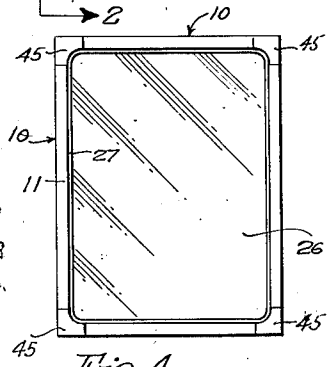


Fig. 4.

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INSULATED SASH FRAME

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3 Claims. (Cl. 189—76)

1

This invention relates to window sash frames and, in particular, to insulated window sash frames, especially of metallic construction.

One object of this invention is to provide an insulated window sash which is more simply and cheaply manufactured and assembled, the parts of the frame, exclusive of the panes and their mountings, consisting of two interfiitting frame structures and an insulating strip separating them.

Another object of this invention is to provide an insulated window sash in which the two structures composing the sash frame, lock themselves together after assembly without the need for separate fasteners.

Another object of this invention is to provide an insulated window sash in which there is no uninsulated contact between the interior and exterior faces of the sash frame, separate fasteners having been eliminated, so that heat conduction through the sash frame is minimized.

A still further object of this invention is to provide an insulated window sash of a construction such that vibration within the sash frame is absorbed.

In the drawings:

Figure 1 is a top plan view of a portion of the insulated sash frame according to a preferred form of the invention, partly in longitudinal section along the line 1—1 in Figure 2;

Figure 2 is a cross-section of the sash frame taken along the line 2—2 in Figure 1;

Figure 3 is an exploded perspective view of a portion of the sash frame before assembly, and

Figure 4 is a front elevation, in reduced size, of a completed window sash according to the present invention.

Referring to the drawings in detail, Figures 1 to 3 inclusive show a portion of the sash frame, generally designated 10, according to a preferred form of the invention, as including interengaging rolled metal half members 11 and 12. The members 11 and 12 have inner flanged portions 13 and 14, respectively, which are reversely-bent and parallel to segments 17 and 18, respectively, by nature of being bent at right angles to segments 15 and 16, which, in turn, are bent at right angles to segments 17 and 18 respectively.

Formed opposite the flanged portions 13 and 14 are reversely bent portions 19 and 20, consisting of segments 21 integral with the segment 17, and 22 and 23 integral with the segments 18 and 24. When the frame is assembled the flanged portions 13 and 14 form an open groove 25 into which the pane of glass 26 is inserted and held, preferably by means of a grooved rubber sealing strip 27 of channel-shaped cross-section. This invention is not concerned with the number and arrangement of the panes; hence the illustrated form of the insulated pane serves merely as an example, and 26 designates the pane unit as a whole, with the exception of the sealing strip 27.

2

Formed adjacent and at right angles to the reversely bent portion 19 in the part 11 is a reversely bent portion 28, consisting of segments 29 and 30 meeting at bent edge 31. The segment 30 is bent obliquely to the segment 29 and ends in a free edge 32.

In similar fashion, a reversely bent portion 33 is situated adjacent and at right angles to the reversely bent portion 20 of the part 12, and consists of segments 34 and 35 meeting at a bent edge 36. A continuation 37 of the segment 36 is again reversely bent, but more widely than before, enclosing a closed groove, trough or longitudinal socket 38. A curved portion 39 of the segment 37 extends upward into a straight portion 40, bending inwardly as at 41 and ending in a free edge 42. Space is provided between the inner edges of the trough 38 and the reversely bent portion 28, in assembly of the half-members 11 and 12, for an insulation layer 43 of rubber or other suitable insulating material which separates the said half-members 11 and 12 from each other. This insulation layer 43 may either be inserted in the form of a sheet, as shown in Figure 3, or it may consist of material inserted while in a fluid state in the intervening space between the half-members 11 and 12.

