Feb. 24, 1953 S. SPECTOR ET AL 2,629,143

STORM WINDOW

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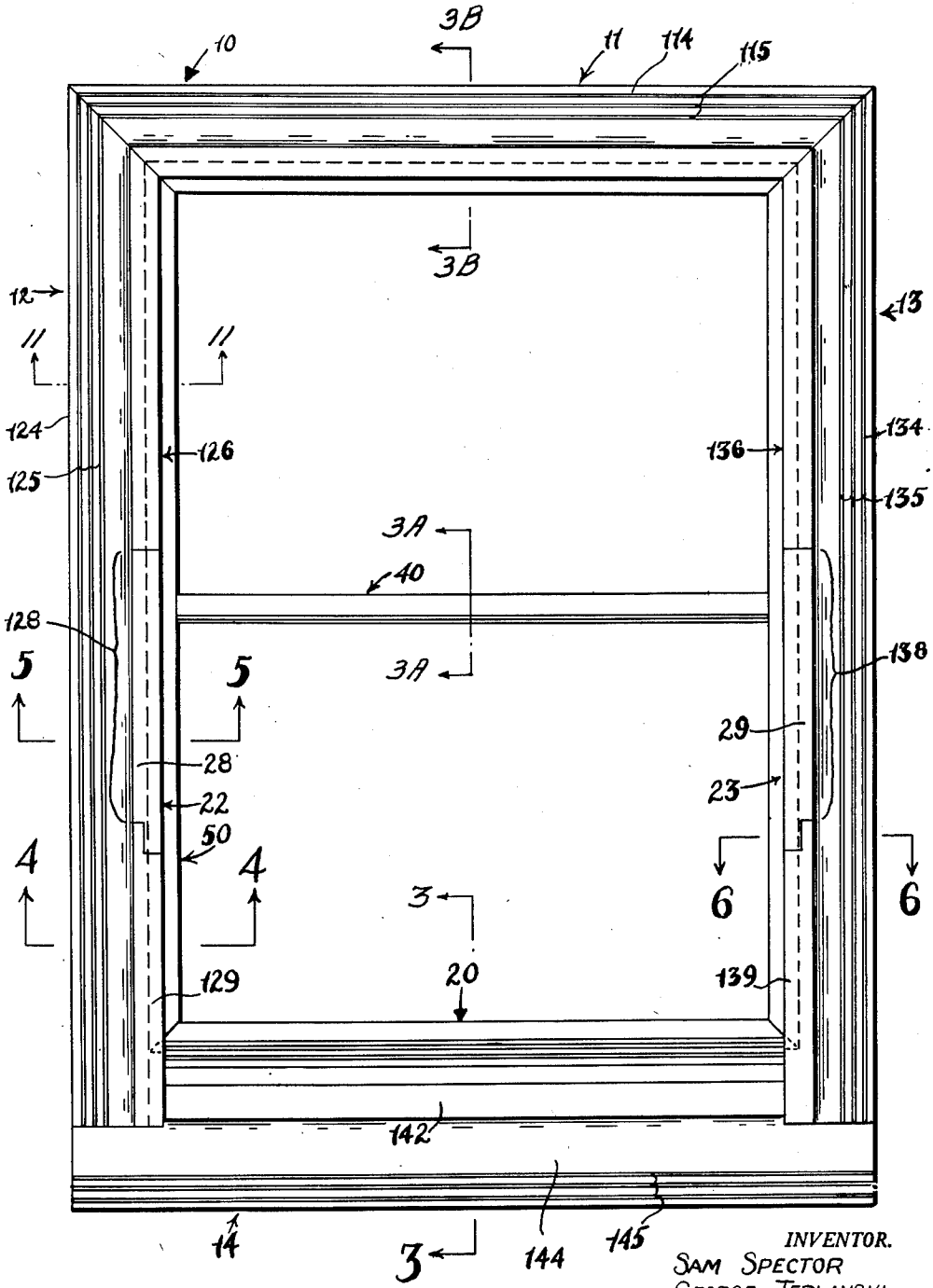

Fig. 1.

