Aug. 19, 1958 R. A. GILLESPIE 2,847,727

STORM SASH

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Fig. 1.

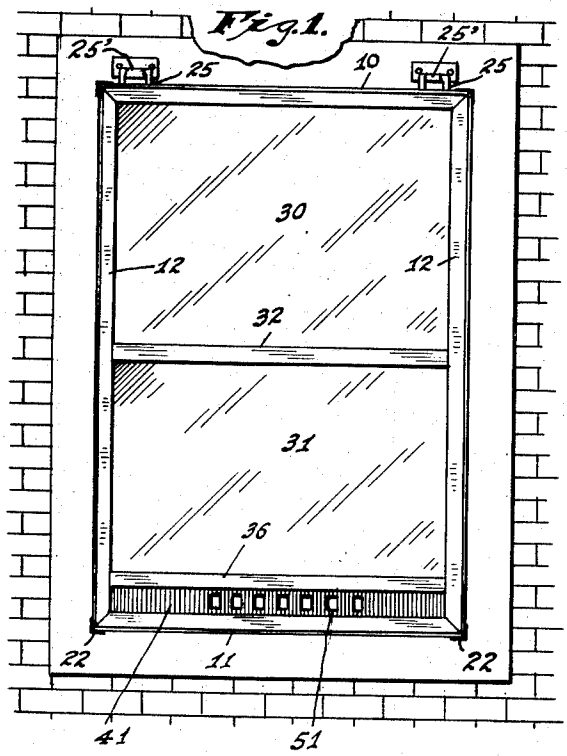



Fig. 2.

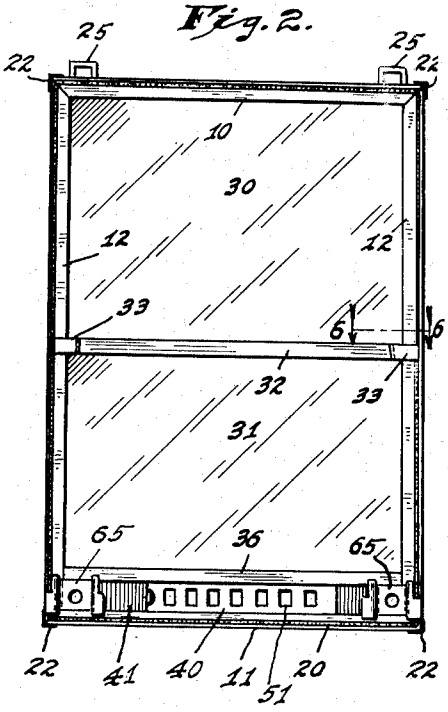



Fig. 3.

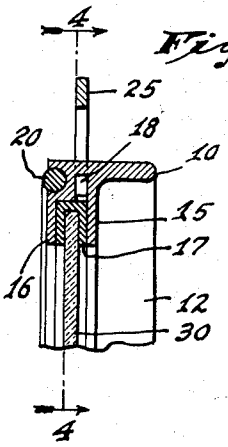



Fig. 4.

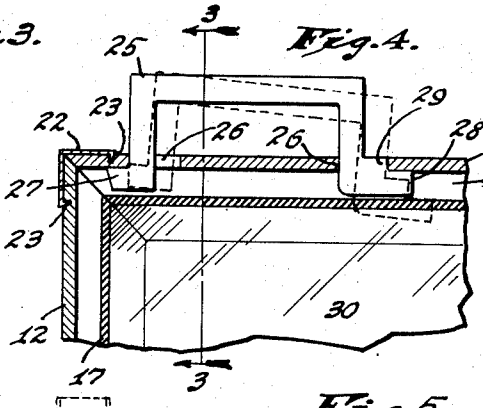



Fig. 6.

