Aug. 29, 1944. S. C. KIRKPATRICK 2,357,119

STORM SASH AND WINDOW SCREEN STRUCTURE

Filed May 19, 1943

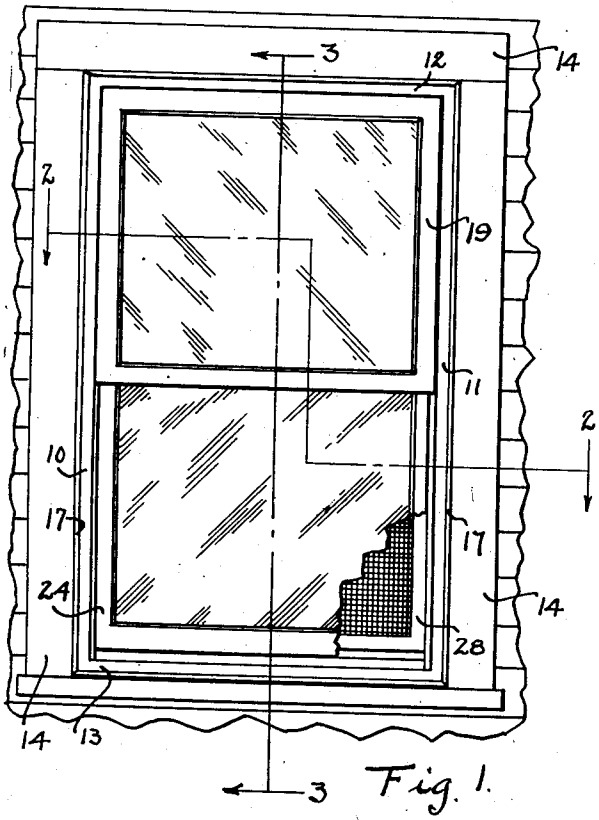


Fig. 1.

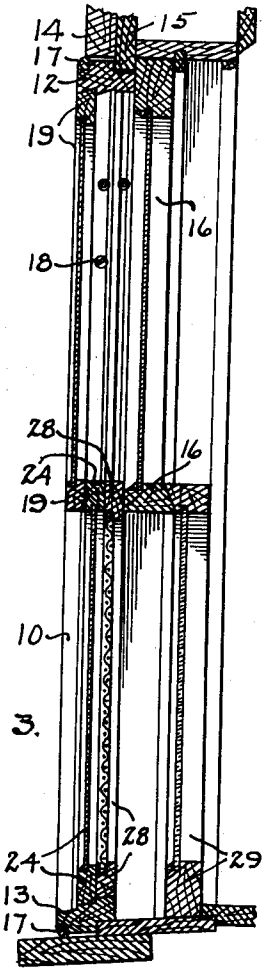
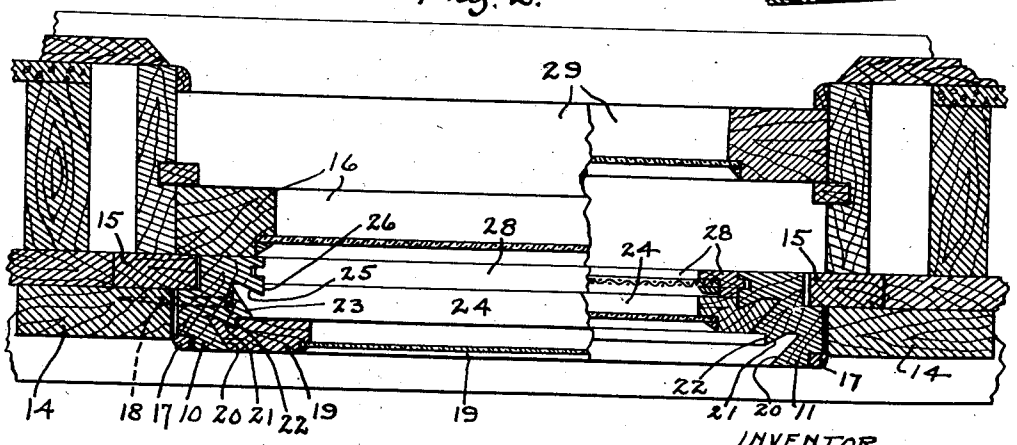


Fig. 3.

