

July 18, 1967

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3,331,161

HINGED SASH CONSTRUCTION

Filed July 16, 1965

3 Sheets-Sheet 1

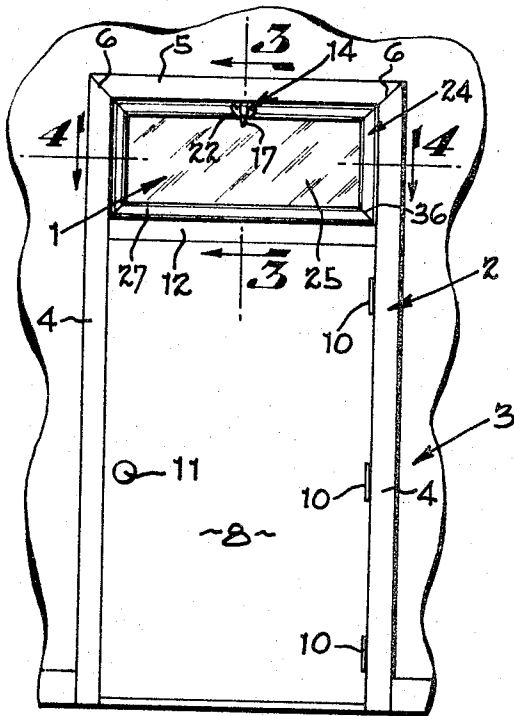


Fig. 1