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STORM WINDOW

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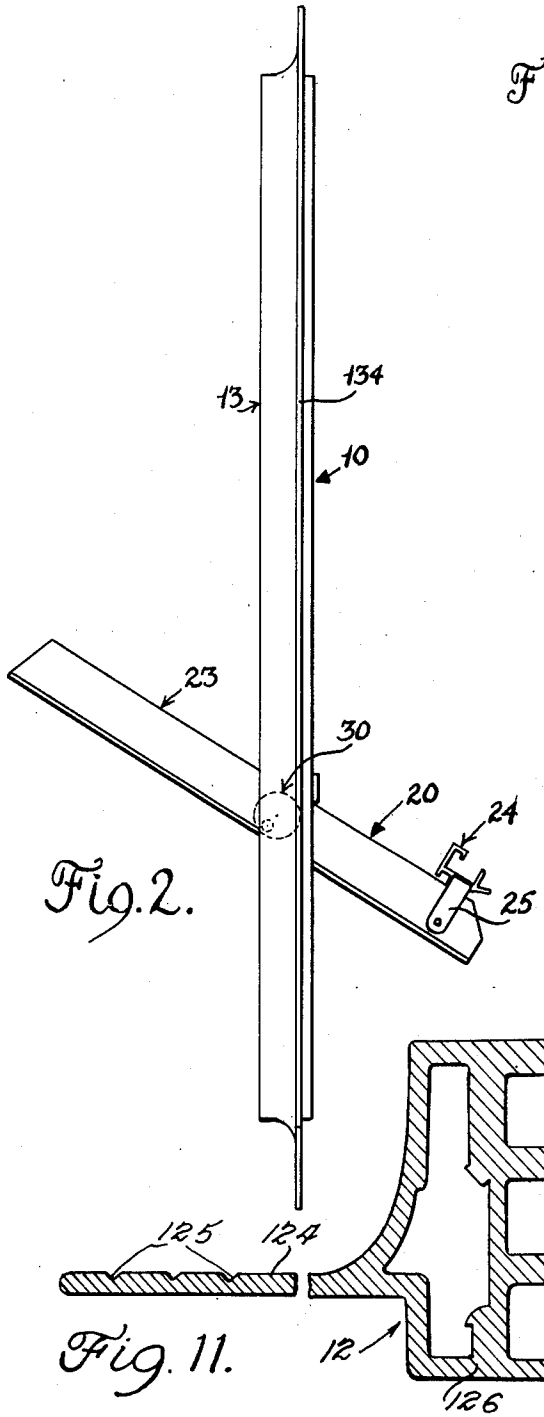
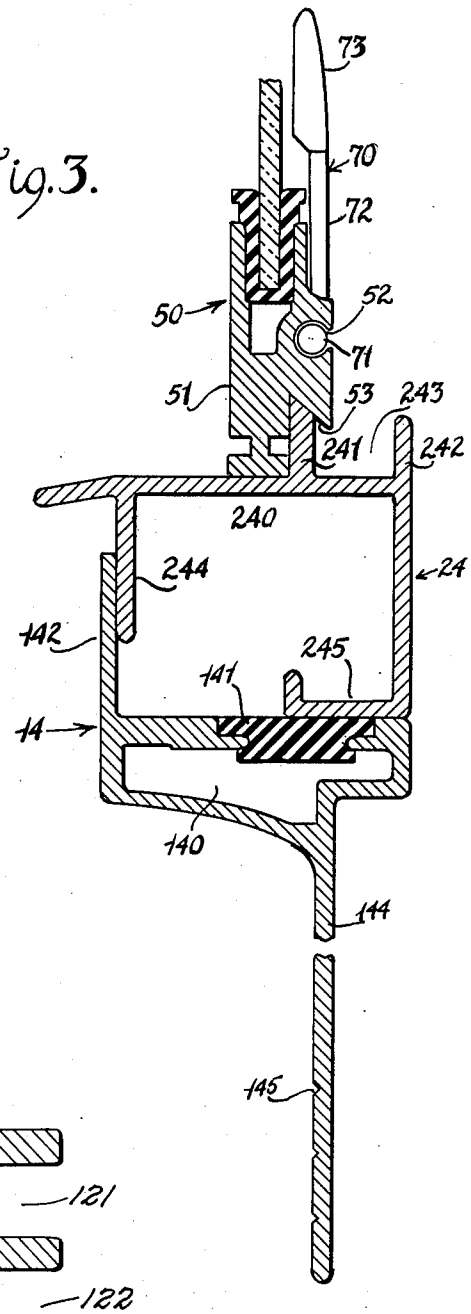


Fig. 2.

Fig. 11.

Fig. 3.



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STORM WINDOW

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Fig. 4.

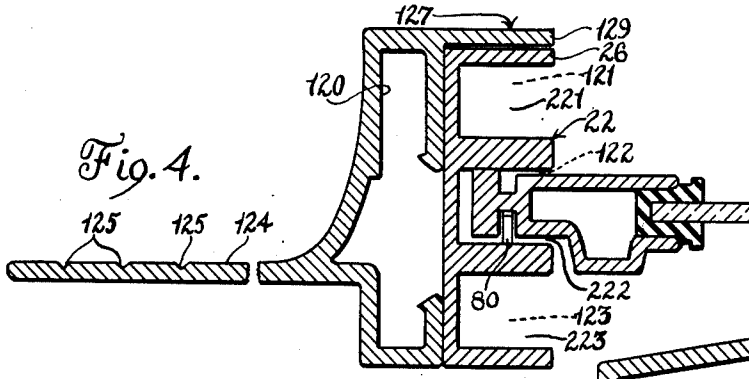


Fig. 5.

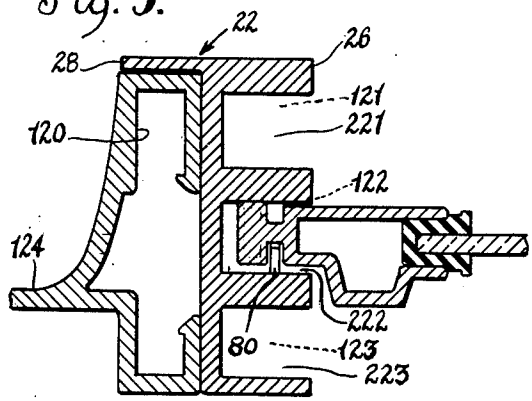


Fig. 6.