Fig. 2.



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Patented Aug. 29, 1944

2,357,119

UNITED STATES PATENT OFFICE

2,357,119

STORM SASH AND WINDOW SCREEN STRUCTURE

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Application May 19, 1943, Serial No. 487,592

7 Claims. (Cl. 160—101)

This invention relates to a storm sash and window screen construction of that type which is designed to be left in the window frame throughout the entire year. The structure embodying the invention may be made in a plurality of individual sizes in accordance with the sizes of window frames to which the invention is to be applied. An important advantage of the invention is that the storm sash may be in two sections, each shiftable vertically, and a single sash size screen may be used in conjunction therewith, all in one unitary frame which is formed to fit within a window frame from the outside thereof substantially flush with the outer face of the outer frame casing.

A further important advantage of the invention is that the structure embodying the invention may be left installed in the window frame as a more or less permanent fixture, the only reason for its removal being to permit painting of the window frame. A still further important advantage of the invention is that ventilation may be had through the structure and further, that the sight through the window sash is not reduced to any appreciable amount. Moreover, the structure is of great utility in summer time to serve as insulation against summer heat during the day, permitting opening at evening for cool air circulation.

A still further important advantage of the invention is that although the storm sash is made in two sections, each shiftable vertically in relation to the other, the sashes are substantially self-sealing against the entrance of wind by reason of the unique tracks provided for the vertical edges of the sashes which provide a mounting that permits the carrying of the two individual storm sashes and the screen, all in the single frame within the extremely limited space found between the outer face of the uppermost window sash and the outer face of the outer casing of the window frame.

These and many other objects and advantages will become apparent to those versed in the art in the following description of one particular form of the invention as illustrated in the accompanying drawing, in which

Fig. 1 is a view in outside elevation of a window frame to which the invention has been applied;

Fig. 2, a view on an enlarged scale in horizontal section on the line 2—2 in Fig. 1; and

Fig. 3, a view in vertical section on the line 3—3 in Fig. 1.

Like characters of reference indicate like parts throughout the several views in the drawing.

A frame is formed to have the two side rails 10 and 11 and the top and bottom rails 12 and 13 respectively. The outer vertical edges of the rails 10, 11, 12 and 13 are rabbeted to permit them to fit within the frame casing 14 against the protruding edges of the blind stops 15 and around across their opposing edges to have the inner faces of the rails terminate in a plane substantially coinciding with the plane of the outer face of the top window sash 16. In other words the storm sash frame has its vertical rails 10 and 11 bearing against the front faces of the exposed parts of the blind stops 15 in each instance. Preferably lateral clearance is left between the vertical edges of the rails 10 and 11 and the opposing edges of the blind stops 15 and of the outer casing 14 so that the storm sash frame may be readily inserted between the opposing edges of the frame casing and the blind stops. In practice it is found that these edges particularly are not always parallel and, therefore, the clearance is provided accordingly. To seal the storm sash frame, a molding 17 is carried around the outer corners of the storm sash frame and is nailed or otherwise secured into position after pushing the molding over against the edges of the window frame casing 14. The storm sash frame is secured in position by any suitable manner, such as by use of a wood screw 18 passing through the rails of the storm sash frame and into the window frame casing 14.