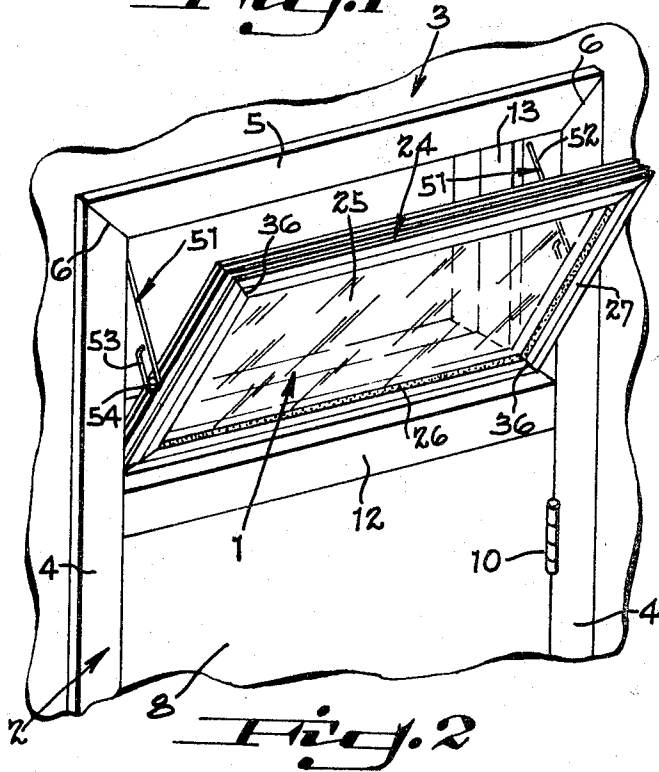


Fig. 2

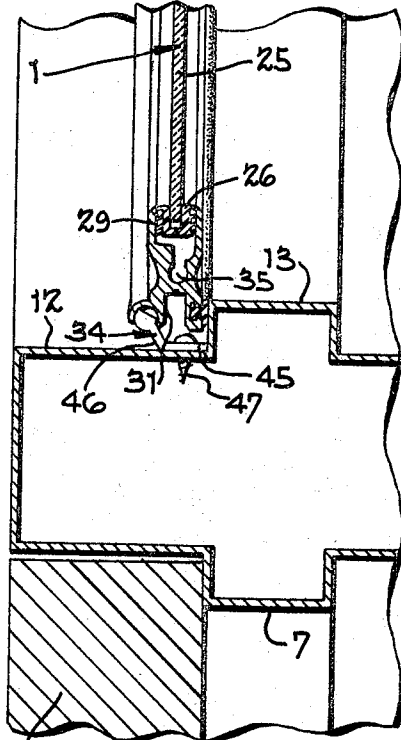
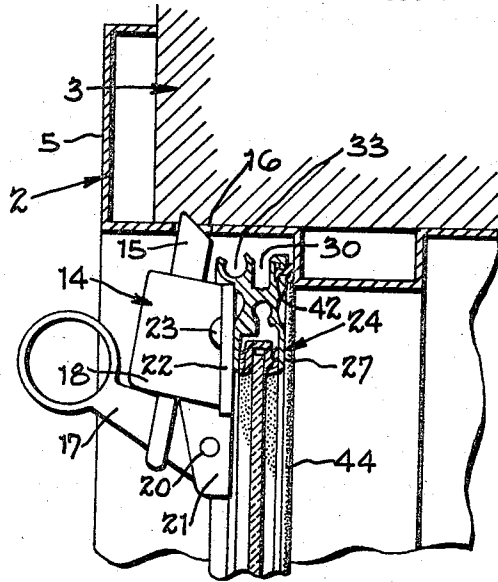


Fig. 3

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