Aug. 22, 1967 J. G. MacGREGOR 3,336,698

WINDOW ASSEMBLIES

Filed Jan. 18, 1965 3 Sheets-Sheet 1

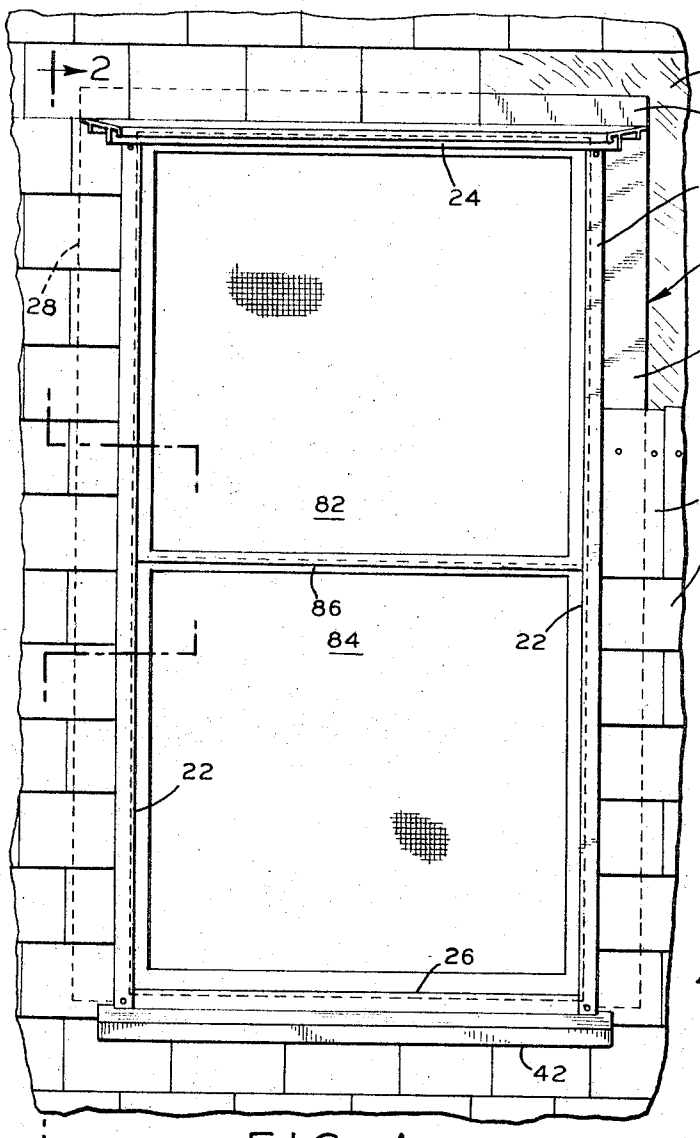

FIG. 1

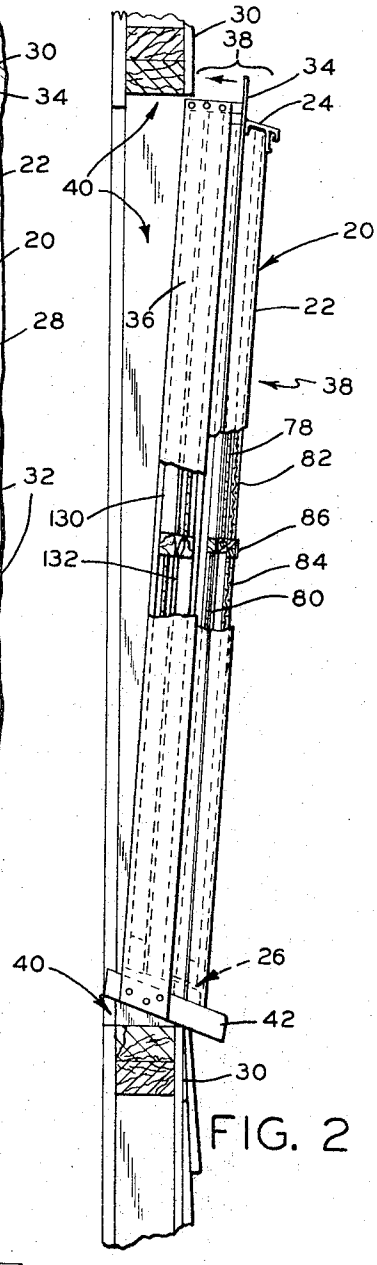

FIG. 2

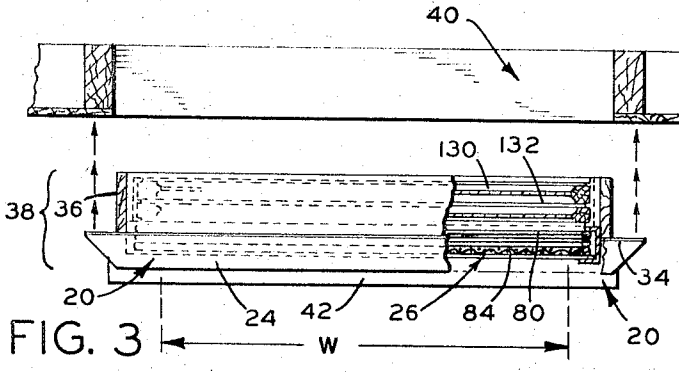

FIG. 3

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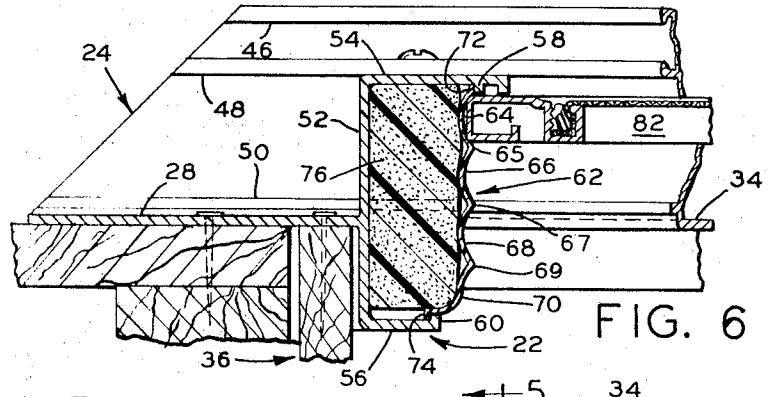