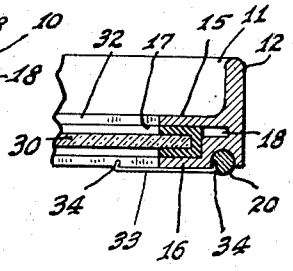
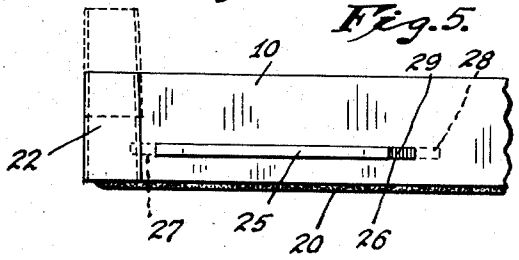



Fig. 5.




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Fig. 7.

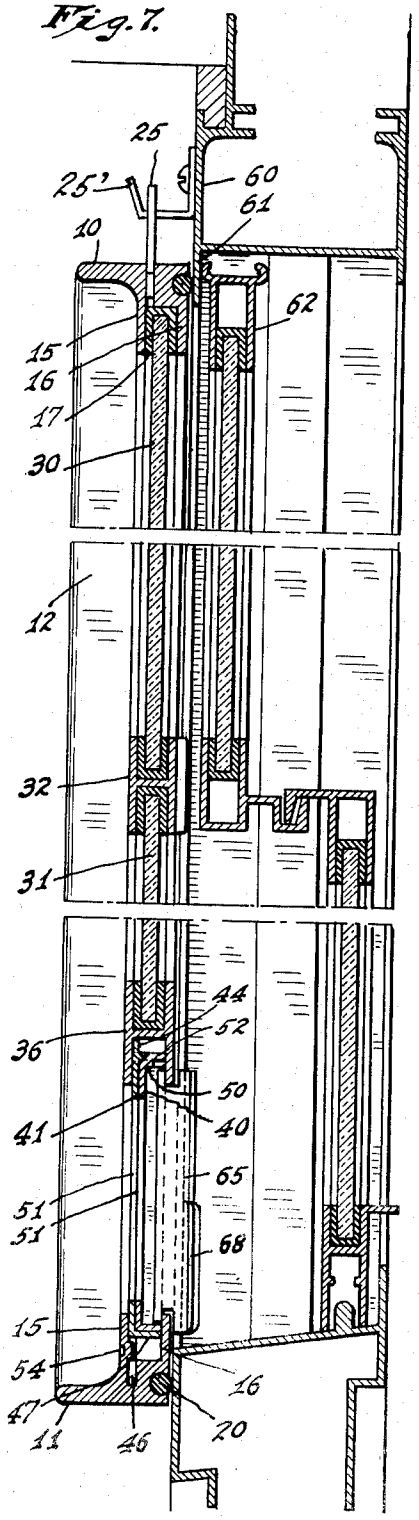



Fig. 8.

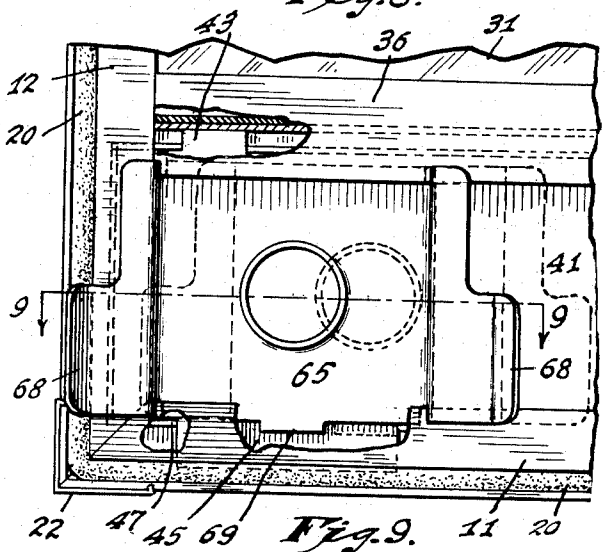



Fig. 9.