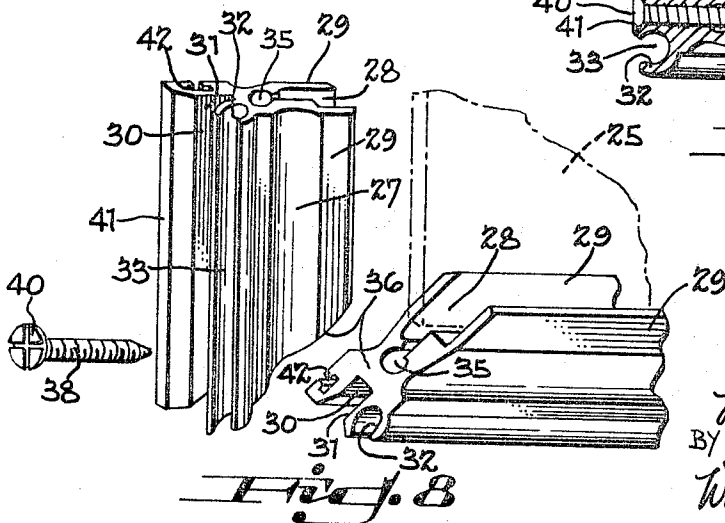
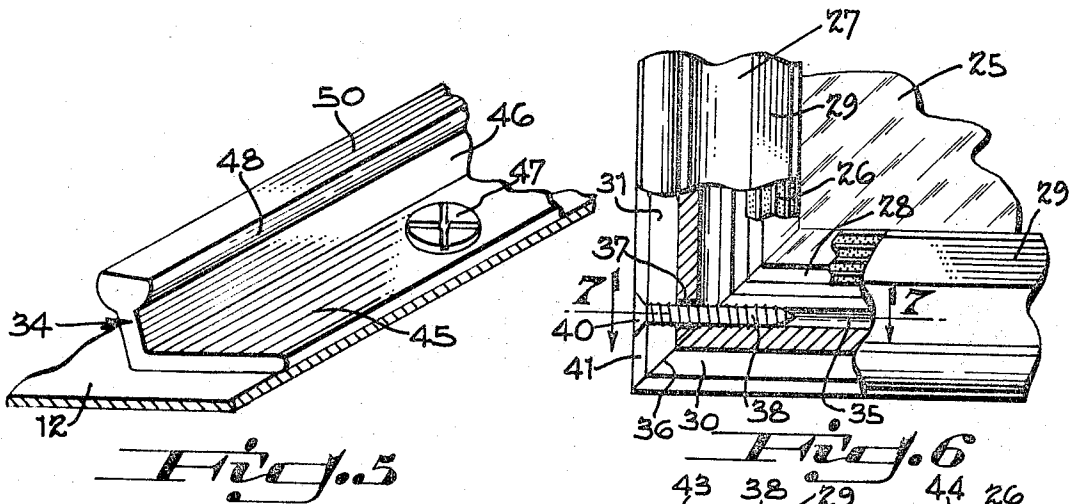
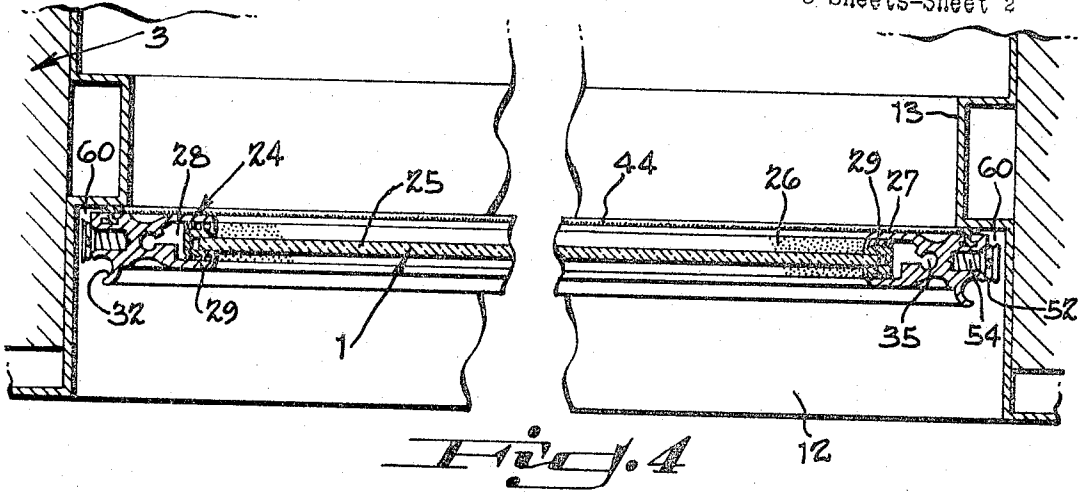
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3 Sheets-Sheet 2