FIG. 6

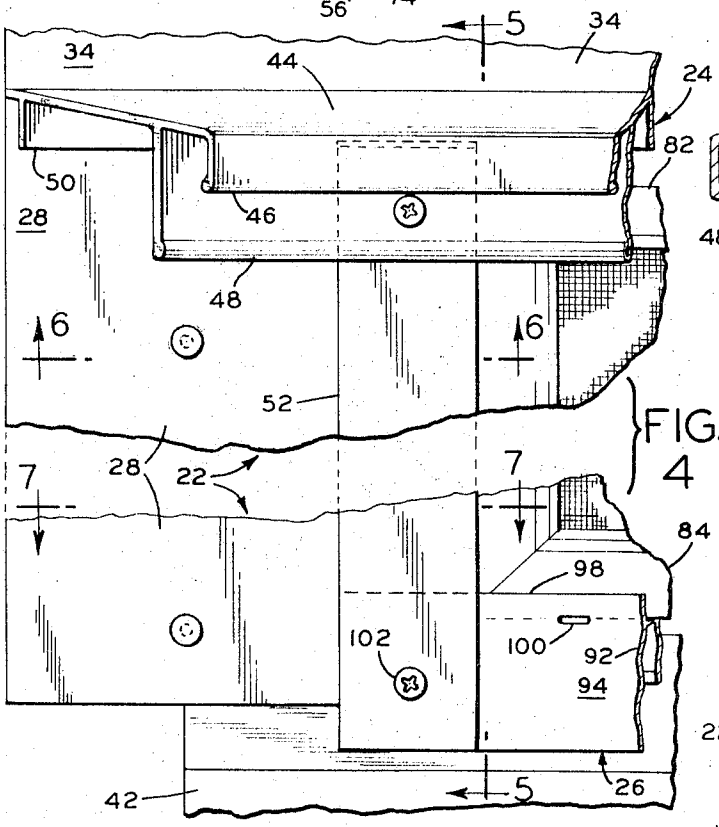

FIG. 4

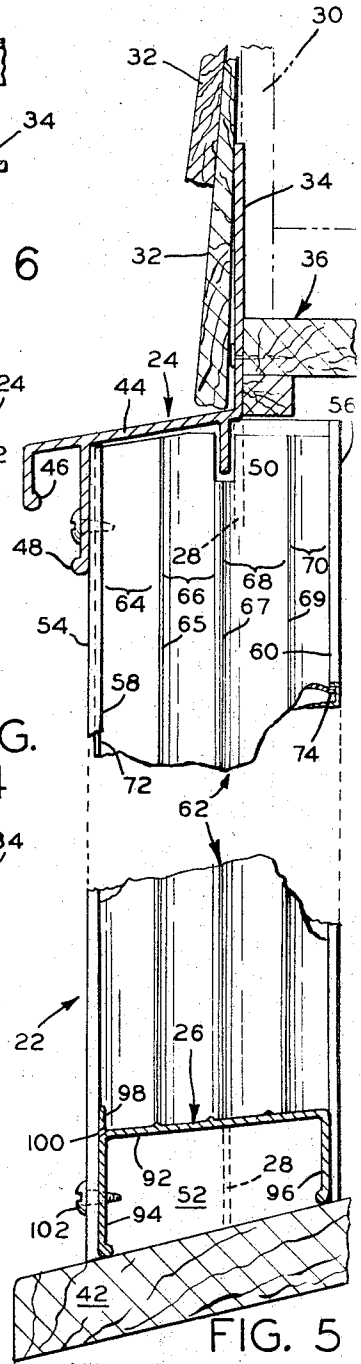

FIG. 5

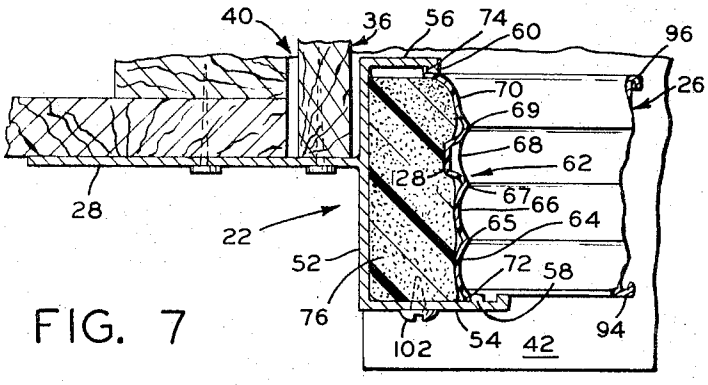

FIG. 7

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FIG. 9

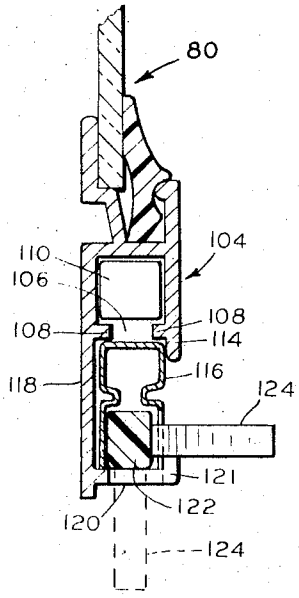


FIG. 8

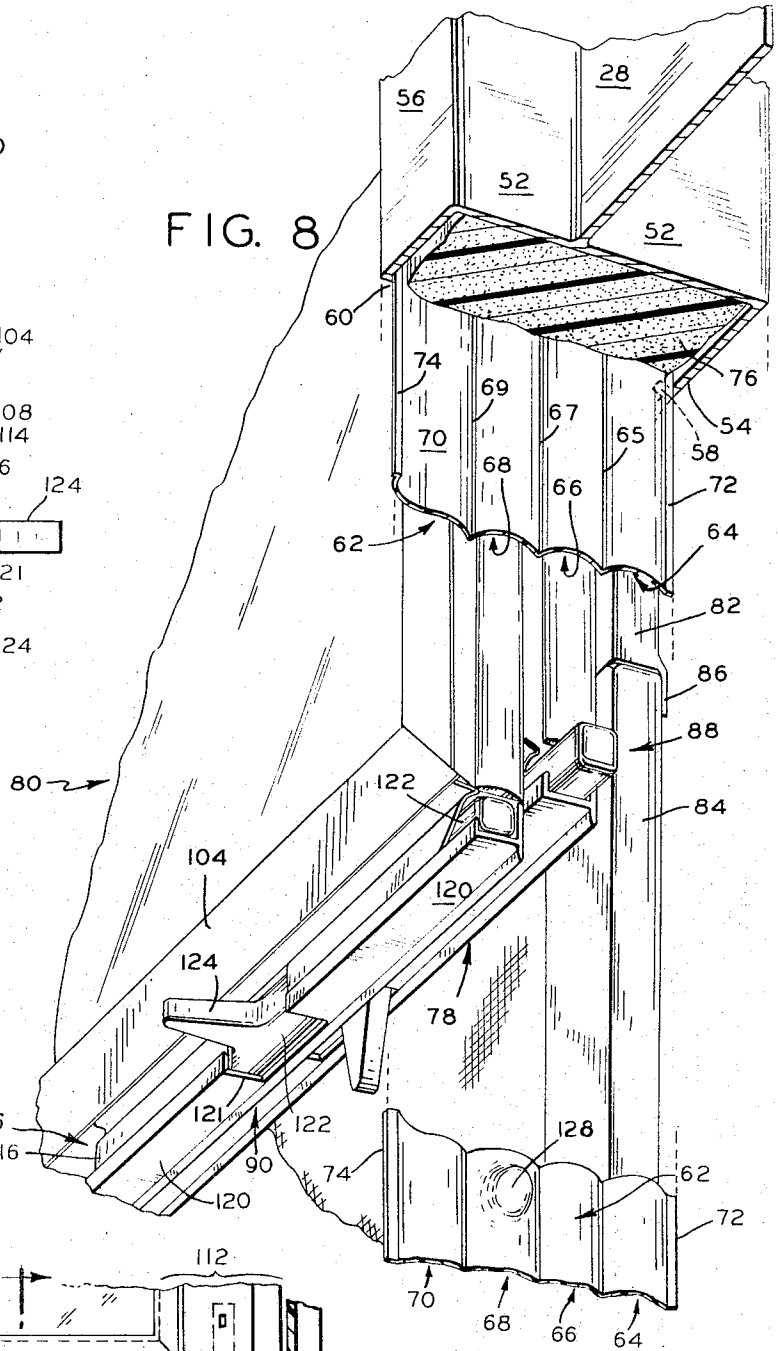
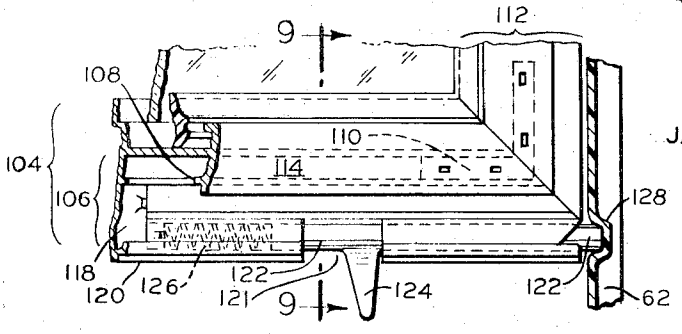


FIG. 10



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United States Patent Office 3,336,698 Patented Aug. 22, 1967

3,336,698

WINDOW ASSEMBLIES

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Filed Jan. 18, 1965, Ser. No. 426,292
10 Claims. (Cl. 49—380)

This invention relates to window assemblies, and particularly to the storm window, screen and frame assemblies known as "combination" window units.