In the assembly of the invention, as shown in Figure 3, the strip of insulation material 43 is fed between the reversely bent portion 28 of the half-member 11 and the trough 38 of half-member 12, the window pane unit 26 being placed in position so that its lower edges, preferably encased in the sealing strip 27, rest upon the inner flanged portion 14. The two half-members 11 and 12 are then brought together, the bent edge 31 of the bent portion 28 bending the insulation strip 43 and forcing it down into the trough 38 as shown in Figure 2. In this position, the obliquely bent segment 30 of the reversely bent portion 28 forces the insulation strip 43 against the straight portion 40 of the segment 37, the free edge 32 of the segment 30 likewise forcing the said insulation strip upward against the inner surface of the curved portion 41 of the segment 37. As a result of this compression, facilitated by the yielding nature of the insulation strip, the curved portion 41 locks the assembly of the

window frame 10 together and prevents the free edge 32 from forcing the insulation upward out of the trough 38 and thus disengaging the two half-members. In the course of the assembly operation, the window pane unit 26 has been held in place by the inner flanged portion 13 of the half-member 11 (Figure 3).

An important feature of this invention can be seen in Figure 2: there is no direct mechanical contact whatever between the two half-members 11 and 12. The insulation strip 43 and the sealing strip 27 provide the only indirect contact between the members 11 and 12 and completely divide the interior and exterior portions of the window frame from one another.

The rubber sealing strip 27 is of any suitable type, the details of which form no part of the present invention. The sealing strip 27, for example, may be of the type disclosed and claimed in the Haas Patent No. 2,430,873, issued November 18, 1947.

The sash rails 10 consisting of the interengaging metal half members 11 and 12 may be united into a complete frame by means of the corner members 45 (Figure 4). The corner members 45 are of similar cross-section to the members 10, and are open at the ends of their arms to receive the ends of the members 10, which are preferably slightly reduced at their ends to provide a smooth transition and unbroken surface.

What I claim is:

1. An interlocking window sash frame insulating structure comprising supporting strips extending reversely back from the edges of the sides of the sash frame along the inner surfaces thereof, spaced inwardly-projecting flanges disposed in approximately parallel overlapping relationship and connected to said supporting strips at approximately right angles thereto, said strips and said flanges forming an outwardly-facing edge channel, one of said flanges including reversely-bent portions lying adjacent one another with an edge portion bent inwardly therefrom to form a groove directed transversely to the sash frame and adapted to receive the other flange, and an elongated strip of low heat-conductive insulating material bent into approximately U-shaped cross-section and engaging the opposite sides of one of said flanges and lying within the groove between said flanges, said structure lying wholly inwardly of said edge channel.

2. An interlocking window sash frame insulating structure comprising supporting strips extending reversely back from the edges of the sides of the sash frame along the inner surfaces thereof, spaced inwardly-projecting flanges disposed in approximately parallel overlapping relationship and connected to said supporting strips at approximately right angles thereto, one of said flanges including reversely-bent portions lying adjacent one another with an edge portion bent inwardly therefrom to form a groove directed transversely to the sash frame and adapted to receive the other flange, and an elongated strip of low heat-conductive insulating material bent into approximately U-shaped cross-section and engaging the opposite sides of one of said flanges and lying within the groove between said flanges, said structure lying wholly inwardly of said edge channel, said other flange having an edge portion bent reversely at an acute angle thereto and lying within said groove.

3. An interlocking window sash frame insulating structure comprising supporting strips extending reversely back from the edges of the sides of the sash frame along the inner surfaces thereof, spaced inwardly-projecting flanges disposed in approximately parallel overlapping relationship and connected to said supporting strips at approximately right angles thereto, one of said flanges including reversely-bent portions lying adjacent one another with an edge portion bent inwardly therefrom to form a groove directed transversely to the sash frame and adapted to receive the other flange, and an elongated strip of low heat-conductive insulating material bent into approximately U-shaped cross-section and engaging the opposite sides of one of said flanges and wholly inwardly of said edge channel, said other flange having an edge portion bent reversely at an acute angle thereto and lying within said groove, said grooved flange having an edge portion bent toward said reversely-bent edge portion of said other flange and gripping said insulating strip therebetween.

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