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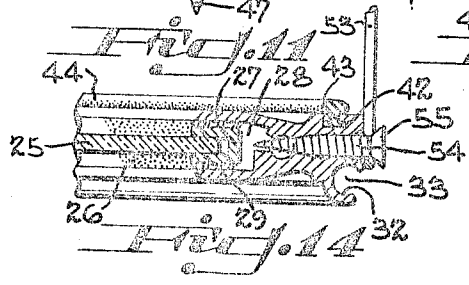
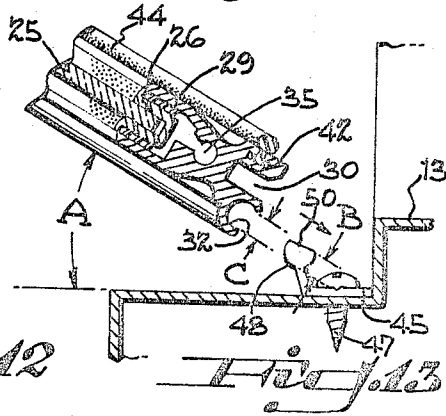
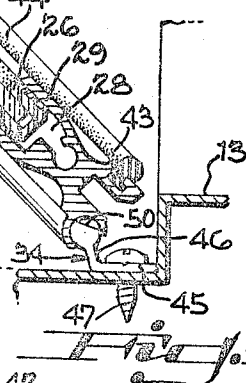
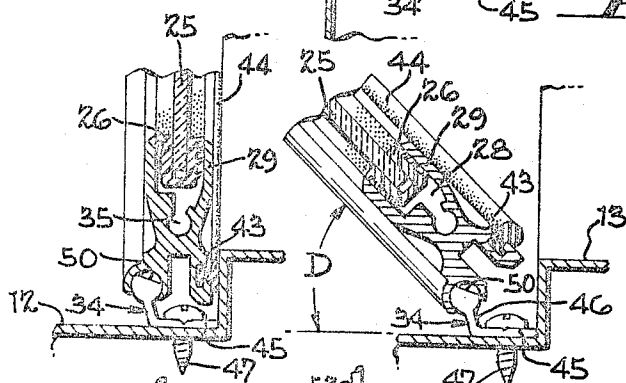
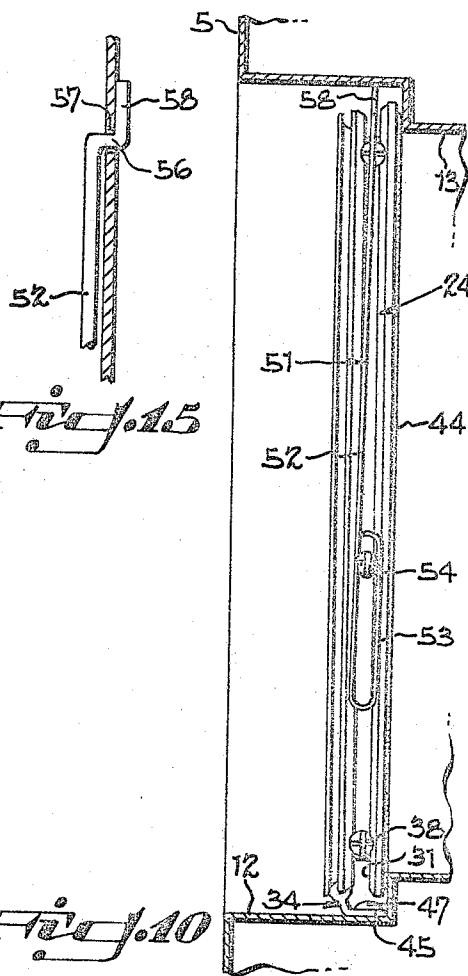
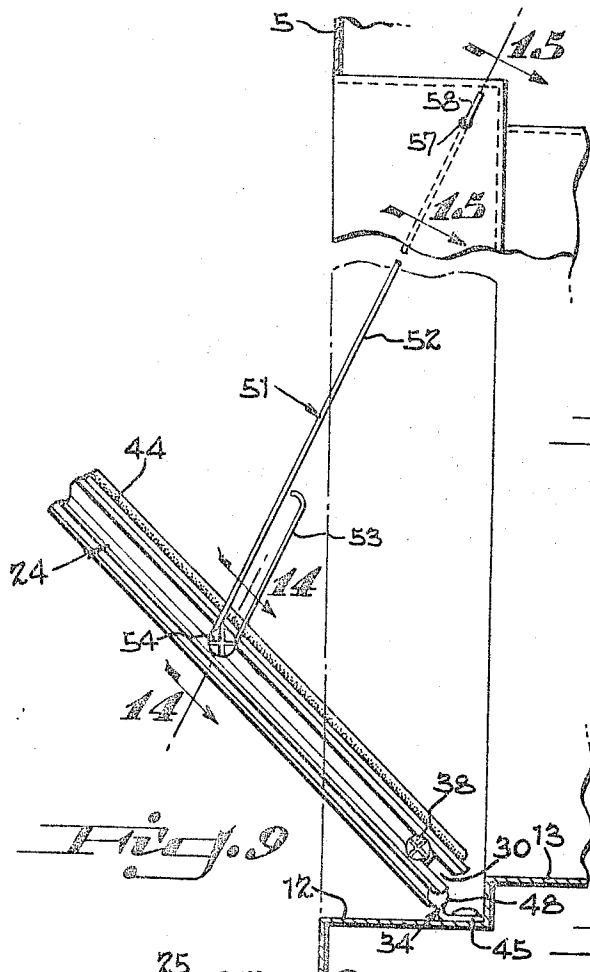
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HINGED SASH CONSTRUCTION