Permanently installed "combination" storm windows and screens have become popular because they are long-wearing and light in weight, and because they eliminate the need for removal and substitution of screens and storm windows semi-annually. Fabrication of storm sash and screen frames from extruded aluminum has greatly extended the useful life and weatherproof character of these assemblies.

Such combination window assemblies introduce serious problems in the erection and maintenance of buildings, however, for their frames are generally designed for insertion directly in the sash openings formed by the head, jambs and sill of the window frame, somewhat as an "accessory," or extra improvement, greatly reducing the original view opening of the window. Such window frames therefore require normal exterior finishing trim and drip cap, and they require complete painting. Such combination window units, sized to fit a variety of window frames, are generally custom built and often introduce cracks, air leaks and rattling, thus requiring caulking after installation. Such conventional window installations must have drip caps and flashing carefully installed to avoid water damage, and the labor of installation and painting is not simplified by the addition of such storm and screen combination windows.

The present invention vastly simplifies the builder's installation of window units. The combination storm-window and screen units of the present invention are employed to finish the exterior frame of a conventional double hung sash window, forming the exposed outer trim and drip cap of the window assembly, and they provide automatic flashing around the top and both sides of the entire window unit. Aside from the protruding still, exterior finish painting of the window is entirely eliminated.

Unusually wide view openings are provided by the windows of this invention, together with an extended useful life and quiet, trouble-free operation. These units require no caulking and are automatically weatherstripped by resilient tracks. The use of extruded aluminum, stainless steel, and plastic materials to form the parts of the present invention provides high weather-resistance and long useful life.

The present invention provides all the advantages of modular prefabricated construction with precut standard sizes assembled either during production or in the storage warehouse or at the site to fit all standard sizes of rough window openings, with minor size variations being compensated by adjustable sliding corner fit in the assembled window units.

Accordingly, a principal object of the invention is to provide modular, prefabricated window assemblies which can be easily assembled and erected as complete window units in all standard sizes of rough window openings or window frames.

Another object of the invention is to provide such window assemblies which are well adapted for installation with window frame units to form a complete window assembly, closing, capping and flashing the rough window opening in a building under construction.

A further object of the invention is to provide window assemblies incorporating self-caulking and self-weatherstripping features, eliminating air leakage while providing smooth, trouble-free operation, with easy raising and lowering of window sashes which can be latched in different open positions.

Another object of the invention is to provide window assemblies affording unusually wide view openings to admit a maximum amount of light.

Other and more specific objects will be apparent from the features, elements, combinations and operating procedures disclosed in the following detailed description and shown in the drawings, in which:

FIGURE 1 is a fragmentary front elevation view of a completely erected and installed window assembly incorporating the present invention;

FIGURE 2 is a sectional side elevation view of the window assembly of FIGURE 1 shown during its installation;

FIGURE 3 is a sectional top plan view of the window assembly of FIGURE 2 during its installation;

FIGURES 4, 5, 6 and 7 are enlarged fragmentary sectional views showing the construction details of the erected window assembly of FIGURE 1. FIGURE 4 is a fragmentary front elevation view; FIGURE 5 is a fragmentary side elevation view; FIGURE 6 is a fragmentary bottom plan view and FIGURE 7 is a fragmentary sectional top plan view; FIGURES 5, 6 and 7 are taken along the indicated section lines in FIGURE 4.

FIGURE 8 is a fragmentary rear corner perspective view of the screen and sash window units showing their supporting guide and latching mechanisms;

FIGURE 9 is a sectional end elevation view of the lower window sash rail of one of the sashes shown in FIGURE 8; and

FIGURE 10 is a fragmentary rear elevation view, partially in section, of the assembly shown in FIGURES 8 and 9, illustrating the operation of the latch mechanisms of the present invention.

The assembled window units of the present invention are well adapted to form integral prefabricated and preassembled windows for installation directly into rough window openings. In warmer climates these window units will be the only window incorporated in each window opening, and they may include double-hung sliding upper and lower sashes and one lower screen or both upper and lower screens if desired.

In colder climates, the window assemblies of this invention provide combination storm and screen window units ready for mounting to form the front face of the ordinary assembled double-hung window unit, replacing the exterior exposed members of this window unit to provide self-flashing and an integral drip cap which minimize the installation and painting of trim surrounding the finished window. The outer sheathing of the building, such as shingles or clapboards, extends over and completely covers the self-flashing of these window units, as shown in FIGURE 1.

In the window assembly **20** shown in FIGURES 1 and 2, a pair of jambs **22** are joined by a head **24** and foot **26** to form the rectangular frame for the assembled window unit **20**. Each of the jambs **22** is provided on its outer side with a broad flashing flange **28** extending beyond the opening for the window over a substantial margin of the rough sheathing **30**, and flange **28** is covered in turn by the finish sheathing, such as shingles **32**, all as shown in FIGURE 1.