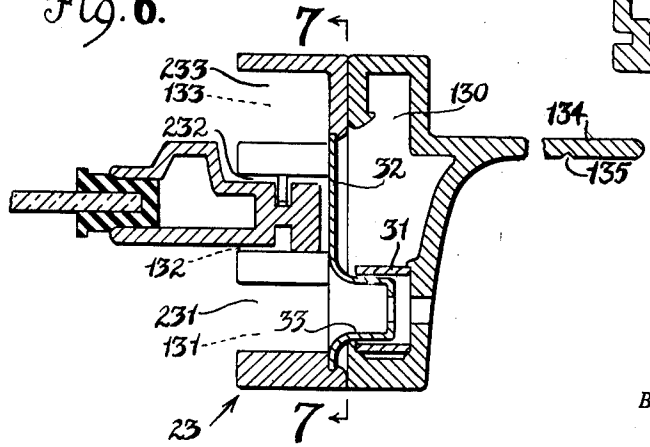
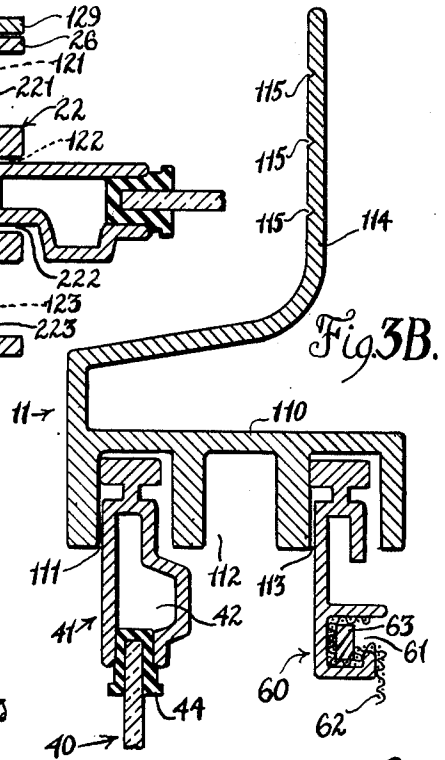


Fig. 3B.



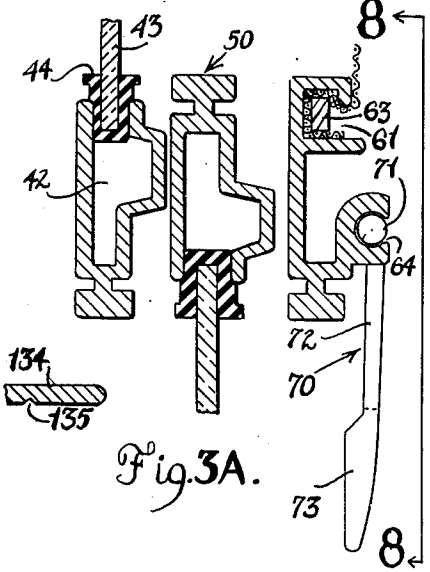


Fig. 3A.

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STORM WINDOW

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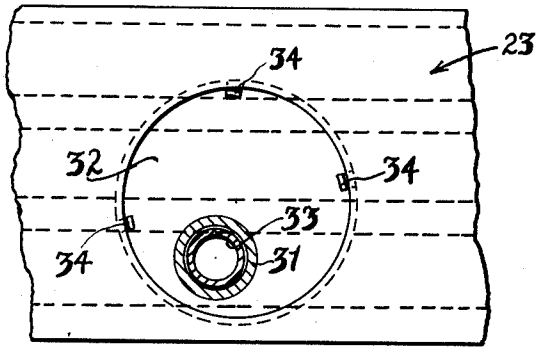
Fig. 7.