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3 Sheets-Sheet 3



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HINGED SASH CONSTRUCTION

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3 Claims. (Cl. 49—397)

This invention relates to window sashes and is directed more particularly to sashes having a continuous hinge arrangement which provides convenient mounting of the sash and which permits convenient demounting, if necessary.

The invention is disclosed in relation to a transom sash, that is, one which is mounted in a door frame above the door to provide light and ventilation. In the structure selected to illustrate the invention, the door frame includes a horizontal header and a pair of vertical jambs and further includes a horizontal cross member located below the horizontal header. The horizontal cross member of the door frame combines with the vertical door jambs to constitute the mounting frame for the door. The cross member also constitutes a mounting member for the transom sash which is hingedly connected according to the invention to the upper surface of the cross member above the door. It will be understood that the present transom sash construction is not limited to installation in door frames since substantially the same construction can be utilized for the construction of window frames generally wherein the sash is hingedly connected to the frame in which it is mounted.

One of the primary objectives of the invention has been to provide a transom sash having a sash frame formed of sectional framing rail members adapted to be fitted and assembled conveniently in the field, thereby to accommodate for different opening sizes or to accommodate for variations which may occur in a given opening size.

According to this aspect of the invention, the sash comprises a glass pane having dry flexible glazing strips, combined with framing members or rails fabricated preferably in the form of aluminum extrusions. Upon assembling the transom sash for a given opening, the framing members are cut to lengths to conform to the size of the opening, the corners being of mitered construction. After the framing members have been cut, the dry glazing strips may be cut to corresponding lengths, then the framing members are assembled about the glass pane with the glazing strips embracing the marginal edges of the glass pane and seated within the metal framing members. A fixed hinge strip is then cut to length and mounted upon the cross member of the door frame.

A further objective of the invention has been to provide a framing member or rail having a configuration in cross section which mates with the head portion of the fixed hinge strip to provide a continuous hinge adapting any one of the four framing rails to be used as a hinge member without any additional cutting or fitting. In this construction, the framing rail and fixed hinge strip are coupled together simply by inserting the framing rail at an angle upon the fixed hinge strip, then shifting the assembled frame upwardly to provide a locked mating engagement with the fixed hinge strip. Holding devices are then applied to the opposite side edges of the sash to limit the hinging motion to an angle above which the assembled sash can be uncoupled from the fixed hinge strip but at the same time permitting the sash to be pivoted upwardly to a closed position.

A further objective has been to provide an improved corner construction for the framing members of the sash permitting them to be permanently secured together with a minimum of machining operations in the field.

According to this aspect of the invention, the framing members are identical in cross section and each includes

an internal longitudinal screw recess. The cylindrical hinge recess, mentioned above, is located below the screw recess as part of the framing member. In assembling the framing members, with the glass pane in place, a clearance hole is drilled in alignment with the cylindrical screw recess at each corner, then a self-tapping screw is threaded into the cylindrical screw recess to join the mitered corners firmly into seating engagement with one another.

The features and advantages of the invention will be more clearly apparent to those skilled in the art from the following detailed description taken in conjunction with the drawings.

In the drawings:

FIGURE 1 is an elevation of a door which includes the transom sash of the present invention, with the sash shown in its closed position.

FIGURE 2 is a fragmentary perspective view illustrating the transom sash in its open position.

FIGURE 3 is an enlarged fragmentary sectional view taken along the line 3—3 of FIGURE 1, detailing the transom sash and the continuous hinge arrangement which supports the sash with reference to the door frame within which it is mounted.

FIGURE 4 is a sectional view taken along the line 4—4 of FIGURE 1, further detailing the transom sash in relation to the transom frame in which it is hingedly mounted.

FIGURE 5 is an enlarged fragmentary perspective view taken from FIGURE 3, illustrating the continuous stationary portion of the sash hinge which is attached to the cross member of the transom.

FIGURE 6 is a fragmentary view partially in section illustrating the corner construction of the transom sash.

FIGURE 7 is a fragmentary sectional view taken along line 7—7 of FIGURE 6, further detailing the sash construction.

FIGURE 8 is an exploded view with the frame rail members of the sash disassembled prior to the application of one of the corner attachment screws.