The head **24** is provided with a similar flashing flange **34** extending upward beyond the rough window opening, covering the rough sheathing **30** and also being covered by the external finish sheathing **32**. As shown in FIGURE 3, the window assembly **20** combines with the double-hung frame and sashes **36** to form the assembled window unit **38**, with the assembly **20** providing the external flashing,

drip cap and exterior trim for this unit **38**. The window assembly **20** is designed to be erected, assembled and installed in window frame **36** by the lumber yard or building supply distributor, and completed window units **38** are thus made available in standard sizes for shipment to building sites for prompt installation by the builder. The installation of the assembled window unit **38** is illustrated in FIGURE 2 where the combination of frame **36** and assembly **20** comprising the assembled window unit **38** is shown being tilted into position in the rough window opening **40** in a building under construction.

As shown in FIGURE 2, during installation of the window unit **38** in the rough opening **40**, the outer edge of the sill **42** forming the lower portion of the frame **36** is rested in the rough opening **40**. The upper portion of the unit **38** is then pivoted toward and into the rough opening **40**, pivoting about the outer lower edge of the rough opening **40** until flashing flanges **28** and **34** rest against the primary rough sheathing **30** of the building. The assembled unit **38** is then secured in the window opening, with the flashing flanges **28** and **34** being nailed through the primary sheathing **30** to the frame members forming the rough opening **40**, for example.

Head flashing and drip cap member

The head member **24** with its flashing flange **34** is shown in more detail in FIGURES 4, 5 and 6. Member **24** may be formed of extruded aluminum for example with a cross section like that shown in FIGURE 5. It preferably incorporates two principal flanges joined to form an angle configuration. These are the upstanding flashing flange **34** and the outwardly protruding and downwardly slanting cap flange **44** forming a drip cap over the window and terminating in a downwardly protruding rim **46**. Extending downwardly from the underside of the cap flange **44** are two flanges forming structural parts of the head member **24** and also serving to stiffen it. These are a front flange **48** and a rear flange **50**. As shown in FIGURES 4, 5 and 6, the jamb member **22** is secured to the rear side of front flange **48** directly under the cap flange **44**, and the front flange **48** thus forms the upper boundary rim of the finished window opening. The rear flange **50** extends downward behind the upper storm sash to provide weatherstripping and sealing of the finished assembly.

Jamb members

Each of the jamb members **22** incorporates a U-shaped channel facing the window opening, formed by a jamb web **52** in the shape of a thin, flat plate generally perpendicular to the sheathing of the building, and having a wide outer flange **54** extending into the window opening, and a narrower inner flange **56** also extending into the window opening. The outer and inner flanges are substantially parallel, and thus form between themselves a channel for mounting the window sashes and screens. Extending away from the window on the opposite side of the jamb web **52** is the jamb flashing flange **28**. Jamb flashing flange **28** is substantially parallel to the outer and inner flanges **54** and **56** and is displaced with respect to outer flange **54** to bring head flashing flange **34** and jamb flashing flange **28** substantially into the same plane, both lying flat against the primary sheathing **30** of the building. The jamb member **22** is secured to the rear side of front flange **48** on head member **24** when the assembled window unit is formed, ready to be installed in the rough window opening.

The outer and inner flanges **54** and **56** are each provided with inturned retainer rims **58** and **60** respectively. A scalloped track guide member **62** shown in FIGURES 5, 6 and 7 spans the U-shaped channel formed by outer and inner flanges **54** and **56** and by jamb web **52**. The track guide **62** is formed of rolled or extruded metal or hard extruded plastic, for example, and it is shaped with the desired number of track grooves such as the concavely arcuate shallow grooves **64**, **66** and **68**. In the embodiment shown in FIGURES 6 and 8, these three similar concave tracks **64**, **66** and **68** in the track guide **62** are arrayed side by side in a plane generally parallel to the jamb web **52**, and are separated from each other only by their junction ridges **65** and **67**. Beyond track groove **68** is a gentle reversely curved or "S-curved" portion **70** of the track guide **62**, separated from groove **68** by another junction ridge **69**, and terminating in an outwardly retaining flange **74**. The opposite edge of track guide **62** is provided with a similar outwardly projecting retaining flange **72**, and the overall configuration of the grooved track guide **62** is shown in FIGURES 5, 6, 7 and 8.

The retaining flanges **72** and **74** are positioned behind the respective retainer rims **58** and **60** on jamb **22** in the assembled window unit. Interposed between the jamb **22** and track guide **62** is a compressed rectangular slab **76** of resilient, compressible foam material such as polyurethane or foam rubber. The foam slab **76** is an elongated block of resilient foam extending over substantially the entire vertical height of jamb **22** behind track guide **62**, urging track guide **62** away from jamb web **52** and toward the center of the window opening.

As shown in FIGURES 6 and 7, the foam block **76** is provided with a cross section extending across the substantial width of the jamb **22** from inner flange **56** to outer flange **54**. The normal thickness of the foam block **76** in its free and uncompressed state is slightly greater than the maximum distance from the unexposed face of track guide **62** to the facing surface of jamb web **52** when track guide **62** is positioned with its retaining flanges **72** and **74** inside the retainer rims **58** and **60** of the jamb **22**.

The assembly of these members **22**, **62** and **76**, with track guide **62** being urged by block **76** away from jamb web **52** in jamb **22** and toward the retainer rims **58** and **60** which hold it in position, maintains the foam block **76** in slight resilient compression. The block **76** is very much more compressible than this, however, and its further resilient compression is produced by any outside force acting in any one of the track grooves **64**, **66** and **68** for example. Thus the normal action of urging a window sash unit or a window screen unit edgewise into any one of the track grooves further compresses the block **76**. In the normal installed position of these sash and screen units, held between the facing track grooves on opposite jambs, the foam blocks **76** installed in each jamb **22** are maintained compressed, urging the track guide **62** toward all of the sash or screen units.