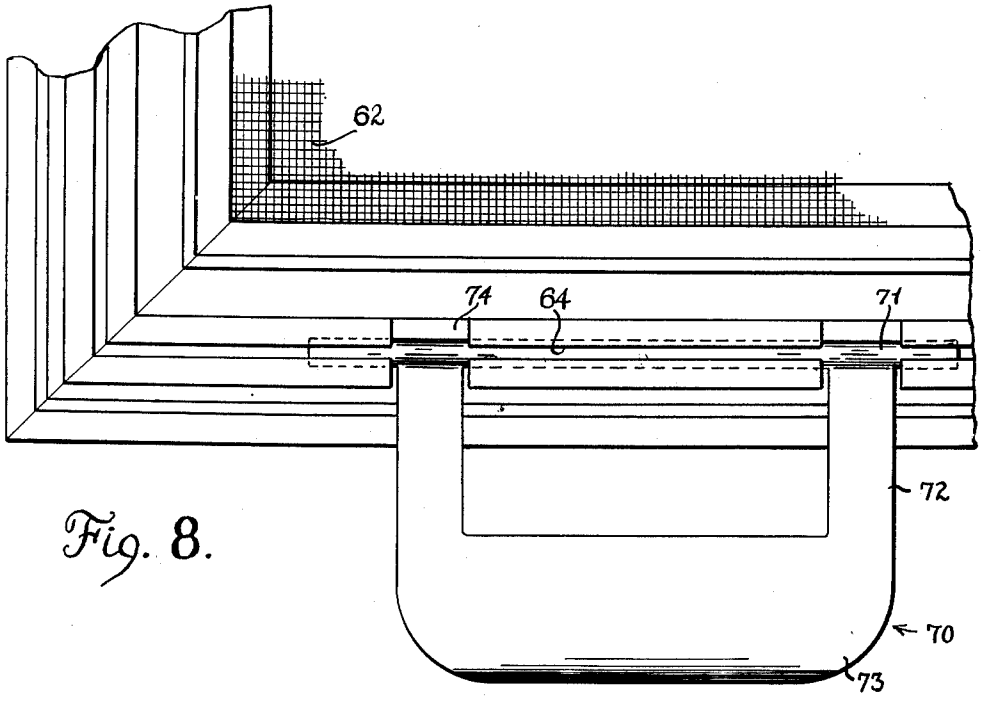


Fig. 8.

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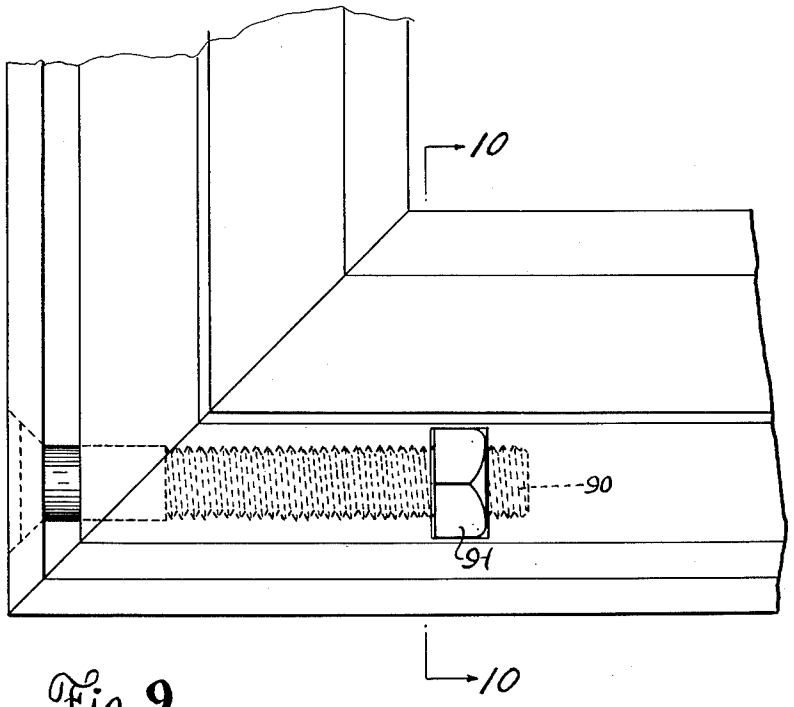

Fig. 9.

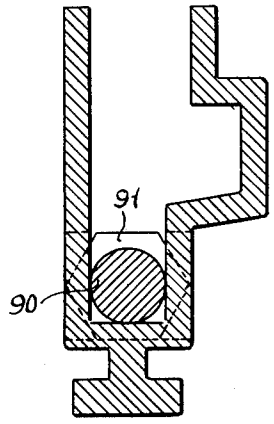

Fig. 10.

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Patented Feb. 24, 1953

2,629,143

UNITED STATES PATENT OFFICE

2,629,143

STORM WINDOW

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Application April 6, 1949, Serial No. 85,746

4 Claims. (Cl. 20—55)

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This invention relates to improvements in storm windows, and, particularly, storm windows of the permanent "self-storing" type provided with an upper glazed sash and a sliding lower glazed sash which may be raised or "stored" during the summer-time to provide an opening in the lower half of the storm window frame; this opening may be screened with a sliding screened sash, which is adapted to be raised or "stored" during the winter-time, when the lower glazed sash is in use.

It is an advantage of storm windows made according to our invention that they may be made of extruded metal, preferably aluminum, having channel or box sections, thereby providing the permanence and strength of metal while being lightweight for shipping and handling and economical to produce. Storm windows made according to our invention are closely fitting, and may be produced for closer tolerances than has been heretofore possible with wood or metal storm windows of the "self-storing" type.

Because of the close fits necessary to obtain the desirable wind-tightness in storm windows, the so-called self-storing storm windows heretofore available have not satisfied this need. Such failure has been attributable largely to the fact that the prior art storm windows have had to be "custom built," i. e. made on special order and fitted on the job in order to compensate or correct for the inevitable warped, misaligned and/or out-of-plumb construction inevitably found in the casings of windows in wood or masonry buildings. The carpentry or tinsmith work involved in fitting prior art wood or metal storm windows not only was very expensive but could not equal the close-tolerance precision construction of our windows. Our storm windows may be either cut and built to stock sizes in the factory or cut, in the factory, shipped, knocked-down, and assembled on or near the site of installation. Though our storm windows are preferably produced in stock sizes, such stock-size storm windows may be easily fitted to the wood or masonry casing of a window, despite the variations normally found in such window casings. This substantial advantage is obtained by providing an integral "waste strip" or flange around the frame of our storm windows.