FIGURE 9 is a fragmentary sectional view of the transom frame generally as viewed in FIGURE 3 but showing the transom open and in elevation in order to illustrate the pivoted hold arm which limits the swinging motion of the transom to prevent it from being detached from its hinge.

FIGURE 10 is a view similar to FIGURE 9, showing the sash in its closed position.

FIGURES 11, 12 and 13 are enlarged fragmentary sectional views of the transom sash taken from FIGURE 3 and showing the swinging motion which is imparted to the transom sash in mounting it upon the continuous hinge strip.

FIGURE 14 is a fragmentary sectional view taken along line 14—14 of FIGURE 9, detailing the slide mounting of the hold arm with reference to its holding screw.

FIGURE 15 is a fragmentary sectional view taken along line 15—15 of FIGURE 9, detailing the pivotal mounting at the upper end of the hold arm.

General arrangement

Described generally with reference to FIGURES 1 and 2, a transom structure in accordance with the principles of the present invention is indicated generally at 1 and is mounted within the upper portion of a door frame indicated generally at 2. The door frame, in the example illustrated, is intended to be installed in the wall opening of a dry wall structure, which is indicated generally at 3 (FIGURE 3). The door frame 2 comprises a pair of vertical jambs 4—4 and a horizontal header 5, the corners of the jambs 4 and headers 5 being mitered as at 6 in the usual way.

The door frame members, comprising the vertical jambs 4 and horizontal header 5, are generally U-shaped in cross section (FIGURE 3), arranged to embrace the opposite sides of the dry wall structure 3. Each door frame member includes a door stop 7, of conventional design, adapted to engage the marginal edges of the door 8 in its closed position. In the present disclosure, the door 8 is mounted with reference to the door frame 2 by means of the hinges 10 (FIGURE 1) and includes the usual latch mechanism having a knob 11.

The upper portion of the door frame includes a cross member 12 (FIGURE 1) spaced below the header 5. Thus, the header 5, the cross member 12 in combination with the jambs delineate a frame in which the transom is hingedly mounted. The cross member 12 also acts as the header for the door frame and at the same time the mounting member for the transom. As best shown in FIGURE 3, the cross member 12 includes a stop 13 which registers with the stop 7 of the door frame and against which the transom 1 seats when in its closed position. The arrangement is such that when the door and transom are closed, the inner surface of the transom and the inner surface of the door both reside in the same vertical plane (FIGURE 3).

The upper edge portion of the transom sash includes a latch indicated generally at 14 (FIGURES 1 and 3) having a keeper 15 which engages a latching hole 16 formed in the horizontal surface of the header 5. The keeper 15 is spring-loaded and includes a release lever 17 for withdrawing the keeper 15 from the latching hole 16 counter to the biasing spring of the keeper. The keeper is slidably mounted in the housing 18 which includes the spring (not shown) and the release lever 17 is pivotally connected as at 20 to an extension 21 which projects downwardly from the housing 18. The housing 18 includes flanges 22 on opposite sides with screws 23 passing through the flanges into the frame of the transom sash. The latch 14 is a commercial device and since its detailed construction forms no part of the invention, a detailed disclosure has been omitted.

Transom sash construction

The transom sash 1 comprises, in general, a frame 24 (FIGURES 3 and 4) in which is mounted a glass pane 25. In the present disclosure the glass pane 25 is marginally confined within the frame 24 by means of dry glazing strips 26, formed of soft material such as plastic or rubber. The transom sash is intended for assembly in the field, permitting the sash to be fitted to various sash openings or to overcome variations in the size of the opening in which it is to be mounted.

Described in detail (FIGURES 3-8), the frame 24 is made up of framing rail members 27, preferably in the form of aluminum extrusions. Each of the four aluminum framing rails 27 comprises a one-piece unit having a glazing channel 28 delineated by a pair of arms 29-29 and a screw channel 30 delineated by arms 31-31. One of the arms 31 is provided by a cylindrical hinge recess 32. The hinge recess 32 includes an open side 33 adapted to interfit the stationary hinge strip indicated generally at 34 (FIGURE 5), which is attached to the cross member 12 of the door frame, as described later in detail. The framing rail 27 also includes a cylindrical screw recess 35 at the base of the glazing channel 28.