The "scalloped" shape of the thin, grooved track guide **62**, and its S-curved section **70**, co-operate to give it excellent stiffness and rigidity against columnar buckling under vertical loads acting generally parallel to its grooves, while permitting resilient bending and flexure under normal loads acting toward the exposed surface of guide **62**.

As a result, as indicated in FIGURE 8, each of the grooves **64**, **66** and **68** flexes toward the lateral edges of the screen **82** or sash **78** or **80** gripped between the two facing track guides **62**. The compressible, "squashy" deformation of foam block **76** tends to equalize the gripping force applied by grooves **64**, **66** and **68**, and flexible track guide **62** flexes to equalize these gripping forces lengthwise along the grooves and between adjacent grooves as well. The columnar stiffness of scalloped track guides **62** under vertical loads provides solid support for the sashes **78** and **80** in their vertically raised positions, without reducing this flexing equalizing of gripping forces.

The compressibility of foam blocks **76** facilitates easy removal of sash or screen units from the window assembly. Referring to FIGURES 2 and 8, the normal units installed in the window assemblies of this invention include an upper storm sash **78** positioned in central track groove **66**, a lower storm sash **80** positioned in the innermost track groove **68**, and two screen units, an upper screen **82** and a lower screen **84** both positioned in the outermost track groove **64**.

The upper screen **82** is provided with a depending outer flange **86** along its lower edge overlapping the lower screen

84, as shown in detail in FIGURE 8 and also in FIGURES 1 and 2. The outer flange 86 serves to position the screens 82 and 84 in track groove 64 and to provide a neat-appearing air seal between the screens to block the entry of insects between them. Since screens 82 and 84 stand one above the other in track groove 64, they require no latch mechanisms to maintain them in their vertical positions. The upper storm sash 78 is provided with a pair of latches 88 in its lower corners and the lower storm sash 80 is provided with a similar pair of latches 90 in its lower corners. These latches 88 and 90 are shown in the enlarged perspective view of FIGURE 8, and in FIGURES 9 and 10.

Convenient removability

The resilience of the flexible and compressible foam block 76 and the corresponding flexibility of the thin track guide 62 provides unusually convenient removability for the storm sashes 78 and 80 and the two screens 82 and 84. The mere action of drawing the lower storm sash 80 toward the interior of the building, urging it from its track groove 68 toward the inner flange 56 of jamb 22 causes this lower storm sash 80 to ride over the junction ridge 69 between grooves 68 and S-curved portions 70 of the track guides 62, and both track guides 62 are correspondingly urged outwardly toward jamb 22, compressing foam block 76 and allowing lower storm sash 80 to be withdrawn easily by the user inside the building. The upper storm sash 78 and the two screens 84 and 86 may also be removed by merely drawing them past the ridges 65 and 67 in track guide 62 flexing guides 62 and compresing the foam blocks 76 in each jamb 22 as the storm sashes or screens are drawn into the building for cleaning or repair. Reversely S-curved portion 70 of guide 62 forms a relieved access ramp extending from retaining flange 74 to the first ridge 69, over which the side rail members of the sashes and screens slide easily into place as they are reinstalled.

The positioning of the storm sashes 78 and 80 in their respective track grooves 66 and 68 is clearly illustrated in FIGURE 8, where the side edges of the storm sashes 78 and 80 will be seen to have a curved shape closely conforming to their respective concave track grooves 66 and 68. The convexly-bowed cylindrical-segment shape of the side edges of the two storm sashes corresponds substantially to the mating concavely-arched cylindrical-segment shape of the track grooves 66 and 68, providing convenient self-centered weatherstrip sealing of the storm sashes in the track guide 62. The substantially mating "generating curves" of the side edges and grooves may be polygons, or may be circular arcs, for fabrication convenience, or any other shallow smooth curve desired.

Foot member

The foot 26 is formed as an inverted channel-shaped member best seen in FIGURES 4, 5 and 7. It includes a base web 92 with a downwardly depending face flange 94 along its outer edge and a shorter, downwardly depending inner flange 96 along its inner edge. An upwardly protruding rim 98 extends along the forward edge of the base web 92 at its junction with the downwardly depending face flange 94, and the upwardly extending rim 98 thus forms a continuation of face flange 94. The base web 92 is designed to slant downward toward the outside of the window assembly 20, to allow outward drainage of any water collecting on base web 92, and drainage holes 100 (FIGURES 4, 5) pass through rim 98 from the outer upper surface of base web 92 through the face flange 94 to the outside of the window assembly 20 for the drainage of such collected moisture.

The assembly of channel-shaped foot 26 within the channel-shaped jamb 22 to form the lower corner of the window assembly 20 is shown in FIGURES 4 and 5. Foot 26 is dimensioned to bring the outer surfaces of face flange 94 and inner flange 96 into substantial juxtaposition with the inner surfaces of the outer and inner flanges 54 and 56 of jamb 22. By inserting the ends of foot 26 within the lower ends of jamb 22, these structural members are positioned for assembly by such means as the anchor bolt 102 passing through the overlapping portion of their outer flanges, as shown in FIGURES 4 and 5.