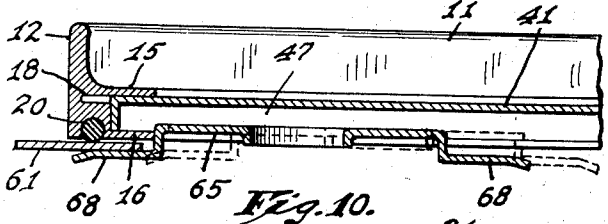
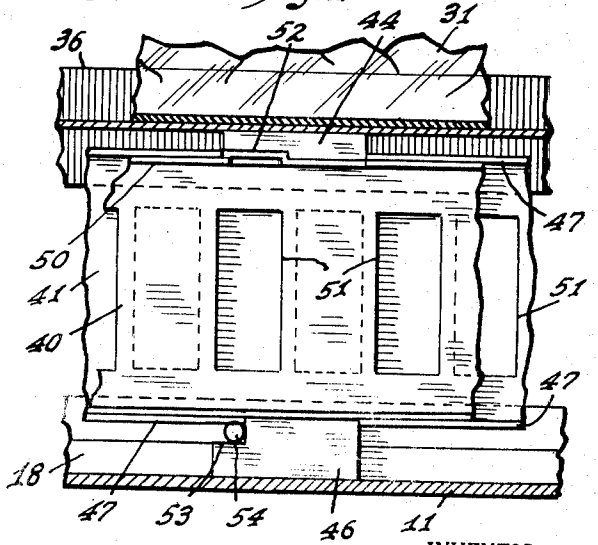



Fig. 10.




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# STORM SASH

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Application April 26, 1954, Serial No. 425,434

9 Claims. (Cl. 20—55)

This invention relates to storm sash, and more particularly to metal-frame storm sash. Its principal object is to improve the structure, reduce the cost, and facilitate the assembly of such sash.

In carrying out the invention in its preferred form, the rectangular border frame of the sash is constructed of extruded metal strip having in one side a groove for reception of the glass. At each corner of the frame the meeting rails are mitered and held together by a sheet-metal clip which extends around the corner and is provided at its edges with in-turned flanges received in transverse grooves extending across the outer faces of the rails. The grooves and flanges are disposed at a slight oblique angle so that when the clip is forced into the grooves by movement perpendicular to the plane of the sash the meeting rails will be drawn tightly together.

If, as is usually desirable, a sash is to incorporate a plurality of panes of glass, adjacent panes are separated by a muntin. The muntin may be an extruded metal strip of H-shaped cross-section having its ends abutting against the inner face of the border frame. To secure each end of the muntin to the adjacent rail of the frame, I prefer to employ a sheet-metal clip having along opposite edges flanges received in grooves in the muntin and side rail. Desirably, the grooves and clip-flanges depart slightly from parallelism so that as the clip is forced home by movement transverse to the muntin the end of the muntin will be drawn tightly against the side rail. Rail-grooves which receive the clip-flange may extend continuously throughout the periphery of the frame to receive a seal bearing against the window frame when the storm sash is in place.

Hangers for supporting the sash from the conventional hooks at the top of the window frame may take the form of sheet-metal stampings which extend through slots in the upper rail of the sash frame. The lower ends of such hangers are provided with ears which prevent upward withdrawal of the hangers through the slots, and the hangers are held in place by the glass received in the upper rail.

If desired, the storm sash may include a ventilator comprising fixed and movable plates having openings which can be positioned in or out of alignment with each other in sliding movement of the movable plate. If a ventilator is provided the lower pane of glass in the sash does not extend to the lower border frame but is received in a glazing rail similar to the muntin, and the ventilator plates are supported between such glazing rail and the lower sash rail. The lower glazing rail and the lower sash rail may also support sliding locking plates for holding the sash in position on an associated window frame.

The accompanying drawings illustrate the invention:

Fig. 1 is an exterior elevation showing a storm sash in place on a window frame;

Fig. 2 is an elevational view of the inner face of a storm sash;

Fig. 3 is a fragmental vertical section on the line 3—3 of Fig. 4 through the upper portion of the sash;



Fig. 4 is a fragmental vertical section on the line 4—4 of Fig. 3 illustrating the hanger-mounting and the corner construction;

Fig. 5 is a fragmental plan view of the construction shown in Fig. 4;

Fig. 6 is a horizontal section through a side rail on the line 6—6 of Fig. 2;

Fig. 7 is a vertical section through the complete storm sash and an associated window frame;

Fig. 8 is an elevational view of a lower corner of the storm sash, showing the lock by which the sash is held in place;

Fig. 9 is a horizontal section on the line 9—9 of Fig. 8; and

Fig. 10 is a fragmental elevation of the inner face of the storm sash near the center of the bottom thereof, portions of the construction being broken away.