In assembling the frame 24, the adjoining ends of the framing rails at each corner are mitered as at 36-36 (FIGURES 6, 7 and 8), the four corners of the frame being of identical construction. As noted above, the miter cuts are made to provide a frame to interfit the transom sash opening which is delineated by the door frame. After the framing rails 27 are thus mitered at the four corners, the glazing strips 26, which are cut to lengths corresponding with the framing rails 27, are inserted into the respective glazing channels 28. The four rails are then inserted about the four sides of the glass pane 25, bring-

ing the mitered corners 36 into seating engagement. This brings the glazing strips 26 into engagement with the marginal edges of the glass pane 25.

Preferably after this operation, a clearance hole 37 is drilled at a point in alignment with the screw recess 36 of the adjacent strip 27 at each corner (FIGURE 6). A screw 38, preferably of the self-tapping type, is then inserted into the clearance hole 37 and is threaded into the screw recess 35 with a screwdriver (FIGURES 6, 7 and 8). The screw recess 35 thus acts as a tap hole adapting the screw 38 to cut its own threads as it penetrates the screw recess. By virtue of this arrangement, the screw channel 30 provides clearance for the shank of the screw beneath its flat head 40, thus decreasing the necessary depth of the clearance hole 37 which is drilled at the field. The surface of the flat head 40 is flush with the surface of the framing rail, the outer edge portions of the screw channel 30 being tapered outwardly as at 41 for this purpose.

In order to provide a weather seal, the arm 31 (FIGURE 7) is provided with a T-slot 42 shaped to receive a T-shaped portion 43 of a weather seal 44 which is formed of resilient material such as rubber. As shown in FIGURES 11 and 12, the weather seal strip 44 is compressed against the surface of the stop 13 of the door frame when the transom sash is swung to its closed position. After the transom sash is thus assembled it is ready to be installed upon the stationary hinge strip, previously indicated at 34.

Continuous hinge

The hinge strip comprises a base flange 45 (FIGURES 5 and 11-13) with a generally upright flange 46 rising from the edge of the base flange. The hinge strip is secured by self-tapping screws 47 passing through the base flange 45 and through the cross member 12 of the door frame. The upright flange includes a generally cylindrical head 48, the top portion of the head being removed to provide a flat 50. The hinge strip 34 extends substantially for the full length of the cross member 12 upon which it is mounted.

In order to install the assembled transom sash, the sash is held at an angle as indicated approximately at A in FIGURE 13 then the assembled sash is shifted in the direction indicated by the arrow to bring the hinge recess 32 into mating engagement with the partially cylindrical head 48 of hinge strip 34. The dimension B of the head 48 is slightly less than the open side 33 of the cylindrical hinge recess as indicated at C in FIGURE 13. This permits the cylindrical recess to be slipped in place loosely. Upon hinging the transom sash assembly upwardly approximately to the angle D shown in FIGURE 12, the open side 33 of the cylindrical hinge recess 32 establishes a locked mating engagement with respect to the head 48. At this point or above, a pair of pivoted hold arms 51-51 are connected to the sash, as shown in FIGURE 9. The hold arms lock the sash assembly at an angle at which the hinge elements are safely interconnected; the hold arms permit the sash to hinge upwardly to its closed position, as shown in FIGURE 10. If it becomes necessary to demount the sash, for example, to replace a broken glass pane, then the sash can be removed from its hinge strip 34 by disconnecting the hold arms 51 and by hinging the sash assembly back to the angle A of FIGURE 13.

