Aug. 28, 1951 O. O. McKINLEY ET AL 2,566,067

STORM WINDOW CONSTRUCTION

Filed April 19, 1946

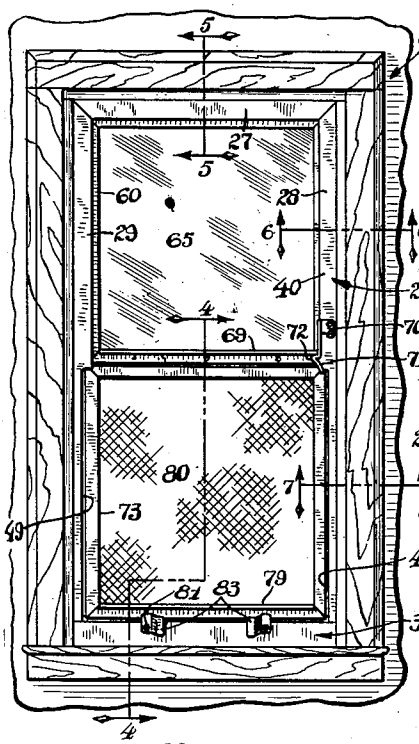


Fig. 1.

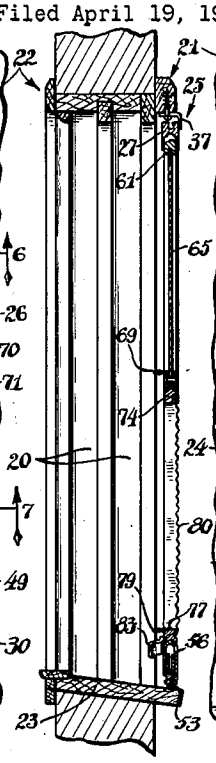


Fig. 3.

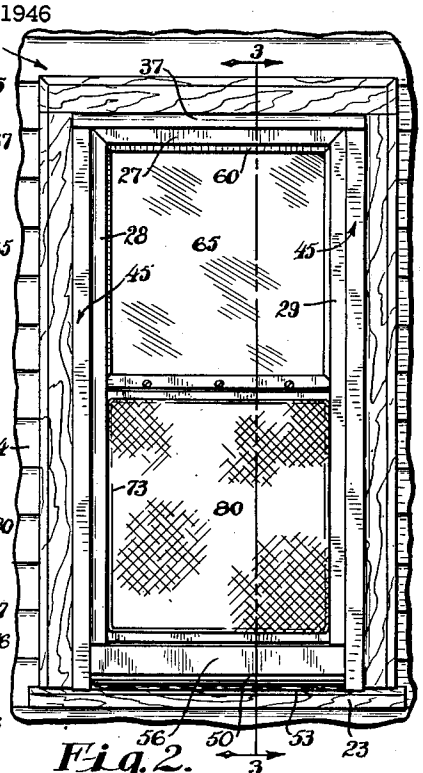


Fig. 2.

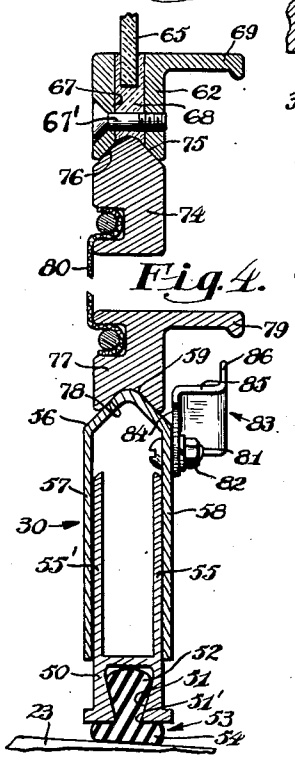


Fig. 4.

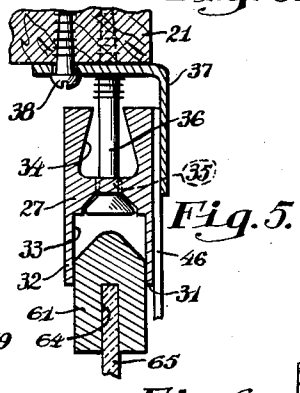


Fig. 5.