The storm sash shown in the drawing comprises an upper rail **10**, a bottom rail **11**, and side rails **12** assembled to form a rectangular frame. Conveniently, all rails are of identical cross-section such as is illustrated in Figs. 3, 6, and 7 and may be lengths of extruded aluminum or other appropriate metal. As shown, the stock from which the side rails are cut is provided with spaced inner and outer flanges **15** and **16** defining between them a groove for reception of a pane of glass and a U-shaped sealing strip or packing **17** embracing the edge of the glass. From the base of the channel defined by the two flanges **15** and **16** there extends a groove **18**. The groove **18** is substantially narrower than the glass-receiving channel and its outer wall is desirably flush with the inner face of the outer flange **15**. The outer face of the stock is provided with a longitudinal groove which receives a sealing strip **20** of suitable resilient material adapted to bear against the outer face of the window frame in association with which the storm sash is to be used.

The rails constituting the frame are assembled around the glass after having been cut to length with mitered corners, as will be clear from Fig. 4. For the purpose of holding adjacent rails together at each corner of the frame, I prefer to employ a sheet-metal clip **22** bent into an L-shape in cross-section and providing along its edges with inturned flanges **23** adapted to be received in grooves extending transversely across the outer faces of the rails near their ends. Such grooves and the flanges they receive have a slightly oblique disposition (Fig. 5), so that each leg of the metal clip **22** will be slightly broader at one end than at the other. In assembling, the two rails are brought together and a clip **22** is positioned as indicated in dotted lines in Fig. 5 with the flanges **23** at the broader end of the clip inserted into the grooves in the rails. Because of the obliquity of the clip-flanges and grooves, the operation of forcing the clip to the final, full-line position indicated in Fig. 5 will draw the mitered end faces of the rails firmly together. As will be clear from Fig. 4, the flanges **23** are desirably not perpendicular to the clip-legs with which they are respectively associated but instead are disposed at acute angles to such clip-legs, and the grooves in the rails are similarly inclined. This inclination of the flanges and the grooves which receive them prevents the clip from spreading and the flanges from leaving the grooves.

Hangers **25** for supporting the sash from the conventional hooks **25'** on the window frame may take the form of generally U-shaped stampings the parallel legs of which extend through slots **26** punched in the upper rail **10** in the plane of the groove **18** therein. As shown, the hangers are adapted for insertion into the top rail **10** from above and carry the weight of the storm sash through ears **27** and **28** projecting outwardly from the lower ends of their parallel legs. The slots **26** have lengths substantially greater than the width of the paral-

lel legs of the hanger. One of the ears, shown as the ear **27**, lies wholly within the groove **18** when the hanger is in place; but the other ear **28** has an upward extension **29** which is adapted to lie in the associated slot **26**, and which, when so disposed, prevents any movement of the hanger longitudinally of the upper rail **10**. The hangers are applied to the upper rail **10** before such rail is positioned on the glass, the ear **28** being first inserted through the one slot **26** and into the groove **18** with the hanger in an inclined position, as indicated in dotted lines in Fig. 4, following which the hanger is swung to bring the other ear through its slot **26**. Upon subsequent movement of the hanger into the full-line position shown in Fig. 4 the ear-extension **29** enters its associated slot **26** to locate the hanger longitudinally of the upper rail. After such rail has been applied to the glass, the latter prevents the extension **29** from dropping out of its associated slot.