As best shown in FIGURES 9 and 10, each hold arm comprises an elongated rod 52 having its upper end pivotally connected to the upper portion of the jamb at opposite sides of the transom sash assembly. The lower end portion of each rod is bent to form an elongated loop 53 which is slidably connected to the side of the sash assembly by a screw 54 (FIGURE 14) threaded into the framing member in the same manner as the screws 38 at the corners, as described earlier. The head 55 is larger in diameter than the width of the loop 53

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and the screw is not completely drawn tight in order to provide a sliding clearance with respect to the head 55. This permits the screw 54 to traverse the loop as the transom sash is shifted from its open position of FIGURE 9 to its closed position of FIGURE 10.

As shown in FIGURES 9 and 15 the upper end of each hold arm 51 is bent to form an off-set providing a pivot bearing 56 passing through an opening 57 formed in the side of the jamb at opposite sides. The off-set configuration provides a straight section 58 which resides to the opposite side of the jamb to lock the pivot portion against displacement. The location of the hold arms with reference to the jambs is best shown in FIGURE 4, the clearance 60 being provided between the opposite sides of the transom sash assembly and jamb surface.

It will be understood that the screws 54-54 are applied after the sash is hingedly mated with the hinge strip 34, with the sash hinged upwardly to or above the angle D shown in FIGURE 12. If it becomes necessary to remove the sash, then the screws 54 are simply removed to allow the sash to be hinged downwardly to angle A for uncoupling and removal.

I claim:

1. A transom sash assembly hingedly mounted in a transom opening of the door frame, said transom opening having a cross member hingedly mounting the transom sash, said transom sash assembly comprising:

a fixed hinge strip mounted upon said cross member; said fixed hinge strip having a mounting base secured to said cross member, a flange rising from the mounting base, and a cylindrical head formed upon the upper edge of said flange, said cylindrical head having a flat formed on the upper surface thereof;

said transom sash having a frame comprising respective extruded rail members which are identical in cross section;

a glass pane;

each rail member having a glazing channel facing inwardly with a marginal portion of the glass pane seated in said glazing channel;

each rail member having a screw recess formed at the base of the glazing channel;

each of said rail members having a cylindrical hinge recess formed in an outer edge portion thereof on the side opposite the glazing channel and facing outwardly;

the adjacent ends of said rail members being mitered and delineating the corners of the sash frame;

respective self-threading screws passing through the side at the end portion of one rail member and into threaded engagement endwisely with the screw recess of the adjacent rail member;

said self-threading screw drawing said mitered end portions into pressure engagement against one another and holding said adjacent rail members in alignment with one another;

said cylindrical hinge recess of one of said rail members interfitted upon said cylindrical head and estab-

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lishing a locked mating engagement therebetween providing a hinged joint, adapting the transom sash to be hinged from an outwardly inclined open position or to a vertical closed position with respect to said door frame;

and means connecting said transom sash to the door frame for holding said transom sash outwardly inclined at a position which establishes said locked mating engagement between the cylindrical hinged recess and the cylindrical head of the fixed hinge strip and adapting the sash to be hinged upwardly to said closed position.

2. A transom sash assembly as set forth in claim 1 in which said connecting means comprises:

a pair of hold arms in the form of rods each having an upper end portion bent to form an offset;

said door frame having openings formed therein above said cross member with said offsets of the hold arms passing through said openings and providing a pivot connection therewith;

the lower end portion of each hold arm being bent to form an elongated loop, said loops residing along opposite sides of said transom sash;

and means slidably connecting said loops to the opposite ends of said sash frame;

said hold arms arranged to hold the transom sash at said outwardly inclined position which establishes said locked mating engagement between said cylindrical hinge recess and the cylindrical head of said fixed hinge strip, adapting the said transom sash to be hinged upwardly from said outwardly inclined locking position to a vertical closed position relative to the door frame.

3. A transom sash assembly as set forth in claim 1 in which each framing rail member further includes an external screw channel formed in the extruded framing rail parallel with the cylindrical hinge recess and facing outwardly in a direction opposite to said inwardly facing glazing channel, said screw channel adapted to provide clearance for the outer end portion of the self-threading attachment screw which is applied to the sash assembly at the mitered joints forming the corners of the sash frame.

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