It is another object and advantage of our storm windows that all the sliding sash may be easily removed for cleaning and such removal may be accomplished from inside the building on which the storm windows are fitted and permanently mounted. We accomplish this object by providing a tiltable sash which may receive the aforesaid sliding sashes and then may be tilted to project the bottom portions of said sliding sash into the room on which the window opens. Except when all said sliding sashes are in a position permitting such removal, the tiltable sash is locked.

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It is another object and advantage of our invention to provide a novel adjustable pivot construction for the aforesaid tiltable sash which, after adjustment to fit the tiltable sash precisely in the frame, may then be permanently and securely locked in its adjusted position.

Another object of this invention is to provide a simple and convenient swingable handle construction permitting the sliding sash to be raised and lowered in the storm window frame.

A still further object of this invention is to provide a novel corner construction for the sliding sash providing a strong sash corner and simultaneously providing sufficient flexibility to prevent the glass carried thereby from being broken during use.

Other and further objects and advantages of this invention will be apparent from the following specification, claims, and drawings, in which

Fig. 1 is an outside, front elevation of a storm window made according to our invention.

Fig. 2 is a side elevation of the structure shown in Fig. 1, but with the tiltable sash tilted inwardly and the sill of said sash swung open to a position permitting the sliding sashes carried thereby to be removed therefrom.

Fig. 3 is an enlarged sectional detail of the sill construction taken along the line 3—3 of Fig. 1.

Fig. 3A is an enlarged sectional detail of the center of the storm window taken along the line 3A—3A of Fig. 1.

Fig. 3B is an enlarged sectional detail of the lintel of the storm window taken along the line 3B—3B of Fig. 1.

Fig. 4 is an enlarged sectional detail of the jamb of the window, taken along the line 4—4 of Fig. 1.

Fig. 5 is another enlarged sectional detail similar to Fig. 4, but taken along the line 5—5 of Fig. 1.

Fig. 6 is an enlarged sectional detail of the adjustable pivot, taken along the line 6—6 of Fig. 1.

Fig. 7 is a detail elevation, taken along the line 7—7 of Fig. 6, showing the pivot pin disk.

Fig. 8 is a detail elevation, taken along the plane of the line 8—8 of Fig. 3A, showing in detail the handle-mounting construction and the corner construction of the sash.

Fig. 9 is a phantom detail view of the sash corner construction.

Fig. 10 is a sectional view taken along the line 10—10 of Fig. 9 showing further detail of the sash corner construction.

Fig. 11 is an enlarged sectional detail of the jamb of the window similar to Figs. 4 and 5 but taken along the line 11—11 of Fig. 1.

Referring to the drawings, in which like reference characters refer to like parts, our storm window is comprised of a frame, referred to generally by the reference character 10. The frame 10 is comprised of a channeled lintel member 11, channeled jamb members 12 and 13, and a sill member 14, all being preferably formed of extruded or rolled aluminum or like corrosion-resistant metal to provide the strong and rigid box or channel sections disclosed in the several detail views and discussed below. Although the frame members 11, 12, 13 and 14 are of a complex cross-section, they are formed economically and accurately either by the extrusion of molten aluminum or like metal through suitable extrusion dies or by rolling the section from coiled strip. Long lengths of such extruded stock may be cut with hack saws to window lengths, which window lengths may be routed in milling machines where modification of the cross-section in certain portions of such window lengths is required.

Specifically, the lintel 11 is cut to the window length required from extruded deep channeled stock of the cross-section shown in Fig. 3B of the drawings. Such lintel stock comprises, in cross-section, a body portion 110 having sash-receiving channels 111, 112, and 113 and an integral, outwardly-extending flange or "waste-strip" 114 provided with the parallel break-off grooves 115. In the particular embodiment shown, the ends of the window lengths of the lintel stock are suitably mitered to form the mitered joints with the jambs 12 and 13, as shown.

The jambs 12 and 13 are each formed from lengths of extruded stock of the same cross-section, each such window length being mitered at one end to form the mitered joints with the lintel 11 and the preferred butt joints with the sill 14. Fig. 11 shows the unmodified cross-sections of the jambs in their upper portions 126 and 136. Equivalent cross-sections are shown by the combined areas of the portion of the jamb 12 and the portion of the tiltable sash jamb 22 shown in Fig. 4, or the combined areas of the portion of the jamb 12 and the tiltable sash jamb 22 shown in Fig. 5, or the combined areas of the portion of the jamb 13 and the portion of the tiltable sash jamb 23 shown in Fig. 6. It will be noted that the configuration of all of said combined cross-sectional areas is identical. The jamb 12, therefore, is comprised of a box portion 120 having sash receiving channels 121, 122, and 123 (indicated by dash reference lines in Figs. 4 and 5), and an integral flange of "waste-strip" 124 provided with parallel break-off grooves 125. The jamb 13 likewise has a box body 130 having sash receiving channels 131, 132, and 133 and an integral waste-strip 134 provided with break-off grooves 135.

It should be noted that the waste strips 124 and 134 of the jams 12 and 13 occupy the same relative positions with respect to their sash receiving channels as the waste strip 114 of the lintel 11 occupies with respect to its sash-receiving channels, so that, when the lintel 11 and jambs 12 and 13 are joined with their respective sash-receiving channels in alignment, the waste strips 124, 114, and 134 will form a continuous grooved fin around the top and sides of the frame 10.