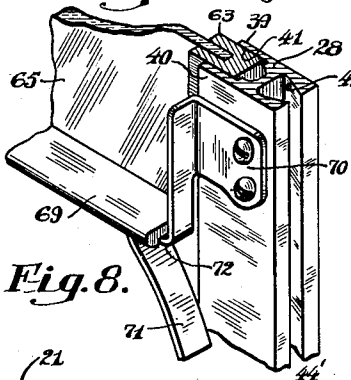


Fig. 8.

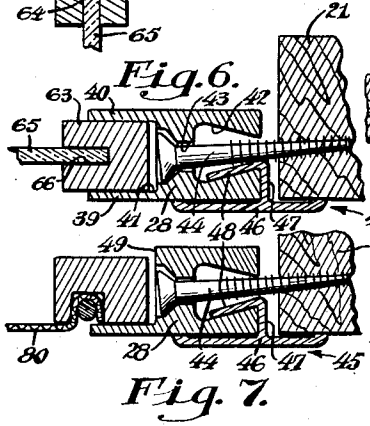


Fig. 6.

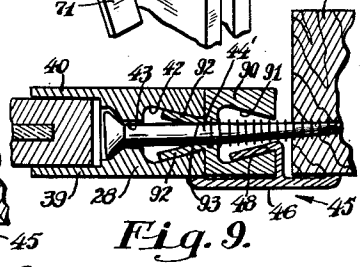


Fig. 9.

Fig. 7.

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STORM WINDOW CONSTRUCTION

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3 Claims. (Cl. 20—55)

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The present invention relates to auxiliary windows of the type usually referred to as storm windows, and particularly to that type of construction in which an auxiliary frame is semi-permanently installed in the standard window frame of a building, and is so constructed as to accommodate a pair of superposed, independently movable sashes. Either or both of such sashes may carry glass or screen, and the construction of the auxiliary frame is such as to permit removal of a glass-carrying sash and substitution of a screen-carrying sash therefor.

The primary object of the present invention is to provide a device of the character described so designed that it may feasibly be constructed substantially entirely of metal, whereby its life and efficiency will be substantially increased. Further objects of the invention are to improve details of such constructions, to the end that the entire assemblage may be more efficient and satisfactory than previously known devices of the same general character. Still further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, our invention may be embodied in the forms illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific constructions illustrated and described, so long as the scope of the appended claims is not violated.

Fig. 1 is an elevation of a window construction conforming to our invention, viewed from the inside of a building, with the standard window sashes removed;

Fig. 2 is a similar view taken from outside the building;

Fig. 3 is a vertical section taken substantially on the line 3—3 of Fig. 2 and looking in the direction of the arrows;

Fig. 4 is a similar section, taken substantially on the line 4—4 of Fig. 1 and looking in the direction of the arrows, the view being broken to reduce its dimensions;

Fig. 5 is a fragmental sectional view taken substantially on the line 5—5 of Fig. 1, and looking in the direction of the arrows;

Fig. 6 is a fragmental horizontal section taken substantially on the line 6—6 of Fig. 1 and looking in the direction of the arrows;

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Fig. 7 is a fragmental section taken substantially on the line 7—7 of Fig. 1 and looking in the direction of the arrows;

Fig. 8 is an enlarged fragmental perspective view of a latch, and associated parts, forming a part of the present invention; and

Fig. 9 is a view similar to Figs. 6 and 7, but showing an auxiliary adapter element associated with the previously illustrated parts.

Referring more particularly to the drawings, it will be seen that we have shown a standard window frame formed to provide guideways 20 for standard window sashes (not shown); the construction including an outside frame, indicated generally by the reference numeral 21 and an inside frame indicated generally by the reference numeral 22, each of said frames including a top member, two side members, and a common sill 23 inclining downwardly toward the outside wall 24 of the building. Our auxiliary frame construction is indicated generally by the reference numeral 25, and is preferably supported between the sill 23 and the top member of the outside frame 21, in the manner clearly illustrated in Fig. 3.