Bolt 102 may be provided with a corresponding nut inside the assembled structural members, or self-tapping metal screws may be employed to join the overlapping flanges of these members 22 and 26. Preformed holes are made ot facilitate the assembly of these structural members, and the inner covered member may be provided with a short horizontal slot, with its horizontal length twice its vertical diameter for example, to allow for a slight horizontal expansible adjustment of the overall window assembly 20 during its erection. Similar assembly slots may be provided in the upper ends of the outer flange 54 of each jamb 22 to permit the same horizontal expansible adjustment of window assembly 20 at its upper corners when members 22 and 24 are bolted together during its erection. Vertical adjustment may be dispensed with if desired, since air space between window assembly 38 and rough opening 40 is fully covered by flashing flange 34 (FIGURES 1, 2).

Storm sash latches

Vertical positioning of the storm sashes in the track guide 62 at desired preselected positions is achieved by the latches 88 and 90 mounted in the lower corners of the sashes 78 and 80.

As shown in FIGURES 8, 9 and 10, the lower rail 104 of the storm sash 80 is provided with a rectangular groove or cavity 106 formed in its lower portion, between an inner wall 114 and an outer wall 118. Mating ribs 108 protrude into the cavity 106 from walls 114 and 118 defining an upper region accommodating angle blocks 110 (FIGURE 10) whose legs are inserted in the upper portion of cavity 106 demarked by ribs 108. The walls of the rail 104 are swaged or crimped inwardly to "stake" angle block 110 in the anchoring position in both rail 104 and side member 112 of storm sash 80, as shown in FIGURE 10. Beneath the ribs 108, the inner wall 114 of the rail 104 is cut away to form an access aperture to the rectangular cavity 106, within which a generally U-shaped latch housing 116 is slidably positioned at each end of rail 104, as shown in FIGURES 8–10. The outer wall 118 of rail 104 is crimped inwardly just beyond the inner end of latch housing 116 to "stake" the latch housing and block its further movement along the cavity 106, as shown in FIGURE 10.

As shown in FIGURES 8 and 9, the U-shaped latch housing 116 has a downward facing opening which rests upon and is closed over most of its length by the base flange 120 of rail 104. The base flange 120 and the exposed side wall of latch housing 116 are both cut away to form a aperture 121 opening both inward and downward in a central portion of the latch assembly 90, as shown in FIGURES 8–10.

An elongated sliding latch 122 is positioned inside latch housing 116 and is provided with a protruding actuator 124 projecting through the aperture 121 formed in latch housing 116 and base flange 120. The latch 122 may be swiveled through an angle of approximately 90° within housing 116 to allow the actuator 124 to protrude either sideways through the aperture 121 portion of latch housing 116, or downwardly through the aperture 121 portion of base flange 120 as indicated respectively in solid and in dashed lines in FIGURE 9. A compression coil spring 126 (FIGURE 10) is positioned between the latch 122 and the staked inner end of latch housing 116, as indicated in dashed lines in FIGURE 10, and this coil spring is normally held in compression, urging latch 122 toward the side member 112 of the storm sash 80. Latch 122 is dimensioned to allow its opposite end, remote from spring 126, to protrude through the end of cavity 106 and latch housing 116, beyond the side member 112. In this "latched" condition, with actuator 124 urged

against the outer end of the aperture **121** portions of base flange **120** and latch housing **116** by the action of spring **126**, latch **122** thus extends a short distance beyond sash **80**. When actuator **124** is moved toward spring **126** by the user, the latch **122** slides within latch housing **116** to compress spring **126**, drawing the protruding end of latch **122** inside the latch housing **116**.

As shown in FIGURE 10, the latch **122** may be aligned with a "dimple" **128**, formed in the shape of a hollow depression in the base of either sash track groove **66** or **68**. A dimple **128** is shown in the lower portion of FIGURE 8, and a dimple **128** is also shown in cross section in FIGURES 7 and 10. When the track guide **62** is formed of a thin stiff plastic material, the dimple **128** may be formed at desired vertical positions in the track grooves **66** and **68** by the application of a heated die shaped like the protruding end of latch **122**.

Thus, as shown in FIGURE 10, protruding latch **122** projects into the selected dimple **128** and the lower rim of dimple **128** blocks downward movement of latch **122**, acting to retain the storm sash **80** in the selected vertical position in its facing pair of track grooves. The dimples **128** in the facing pairs of track grooves are preferably positioned at approximately the same height. A latch **122** in each lower corner of each storm sash can therefore protrude into a corresponding dimple **128** in its track guide **62** to hold both lower corners of the sash in the selected vertical position. Since the screens **82** and **84** are not designed to move vertically in their track groove **64**, they are not provided with latches and no dimples are formed in track groove **64** in the track guide **62**. If either screen is designed to be raised and lowered in its track guide, suitable latches and dimple combinations may be provided in the track guide.

Wide view opening

As shown in FIGURES 1, 2 and 3, the window assemblies **20** of the present invention provide unusually wide view openings through the screens **82** and **84** and the storm sashes **78** and **80**. The jambs **22** are positioned to fit closely within the jamb members of the window frame **36**, so that the top, side and bottom rails of the storm sash and screen members are positioned at the extreme peripheral edges of the window opening, generally juxtaposed with the corresponding members of the conventional double-hung window sashes, the upper sash **130** and the lower sash **132** shown in FIGURE 2. Thus, as indicated in the partially broken-away view of FIGURE 3, the entire width W of the screens and storm sashes is exposed for viewing and admitting light, corresponding substantially to the view opening of the conventional sashes **130** and **132**.