The walls defining the channels 122 and 123 of the jamb 12 are milled off or otherwise removed below the upper portion 126 in order to permit the frame jamb 12 to receive the jamb 22 of the tiltable sash 20. The front wall 127 of the frame jamb channel 121 is also removed completely for a distance below the portion 126 in order to provide a stepped opening 128 for the sealing fin 28 of the tiltable sash jamb 22. Below the opening 128, only the rear of the wall 127 is milled off, thereby providing a sealing fin 129 on the jamb 12. The jamb 13 is likewise milled to provide an opening 138 and a sealing fin 139.

As is evident from the foregoing, the jambs 12 and 13 carry the tiltable sash 20, which is comprised of the channeled jambs 22 and 23 and the swingable sill 24, hinged on the jambs by means of the hinge straps 25 pivoted on the jambs 22 and 23. The jamb 22 may be milled out of a length of stock from which the jambs 12 and 13 are formed, but preferably the jamb 22 is cut from lengths of extruded stock having the cross-section of the jamb 22 as shown in Fig. 5. The jamb 22 has sliding sash-receiving channels 221, 222, and 223 corresponding to the channels 121, 122, and 123 of the jamb 12. The front wall 26 of the channel 221 is extruded with a sealing fin 28, but except for the portion received in the opening 128 of the jamb 12, the fin 28 and the corresponding portion of the front wall 26 are milled off to permit the jamb 22 to fit and seat in the jamb 12 behind the sealing fin 129, as shown in Fig. 4. The tiltable sash jamb 23 is likewise provided with a sealing fin 29 adapted to be received in the opening 138 and is milled to seat behind the fin 139 of the jamb 13. The jamb 23, being of a similar configuration as jamb 22, is also provided with sash-receiving channels 231, 232, and 233 which normally align with the corresponding channels 131, 132, and 133 of the jamb 13.

The sash 20 is pivoted in the jambs 12 and 13 by means of the pivots 30. The tops of the jambs 22 and 23 are cut on an angle (which mates with the bottom of the upper portions 126 and 136 of the jambs 12 and 13) which permits the sash 20 to pivot only from an aligned position in the frame 10 to a position in which the top of the sash 20 is swung outwardly and the bottom is swung inwardly, as shown in Fig. 2. The pivots 30 are comprised of hardened steel bushings 31 and pivot disks 32 provided with eccentric bosses 33, as shown in Fig. 6. The bushings 31 are received in suitable sockets drilled in the jambs 12 and 13 at the center of the steps of the openings 128 and 138. The pivot disks 32 are received in shallow sockets drilled in the back of the jambs 22 and 23. The edges of these sockets are then spun over to hold the pivot disks 32 rotatably in the sockets.

Although the jambs 12, 13, 22, and 23 are preferably milled in suitable jigs to maintain uniformity, in actual production, variations from piece to piece and accumulation of deviations within permissible production tolerances will not insure that the tiltable sash 20 will always fit precisely in the frame 10, nor will the sliding sash receiving channels of the several jambs always align precisely immediately upon assembly, if the pivots 30 were not adjustable. To adjust the pivots 30 so that the sash 20 will fit and swing properly in the frame 10, the pivot disks 32 are simply rotated in their sockets until the eccen-

tricity of the bosses 33, rotating in the bushings 31, throws the sash 20 into proper position in the frame 10.

To lock the pivots 30 in their adjusted position, the pivot disks 32 are provided with a plurality of tabs 34 spaced about the periphery of the disks 32 so that in any adjusted position, at least one of the tabs will be located over a channel wall in the jamb carrying the disk. With the disk 32 rotated to its adjusted position, the tabs 34 are driven inwardly to rivet at least one in the deep sections of metal provided by the channel walls.

With the sash 20 mounted in the jambs 12 and 13, the sliding glazed sashes 40 and 50 and the sliding screened sash 60 are slid into the channels of the jambs, the two glazed sashes being adjacent each other and the screened sash preferably being in the inner channels. The sill 24 may then be swung to its normal position closing the end of the jambs 22 and 23.

Figure 3 shows that the sill 24 is comprised of a length of extruded stock having a substantially box section and comprised of a sill portion 240 having a beveled sealing ridge 241 which, with the ridge 242, defines a screened sash-receiving channel 243. The sill portion 240 carries a dependent sealing fin 244 and a seating fin 245.

As a final assembly operation, the sill 14 is joined to the jambs 12 and 13. The sill 14 comprises a hollow body or box portion 140 having a slot adapted to receive a rubber sealing strip 141 which engages the seating fin 245. The body portion 140 carries a sealing fin 142 which is engaged by the fin 244 of the sill 24. The body portion 140 also carries the integral waste strip 144 provided with break-off grooves 145. The length of the extruded stock from which the sill 14 is cut is milled at the ends to permit the body portion 140 to be received between the jambs 12 and 13 and the waste strip 144 is notched, as shown in Fig. 1, to receive the ends of the jambs 12 and 13. The notches in the thin waste strip 144 are easily trimmed, as by filing, to compensate for any accumulation of manufacturing tolerance and to permit the sill 14 to seat firmly on the seating fin 245 of the sill 24.