The reference numeral 26 indicates generally an auxiliary frame which comprises a top member 27, two parallel side members 28 and 29 and a bottom member 30, said members being suitably joined to produce a reasonably rigid supporting frame for the sashes later to be described. The top member 27 is formed, at its edge facing the interior of the frame, with parallel flanges 31 and 32 defining an inwardly opening groove guideway section 33 of substantial depth. In its outer edge, said member 27 is formed with a dovetail groove 34, extending substantially throughout the length of said member, and opening outwardly. A plurality of longitudinally spaced bores 35 penetrate the diaphragm between the guideway 33 and the groove 34 for the reception of screws 36 whereby said member 27 may be secured to the top member of the window frame 21. An adapter 37 is secured also to said frame member 21 by a plurality of screws 38, and is formed with a downturned flange which overlies the outer surface of the member 27 to seal any space which may exist between the member 27 and the frame member 21, against drafts and moisture.

The side members 28 and 29 are allochirally related, and therefore only one of said members is described in detail. The member 28 is formed, at its longitudinal edge facing toward the interior of the frame 26, with parallel flanges 39 and 40 defining a guideway or groove 41 which extends substantially throughout the length of said member. In its opposite edge, said member 28 is formed with an outwardly opening dovetail groove or channel 42 which likewise extends substantially throughout the length of said member; and a plurality of longitudinally spaced bores 43 open through the partition between the grooves 41 and 42 for the accommodation of screws 44 whereby said member 28 is secured to the side member of the standard frame 21. Associated with said side member 28 is a sealing strip, indicated generally by the reference numeral 45, and comprising a head 46 which overlaps the outwardly presented face of the member 28 and the substantially coplanar face of the standard frame 21, to seal any space existing between said members against drafts and moisture. The member 45 comprises also an integral stem 47 which is adapted to be positioned between the member 28 and the member 21; and a tail 48, acutely angularly related to the stem 47 upon such an angle that said tail may be received in the channel 42 in snug engagement with that wall of said dovetail channel adjacent the outwardly presented face of the member 28. The construction is such that the member 28 and the member 45 may be assembled by relative longitudinal sliding movement, but the engagement is reasonably snug so that, once assembled, there will be substantially no relative movement. It may be noted, from an examination of Figs. 6 and 7, that the screws 44 are preferably driven into the window frame 21 at a slight angle to the outwardly presented surface of said frame, whereby the action of said screws tends to tighten the engagement of the head 46 of the sealing strip 45 with the substantially coplanar surfaces of the standard frame and the auxiliary frame.

As will be seen from an inspection of Fig. 1, the flanges 40 of the side members 28 and 29 are cut away, as at 49, from a point just slightly below the middle of the frame 26, for a purpose which will later appear.

The bottom member 30 of the auxiliary frame is a composite construction, as is clearly illustrated in Fig. 4. It comprises a base element 50 formed, in its lower edge, with a dovetail groove 51 adapted to receive a portion 52 of a resiliently deformable strip 53 of water repellent material, such as rubber, the remaining portion 54 of which remains outside said groove and is adapted to bridge the mouth 51' of said groove and to be compressed between the member 50 and the sill 23. When material such as rubber is used for the element 53, the portion 52 thereof will be expanded into the dovetail groove 51 by the compression of the portion 54 thereof.

The upper edge of the member 50 is formed to provide a pair of parallel, spaced, upwardly projecting, longitudinally extending fingers 55, 55' which may preferably be resilient and normally slightly divergent. The other element 56 of the bottom member 30 is generally U-shaped to provide spaced fingers 57 and 58 adapted to engage snugly over the fingers 55 and 55' in telescoped relation; and the upper edge of said element 56 is suitably formed, as for instance into the shallow V 59, for cooperation with the bottom member of a sash to be supported in the auxiliary

frame. It will be clear that the composite member 30 is adjustable in height, the purpose being to provide for some slight adjustment to compensate for variations in standard window frame heights. The frictional engagement between the fingers 55 and 55' on the one hand and the fingers 57 and 58 on the other hand, will normally be sufficient to maintain the parts 50 and 56 in desired relationship; but in some instances it may be desirable to provide means for clamping or otherwise securing the members 50 and 56 in any selected relative position of adjustment.