The particular storm sash shown in the drawing has upper and lower panes of glass **30** and **31** separated by a mutin **32**. Such muntin, as will be clear from Fig. 7, is conveniently of H-shape in cross-section and may be formed as extruded metal. Its ends abut the inner edges of the side rails **12** and are secured thereto by sheet-metal clips **33** having along their edges flanges **34** (Fig. 6). One of such flanges may be received in the rail-groove which also receives the sealing strip **20**, while the other flange is received in a transverse groove in the muntin. Desirably, the latter flange and the groove which receives it have an oblique disposition, as will appear from Fig. 2. Further, the flanges **34** are disposed at an acute angle to the body of the clip **33**, as shown in Fig. 6. When a clip **33**, disposed below (Fig. 2) with its one flange in the rail-groove and its other flange entering the muntin-groove, is forced upwardly to its final position, the muntin will be drawn and held firmly against the side rail.

In the window shown in the drawings, the lower pane **31** does not extend to the lower rail **11** of the sash but instead is received at its lower edge in a lower glazing rail **36** spaced upwardly from the lower sash-rail **11** to provide for the reception of inner and outer ventilator plates **40** and **41**. The lower glazing rail **36** may be of the same cross-section as is the muntin **32**. The outer ventilating plate **41** extends completely across the lower portion of the sash-frame, its ends being received between the flanges **15** and **16** of the side rails **12**. Such outer ventilator plate is conveniently formed of sheet-metal cut along its upper edge to provide end tongues **43** and a center tongue **44** and along its lower edge to provide end tongues **45** and a center tongue **46**. The metal across the ends of the plate and between the tongues is bent to extend perpendicularly to the plate and form a flange **47** which, except for the interruptions resulting from the presence of the tongues, is continuous throughout the periphery of the plate. The width of the flange **47** (see Figs. 7–10) is such as to enable it to fill the channels in the side rails **12**, bottom rail **11**, and lower glazing rail **36**. The tongues **45** and **46** lie in the groove **18** of the lower glazing strip, while the tongues **43** and **44** seat against the web of the lower glazing strip, as will be clear from Fig. 7.

The inner ventilating plate **40** is formed of a sheet-metal strip having its edges bent to provide flanges **50** so that it will nest within and be guided for sliding movement relative to the outer plate **41**. As is common, the inner and outer plates are provided with openings **51** which are moved into and out of alignment with each other as the inner plate slides. To limit movement of the inner plate between positions in which the ventilating openings are fully open and fully closed, a portion **52** of the upper flange **50** thereon may be offset upwardly to provide a tongue located in the gap in the flange **47** at the upper, center tongue **44** of the outer ventilating plate.

To stiffen the construction at the bottom of the sash, the outer ventilating plate is desirably connected to the lower rail **11**. For this purpose, an upper corner of the tongue **46** may be cut away, as indicated at **53** in Fig. 10 to receive a boss **54** formed by inward displacement of a portion of the flange **15** of such lower rail.



The particular window shown in Fig. 7 has a frame **60** which includes at its outer face a flange **61** forming the outer wall of a guideway for the upper window sash **62**. Such flange **61**, which extends along the side members of the window frame to the bottom of the opening therein, provides a convenient means by which the storm sash can be secured in place through appropriate locking means embodied in the storm sash. The locking means shown in the drawing comprises a pair of locking plates **65** which are conveniently similar and are mounted for horizontal sliding movement between the bottom rail **11** of the storm sash and the lower glazing rail **36**. The body of each locking plate **65** is received within the channels of the lower rail **11** and lower glazing strip **36**, and the vertical edge portions of the locking plate are offset inwardly of the window, the material of the plate at each offset being notched to clear the flanges of the lower rail **11** and lower glazing strip **36**. Each offset portion of the locking plate forms a locking finger **68** adapted to lie against the inner face of the frame-flange **61**. Each locking plate is slidable between a locking position shown in full lines in Figs. 8 and 9 and a retracted position shown in dotted lines in those figures. In the latter position, the locking plates clear the edges of the frame-flanges **61** to permit installation or removal of the storm sash, but in locking position the fingers **68** lie against the inner face of the frame-flange **61** and hold the sash firmly in engagement with the window frame. Sliding movement of each locking plate may be limited by providing it at its lower edge with a tongue **69** which extends into a gap in the flange **47** at the end tongue **45**.