The glazed sliding sash 40 is comprised of a frame of extruded metal stock 41 having a deep glass-receiving channel 42 in which the light 43 is received, being supported and sealed therein by means of the compressed rubber glazing channels 44. The glazed sliding sash 50 is similar to the sash 40, except that this embodiment is shown with a bottom member 51 provided with a circular groove 52 adapted to receive a swinging handle 70 as may be seen in Figure 3; the member 51 is also provided with a weather-stripping groove 53 adapted to seat on the beveled ridge 241 of the sill 24 when the sash 50 is in its lowered position.

The screened sliding sash 60 is comprised of a frame of extruded stock having a cross-section as shown in Figs. 3A and 3B and provided with an inwardly opening channel 61 in which the screening 62 may be locked by the locking wire 63. The bottom member of the frame of the sash 60 is also provided with a groove 64 adapted to receive a swinging handle 70.

The handles 70 are hinged very simply in the sliding sashes. The handles 70 are punched out of extruded stock having a cross-section similar to that of the end views of the handles as shown in Figs. 3 and 3A. By punching out a center area bounded by the hinge pin portion 71, the straps 72 and the grip portion 73, and simultaneously punching away an area bounded by the hinge pin portion, the straps 72 and the ends of the length of stock, a handle 70, as shown in Fig. 8, is formed. To mount the handle in the sash, strap-receiving slots 74 are milled across the handle receiving grooves in the sashes. The hinge pin portions of the handles are then fitted in the receiving grooves and slid in from an end of the sash frame until the straps can fall in the slots 74; then the edges of the groove are peened over to lock the handles in place along the length of the groove. The handles are then free to swing from a dependent position, as shown in Fig. 3A to a raised position, as shown in Fig. 3.

To hold the several sashes frictionally in their raised positions and also to press the sashes against the forward walls of the sash-receiving channels in order to seal the tolerance allowed between the sash and channels and to prevent rattling, the portions of the sash frames sliding in the channels are grooved to receive leaf-spring wires 80, as shown in Figs. 4 and 5.

A very simple and novel corner construction for the sliding sashes is shown in Figs. 9 and 10. The frame members fit with a mitered joint, as shown, one member being drilled and countersunk to permit a screw 90 to extend into the channel of the other frame member. The walls of the other member are slotted to receive a nut 91 which receives the screw 90. Tightening the screw 91 jams the mitered surfaces together and any tendency to spring the joint is resisted by the tensile strength of the screw. At the same time, the screw does not prevent one frame member from pivoting with respect to the other and thereby providing a flexible frame. It has been discovered that such a flexible frame reduces breakage of the glass which may be mounted in it due to sudden shocks, the rubber glazing strips permitting slight movement of the glass in the frame. The flexible corner construction permits the glass to flex and flex other portions of the frame when one corner or portion of the frame is distorted. It has been found that a rigid corner construction will hold the glass rigidly and, thereby, increase the danger of glass breakage.

Operation

Storm windows constructed and assembled as above described are preferably made up in stock sizes in which the width of the tilting sash 20 is somewhat less than the sash opening of the window on which it is to be mounted. This is to permit sash 20 to tilt into the room on which the room window opens. The proportions of the several waste strips 124 and 134 are then such that their total width will exceed the width of the opening between the casing jambs in any stock window casings. The height of a storm window is also selected that the waste strips 114 and 144 will exceed the height of the opening between the sill and the lintel of the window casing. To fit the storm window, all that need be done is to break off the waste strips along the break-off grooves 115, 125, 135, and 145 until waste strips fit against the blind stops of the casing. The waste strips are then drilled and screwed to the casing.

When mounted and employed as a storm window to insulate the room window, the sliding sash 40 is raised and the sash 50 is lowered, and the screened sash is raised or "stored," as shown in Figs. 1, 3A and 3B. For summer use, the sash 50

is simply raised or "stored" and the screened sash 60 is lowered. It will be noted that the parting line between the upper portions 126 and 136 of the jambs 12 and 13 and the tiltable sash 20 is above the bottom of the sash 40. Thus, the height of each sliding sash being greater than the height of the upper portions of the jambs 12 and 13, when any one of the sashes is raised, the tiltable sash 20 is automatically locked against tilting.

To remove the sliding sashes for washing, all sashes are lowered into the tiltable sash 20, care being taken to swing the handles 70 upwardly. The tiltable sash 20 may then be tilted and the sill 24 swung open, as shown in Fig. 2, to permit the sliding sashes to be removed into the room on which the window opens.

While we have disclosed a preferred and tested embodiment of our storm windows, it is understood that the specific embodiment disclosed may be varied without departing from the scope of our invention as defined in the following claims.