The window assemblies **20** of the present invention thus achieve the numerous advantages described above. They provide quiet trouble-free operation with maximum convenience of assembly and removal of screens and storm sashes for repairs and replacement, together with maximum adjustability of the storm sashes in selected, vertically-displaced positions in their track guides. The self-sealing resilient track guides backed by compressible foam blocks **76** provide unusually good weather-stripping sealing of storm sashes, coupled with maximum sliding convenience of vertical adjustment and maximum view openings. The modular standard sizes of the jambs, foot and head members of these window assemblies may be assembled to accommodate all standard sizes of storm sashes and screens, while their corner adjustment adapts them to fit all standard rough openings of new buildings without the need for caulking. The self-flashing flanges of the jambs and heads and the integral drip cap configuration of the heads provide automatic self-weatherproofing of these window assemblies without the need for flashing.

While the objects of the invention are efficiently achieved by the preferred forms of the invention described in the foregoing specification, the invention also includes changes and variations falling within and between the definitions of the following claims.

I claim:

1. A self-weatherstripped, plural sash window assembly, designed for mounting in a window opening formed in a sheathed building surface and having parallel sides, comprising in combination,

(A) a facing pair of elongated parallel jambs spaced apart to be positioned along opposite parallel sides of the window opening and each having protruding inner and outer flanges facing toward the opposite jamb with inturned retainer rims thereon;

(B) a pair of elongated track guides, each

(1) spanning the space between the flanges of one jamb and having parallel edges fitting behind the inturned rims thereof, and

(2) having a first sash groove and an adjacent second sash groove both concavely-arched in cross-section and substantially parallel to the parallel edges of the track guide;

(C) means spacing the ends of the facing jambs a predetermined distance apart,

(D) a pair of sashes each having convexly-bowed side edges engaging one of the concavely-arched sash grooves of each of the track guides and dimensioned to urge the track guides apart between the jamb flanges and away from the retainer rims thereof,

(E) and depressible resilient means positioned between each track guide and its jamb, urging the track guide toward the bowed side sash edges to produce sliding gripping contact between the arched sash grooves of each track guide and the bowed side sash edges engaged therein,

(F) with the concavely-arched first sash groove and the concavely-arched second sash groove being joined along a smooth continuous ridge formed along their intersection by intersecting planes tangent respectively to each groove at their juxtaposed adjacent edges, with the included ridge angle between these tangent planes being an obtuse angle, whereby the convexly-bowed side edges of each sash may be slidingly transferred from either groove past said ridge into the adjacent groove by forces applied perpendicular to the sash which cause lateral depressible camming displacement of the track guides.

2. The combination defined in claim **1** wherein the jambs and spacing means incorporate flashing flanges protruding away from the sashes and positioned to overlie the margin of the sheathed building surface at the top and sides of the window opening.

3. The combination defined in claim **1** including an integral drip cap protruding outward from the building surface over the window opening.

4. The combination defined in claim **1** wherein each track guide is formed of thin, flexible sheet material deformed in corrugated fashion with alternating ridges and shallow concave grooves extending lengthwise to form said sash grooves, producing stiffness and resistance to arching and buckling in response to loads acting parallel to the direction of the grooves while offering substantially less resistance to arching and buckling in response to loads acting perpendicular to the direction of the grooves, whereby forces acting on the track guide, supplied by the resilient means, produce self-aligning flexural bending of the track guide conforming it to the bowed edges of the sashes in self-sealed weatherstripping relationship.

5. A track guide for the edge of a slidable panel, comprising in combination,

(A) an elongated sheet of thin flexible material deformed in corrugated fashion with at least two shallow concave grooves extending lengthwise flanking an interposed ridge, each such groove being posi-

tioned for sliding engagement with a panel edge aligned therein,

(B) supporting means holding the sheet near the panel edge, and

(C) resilient means, interposed between the supporting means and the sheet urging each groove toward its engaged panel edge, depressible to afford clearance for removal of each panel from its groove by lateral movement of the panel edge past the ridge bounding its groove,

(D) with the ridge interposed between adjacent grooves being a smooth continuous ridge formed by intersecting planes tangent respectively to each groove at their juxtaposed adjacent edges, with the included ridge angle between these tangent planes being an obtuse angle.

6. The combination defined in claim **5** wherein the sheet has an access edge near a first ridge bounding the side of the adjacent concave groove,

(A) with a relieved portion of the sheet forming an access ramp extending from the access edge to the first ridge,

(B) and with both the access ramp and the access edge being displaced away from the panel edge to facilitate its removal and replacement.

7. The combination of the track guide defined in claim **5** with a slidable panel, including

(A) means forming at least one latching rim formed in the sheet material at a preselected position,

(B) and a latch mounted on the panel in alignment with the latching rim and resiliently biased into engagement therewith at a predetermined latched position of the panel.

8. The combination defined in claim **7** wherein each latching rim is defined by means forming an offset dimple deforming a portion of the sheet material without interrupting its continuity.

9. The combination defined by claim **7** wherein each latching rim is formed in the base of one of the shallow concave grooves.

10. The combination defined in claim **7** wherein the latch is formed as an elongated shaft slidably mounted within a tubular latch housing forming part of the panel.

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