I claim as my invention:

1. In a sash, a pane of glass, a rectangular border frame comprising rails extending along and supporting adjacent edges of said pane and meeting at a corner of the frame, said meeting rails having mitered ends and being provided in their outer faces with transverse grooves, an L-shaped clip having legs extending along said outer rail-faces, and provided with in-turned flanges received in said grooves, said flanges and the grooves receiving them extending obliquely across the outer faces of the respectively associated rails, each of said flanges and the groove-wall it engages being inclined at an acute angle to the associated clip-leg.

2. In a sash, a generally rectangular frame including rails extending along the edges of the sash and a muntin extending between opposite ones of said rails and dividing the frame into two rectangular portions, a pane of glass in each of such frame-portions, a clip for securing each end of said muntin to the adjacent rail, said clip and rail having interengaging provisions guiding the clip for movement along the rail transverse to the muntin, said muntin having in one face a transverse groove oblique to such path, and said clip having an oblique flange received in said groove.

3. A sash as set forth in claim 2 with the addition that said sash is a storm sash, said rail being provided with a longitudinal groove, said clip having a second flange engaging one wall of said longitudinal groove and constituting with such engaged groove-wall said clip-guiding provisions, and a compressible sealing strip disposed in said longitudinal groove for sealing engagement with an associated window frame.

4. A sash as set forth in claim 2 with the addition that said flange and the flange-engaged wall of said groove are disposed at an acute angle to the grooved face of said muntin.

5. In a storm sash having a pane of glass and a pane supporting frame comprising rails, including a top rail, extending along the edges of said pane, each of said

rails having spaced longitudinal flanges defining a channel in which the adjacent pane-edge is received, said top rail having a longitudinal groove opening into the base of said channel, one or more sash-supporting hangers, said top rail being provided with openings permitting said hangers to extend into said groove from above, and ears on said hangers engaging the base of the groove to limit upward movement of the hangers relative to the sash and thereby permit the hangers to support the weight of the sash, said pane being disposed beneath said hangers to limit their downward movement relative to the sash.

6. A sash as set forth in claim 5 with the addition that each of said hangers has two spaced vertical legs, the hanger-legs extending through said openings and having said ears at their lower ends, one of said ears having an upward extension beyond which the remainder of the ear projects horizontally along said groove, said openings having extents such as to permit the ears to be passed into the groove from above and the hanger to move longitudinally of the top rail when said ear-extension lies in said groove but to restrict such longitudinal hanger movement when the extension occupies its associated opening.

7. In a storm sash, a rectangular border frame having side and bottom rails, a lower glazing rail extending between said side rails and spaced upwardly from said bottom rail, said glazing rail having upwardly and downwardly opening longitudinal grooves, said bottom rail having an upwardly opening longitudinal groove, a pane of glass disposed between said side rails and having its lower edge received in the upwardly opening groove of said glazing rail, an outer ventilating plate extending between said side rails and having along its upper and lower edges inwardly projecting flanges received in the opposed channels of the glazing rail and lower rail, and an inner



ventilating plate slidably received between the flanges of said outer ventilating plate, said ventilating plates having openings which can be brought alternatively into or out of alignment with each other in the sliding movement of the inner plate.

8. A sash as set forth in claim 7 with the addition that one of said outer-plate flanges is provided with an opening, said inner plate having a projection extending into said opening to limit sliding movement of the inner plate.

9. In a storm sash, a rectangular border frame having side and bottom rails, a lower glazing rail extending between said side rails and spaced upwardly from said bottom rail, said glazing rail having upwardly and downwardly opening longitudinal grooves, said bottom rail having an upwardly opening longitudinal groove, a pane of glass disposed between said side rails and having its lower edge received in the upwardly opening groove of said glazing rail, and a locking member for holding the sash in position on a window frame, said locking member having upper and lower edge portions slidably received in the opposed grooves of said glazing rail and bottom rail and a locking portion offset inwardly to overlie a side rail of the frame.

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