What is claimed is:

1. A self-storing storm window comprising a frame comprised of a sill, lintel and parallel frame jambs having sliding-sash receiving channels solely in the inner surfaces of the upper portions thereof, sliding-sash mountable in said channels, parallel tiltable sash jambs between and in closely fitting relationship with said frame jambs, pivot means between said tiltable sash jambs and said frame jambs providing for the tilting of said tiltable sash jambs to a normally closed position of vertical alignment with said frame jambs, said tiltable sash jambs having sliding-sash receiving channels in the inner surfaces thereof vertically aligned with the channels of said frame jambs when said tiltable sash jambs are in said closed position, the height of said tiltable sash jambs being greater than the height of any of said sliding-sash, whereby all of said sliding-sash may be slid into said tiltable sash jambs, said pivot means also providing for the tilting of said tiltable sash jambs so that the lower portions thereof project inwardly of said frame when all of said sliding-sash is slid into said tiltable sash jambs, and so that the channels in the tiltable sash jambs are clear of said sill of said frame and said sliding-sash may be slid out of the bottom of said tiltable sash jambs and into the room on which said storm window opens when said storm window is mounted.

2. A self-storing storm window comprising a frame comprised of a sill, lintel, and parallel frame jambs having sliding-sash receiving channels solely in the inner surfaces of the upper portions thereof, sliding-sash mountable in said channels, parallel tiltable sash jambs between and in closely fitting relationship with said frame jambs, pivot means between said tiltable sash jambs and said frame jambs providing for the tilting of said tiltable sash jambs to a normally closed position of vertical alignment with said frame jambs, said tiltable sash jambs having sliding-sash receiving channels in the inner surfaces thereof vertically aligned with the channels of said frame jambs when said jambs are in said closed position, the height of said tiltable sash jambs being greater than the height of any of said sliding-sash, whereby all of said sliding-sash may be slid into said tiltable sash jambs, said pivot means also providing for the tilting of said tiltable sash jambs so that the lower portions thereof project inwardly of said frame when all of said sliding-sash is slid into said tiltable sash jambs, and so that the channels in the tiltable sash jambs are clear of said sill of said frame and said sliding-sash may be slid out of the bottom of said tiltable sash jambs and into the room on which said storm window opens when said storm window is mounted, said pivot means including a rotatable pivot member, an eccentric pivot pin on said rotatable member, a journal on which said pin is mounted, whereby said member may be rotated to adjust the position of said tiltable sash jambs in said frame, and means to lock said member in its adjusted position.

3. A self-storing storm window comprising a frame comprised of a sill, lintel, and parallel frame jambs having sliding-sash receiving channels solely in the inner surfaces of the upper portions thereof, sliding-sash mountable in said channels, parallel tiltable sash jambs between and in closely fitting relationship with said frame jambs, pivot means between said tiltable sash jambs and said frame jambs providing for the tilting of said tiltable sash jambs to a normally closed position of vertical alignment with said frame jambs, said tiltable sash jambs having sliding-sash receiving channels in the inner surfaces thereof vertically aligned with the channels of said frame jambs when said jambs are in said closed position, the height of said tiltable sash jambs being greater than the height of any of said sliding-sash, whereby all of said sliding-sash may be slid into said tiltable sash, said pivot means also providing for the tilting of said tiltable sash jambs so that the lower portions thereof project inwardly of said frame when all of said sliding-sash is slid into said tiltable sash jambs, and so that the channels in the tiltable sash jambs are clear of said sill of said frame and said sliding-sash may be slid out of the bottom of said tiltable sash jambs and into the room on which said storm window opens when said storm window is mounted, a fin on each of said tiltable sash jambs extending from the location of the axis of said pivot member upwardly and a fin on each of said frame jambs extending downwardly from the axis of said pivot means, said fins overlapping the joint between said tiltable sash jambs and said frame jambs to seal the same.

4. A self-storing storm window comprising a frame comprised of a sill, lintel, and parallel frame jambs having sliding-sash receiving channels solely in the inner surfaces of the upper portions thereof, sliding-sash mountable in said channels, parallel tiltable sash between and in closely fitting relationship with said frame jambs, pivot means between said tiltable sash jambs and said frame jambs providing for the tilting of said tiltable sash jambs to a normally closed position of vertical alignment with said frame jambs, said tiltable sash jambs having sliding-sash receiving channels in the inner surfaces thereof vertically aligned with the channels of said frame jambs when said jambs are in said closed position the height of said tiltable sash jambs being greater than the height of any of said sliding-sash, whereby all of said sliding-sash may be slid into said tiltable sash, said pivot means also providing for the tilting of said tiltable sash jambs so that the lower portions thereof project inwardly of said frame when all of said sliding-sash is slid into said tiltable sash jambs and so that the channels in the tiltable sash jambs are clear of said sill of said frame and said sliding-sash may be slid out of the bottom of said tiltable sash jambs and into the room on which said storm window opens when said storm window is mounted, and cooperating means on said parallel frame jambs and said tilt-

able sash jambs to effect weather tight closure therebetween when said tiltable sash jambs are in their aligned position.

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GEORGE J. TEPLANSZKI.

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1,998,315	Glaser	Apr. 16, 1935
2,015,447	Esser	Sept. 24, 1935
2,031,875	Dobie	Aug. 25, 1936
2,050,003	Glowacky	Aug. 4, 1936
2,301,627	Kaufmann	Nov. 10, 1942
2,405,112	Carroll	Aug. 6, 1946
2,430,772	Kammerer	Nov. 11, 1947
2,467,511	Van Fleet	Apr. 19, 1949