A sash frame 60 (see Fig. 1) may be made up of a top member 61 (Fig. 5) a bottom member 62 (Fig. 4) and a pair of allochiral side members 63 (see Fig. 6), suitably connected together to form a reasonably rigid frame. The inwardly facing edge of the top member 61 is provided with a longitudinally extending groove 64 adapted snugly to receive the upper edge of a glass pane 65; and the side members 63 are formed with similar grooves 66. The bottom member 62 is formed with a longitudinally extending slot 67 communicating with the grooves 66 and coplanar with the groove 64. The glass pane 65 is assembled in the sash frame, after solid assembly of the frame, by insertion through the slot 67, and by sliding said pane through the lateral grooves 66 until its upper edge is firmly seated in the groove 64. Thereafter, an insert 68 (which may preferably be formed of hard rubber, though any other suitable insertable piece or packing material may be used), formed in its upper edge to receive and snugly support the lower-edge of the pane, is entered in the bottom of the slot 67 and secured in place by means of screws 67', or other suitable fastening means.

This construction may be used in any glazed sash, either upper or lower, though it is herein shown only in the upper sash. The bottom member 62 of the sash frame 60 is formed with an inwardly projecting finger ledge or flange 69 substantially perpendicular to the plane of said frame.

Mounted upon the inner surface of the member 28, slightly above the mid-point thereof, is a bracket 70 carrying a spring finger piece 71 formed with a latch nose 72 adapted to engage beneath the flange 69 of the upper sash 60 to support said upper sash in a position in which its top member 61 is sufficiently engaged in its groove 33 to seal against drafts and moisture. It will be noted, however, from an inspection of Fig. 5, that this normal supported position of the frame 60 is one in which the top member 61 is spaced slightly below the base of the groove 33. The reason for this construction will be understood as the description proceeds.

If desired, of course, the latch construction just described may be duplicated upon the frame member 29; but it is our present belief that such duplication will not be necessary.

A lower sash frame 73 may comprise a top member 74 whose outer edge is suitably formed for sealing engagement with the outer edge of the bottom member 62 of the upper sash frame 60. As illustrated, said upper edge of the member 74 is flatly V-shaped, as at 75, for engagement in a groove 76 formed in the lower edge of the bottom member 62 of the frame 60. Thereby, a draft proof and moisture proof seal is provided between the two sash frames. When the sash frame 73 is in position, it will support the sash frame 60.

The bottom member 77 of the sash 73 is similarly grooved, as at 78, to form, with the upper edge 59 of the member 56, a draft proof and moisture proof seal, said sash frame 73 normally being supported upon the member 56. Said bottom member 77 is formed with a lip or finger flange 79 which projects inwardly substantially perpendicular to the plane of said frame. As illustrated, a sheet of screening 80 is suitably supported upon the frame 73 in any well known manner.

At longitudinally spaced points, the member 56 carries, upon its inner surface, two swivel pins 81. Nuts 82 threadedly mounted on said pins are adapted to clamp in any desired position of adjustment a pair of brackets 83. Each of said brackets is substantially Z-shaped comprising a base portion 84 parallel with the plane of the sash frames and pivotally mounted near one corner, upon a pin 81, a web portion 85 projecting inwardly substantially perpendicular to said plane, and a guard portion 86, substantially parallel with the base portion 84. In the position in which said brackets 83 are illustrated, their base portions 84 project above the apex 59 of the member 56 sufficiently to prevent inward swinging movement of the bottom member 77 of the lower sash frame 73, even after said sash has been raised sufficiently to clear the member 56 from the groove 78. If, now, the members 83 are turned upwardly through an angle of 90°, their web portions 85 will lie substantially in a horizontal plane with said apex portion 59 of the member 56. Because of the clearance between the top member 61 of the upper sash 60 and the base of the groove 33, the two sashes may now be raised slightly, by lifting upon the lip 79, to clear the member 56 from the groove 78. Because of the cut away portions 49 of the flanges 40 of the side members 28 and 29, an inward pull upon the lip 79 will cause the sash to swing about its upper edge as a hinge, said upper edge being held against inward movement by the projecting portions of the flanges 40; and the bottom member 77 of the lower sash frame 73 may be brought to rest upon the web portions 85 of the brackets 83, being limited in its inward movement by the portions 86 of said brackets. This position of the parts is desirable, of course, only in the winter when the lower sash frame, as well as the upper sash frame, will carry a glass pane.

On the other hand, if the brackets 83 are turned downwardly 90° from their illustrated positions, the whole of said brackets will be disposed below the horizontal plane including the apex of the member 56. With the brackets in that position, when the lip 79 is lifted and pulled inwardly, the sash 73 can be swung far enough inwardly to permit its bodily extraction from the frame 26. As the sash 73 is withdrawn from the frame, the sash 60 will come to rest upon the nose 72 of the latch 71. Now a substitute sash frame like the frame 73 may be introduced into the organization, if desired.

On the other hand, if it is desired to do so, after removal of the sash 73, the nose 72 of the latch 71 may be withdrawn from engagement beneath the lip 69, whereupon the sash 60 may be lowered into the position previously occupied by the sash 73, and may be withdrawn from the assembly in the manner above described. The function of the latch 71 of course, is to support the sash 60 at times when the sash 73 is not in position to support said sash 60.

In Fig. 9, we have shown the frame member

28 associated with an adapter 90. Occasionally, an outsize window frame may be encountered; and when that occurs, the provision of the dovetail slots in the elements of the frame 26 makes it possible to associate therewith one or more adapters like the element 90. The adapter 90 comprises a metallic bar formed, in one edge, with a dovetail groove 91 identical with the dovetail groove 42. At its opposite edge, the bar 90 is formed with a pair of diverging fingers or flanges 92, the angle of flare of said fingers being identical with the angle of flare of the groove or channel 42. Therefore, the adapter 90 may be assembled with the frame side member 28 (or with any one of the other members of said frame) by entering the fingers 92 in one end of the channel 42, and then moving the members 28 and 90 relatively longitudinally. The illustrated construction very firmly secures the two bars together; and the adapter 90 is formed with a plurality of ports 93 adapted to register with the ports 43 of the side member 28 for the accommodation of screws 44', longer than the screws 44.

We claim as our invention:

1. In a storm window for mounting in a standard window frame, an auxiliary frame including a top member, a bottom member, and two side members, each of said side members being formed, in its perimetral edge, with a longitudinally-extending groove, and a sealing strip for each of said side members, each sealing strip being fixedly assembled with its associated side member and comprising a head overlapping the outer face of such side member and projecting perimetrally therebeyond to overlap the sustantially coplanar portion of the adjacent side of the window frame, a stem substantially perpendicular to said head and extending to lie between its associated frame side member and the adjacent side of the window frame, and a tail angularly projecting from said stem and received in the groove of its associated frame side member.

2. In a storm window for mounting in a standard window frame, an auxiliary frame including a top member, a bottom member, and two side members, each of said side members being formed, in its perimetral edge, with a longitudinally-extending dove-tail groove, and a sealing strip for each of said side members, each sealing strip comprising a head overlapping the outer face of its associated side member and projecting perimetrally therebeyond to overlap the substantially coplanar portion of the adjacent side of the window frame, a stem substantially perpendicular to said head and extending to lie between its associated frame side member and the adjacent side of the window frame, and a tail projecting from said stem at an acute angle thereto, received in the groove of its associated frame side member, and snugly engaging and conforming to one of the diverging walls of said groove.

3. In a storm window for mounting a standard window frame, an auxiliary frame including a top member, a bottom member, and two side members, each of said side members being formed, in its perimetral edge, with a longitudinally-extending dove-tail groove, and a sealing strip for each of said side members, each sealing strip comprising a head overlapping the outer face of its associated side member and projecting perimetrally therebeyond to overlap the substantially coplanar portion of the adjacent side of the window frame, a stem substantially perpendicular to said head and extending to lie be-

tween its associated frame side member and the adjacent side of the window frame, and a tail projecting from said stem at an acute angle thereto, received in the groove of its associated frame side member, and snugly engaging and conforming to that wall of said groove nearest the face of said frame member overlapped by said strip head.

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