Each of the vertical rails 10 and 11 have peculiarly shaped grooves in their inner opposing portions to form the guides and retaining means for the storm sashes. For the outermost and normally the upper storm sash 19, a corresponding groove is cut vertically in each rail 10 and 11 to have its outer side 20 starting from the face of the rail in each instance and sloping inwardly and toward the outer edge of the rail for a distance back to the plane of the inner side of the sash 19, the outer face of that sash being, in the present instance, flush with the outer faces of the rails 10 and 11. From the inner end of that side 20 of the groove, the groove is carried inwardly toward the center of the sash by a short wall substantially parallel to the outer faces of the rails 10 and 11, and then from the inner end of that flat section, the groove has a wall 21 in each instance sloping outwardly therefrom in a diverging manner from the opposing side 20, this wall 21 terminating by a face 22 on which the rail is cut, inwardly perpendicular in respect to the outer face of the rail to the plane of the inner face of the sash 19. Then from the inner limit

of this face 22, there extends a narrow face parallel to and in substantial coincidence with the plane of the inner face of the sash 19. From the inner terminal end of this narrow face, the rail in each instance is cut along a diagonal line to form a face 23 of a second groove, this face 23 being substantially parallel to the face 20; the face 22 and said narrow face define a rabbet between the first and second grooves. This face 23 continues inwardly to the plane of the inner face of the second sash 24, normally the lower sash. From the inner end of the face 23, the groove is formed to have a wall parallel and in that plane of the sash 24, the lateral length of this parallel wall being limited to some such dimension as a quarter inch or less. From the inner end of this parallel wall, the groove is completed by the opposing face 25 sloping outwardly therefrom toward the forward face of the sash 24 and in a diverging manner from the opposing face 23. The outer terminal edge of this wall 25 of the groove for the sash 24 terminates at a vertical face 26 which is perpendicular to the faces of the sashes 19 and 24, and which continues back to the rear faces of the respective rails in each instance.

The sashes 19 and 24 have their vertical edges formed to engage within their respective grooves, the sashes being entered therein before either the top or bottom rails 12 and 13 are assembled and secured to the side rails 10 and 11. The two sashes 19 and 24 have their vertical edges beveled to slope rearwardly and outwardly from their respective front faces to correspond with the slopes of the groove walls 20 and 23 in each instance. Also the rear faces of these sashes adjacent their outer vertical edges are rabbeted to have vertical grooves formed adjacent those edges corresponding to the slopes of the faces 21 and 25 of their receiving grooves. The sashes are fitted within these grooves to permit them to be shifted readily therealong without undue friction.

Space is provided back of the sash 24 and the inner faces of the rails of the frame to receive the window screen frame 28. Since it is unnecessary to provide a weather seal around the screen frame 28 and the storm sash frame, the vertical rails 10 and 11 are simply provided with vertical grooves into which tongues on the vertical edges of the frame 28 are slidingly received. Each of the sashes 19 and 24 carry panes of glass in the usual manner while the frame 28 is provided with the usual screen thereacross. The various storm sash frame members and the window sash and screen frame may be made out of any suitable material, such as metal or wood, wood being shown in the present form of the invention, particularly emphasizing that even though wood is employed, the two storm sashes, slidable one past the other, and the screen frame 28 may be mounted within the extremely limited space.

By reason of the shape of the grooves in the vertical rails 10 and 11 receiving the sashes 19 and 24, it is to be noted that any wind pressure from the outside tends to force those two sashes inwardly to seat their edge portions against the faces 21 and 25 of the grooves. Also no separate parting strips or the like are required between sashes or on their outer faces in order to retain them within the mounting frame. The sashes 19 and 24 are thus carried in a manner which permits one to pass the other, the inner face of the sash 19 being substantially in the plane of the outer face of the sash 24, clearance only being provided to permit travel of one along the other. In the same manner, the rear face of the sash 24 is substantially within the plane of the outer face of the screen 28 to permit travel of one past the other.

By dividing this storm sash into the upper and lower sashes 19 and 24, a variety of ventilating conditions may be had. Referring to Fig. 3, the screen sash 28 may be pushed to its uppermost position, access thereto being had by raising the lower window sash 29. The lower storm sash 24 may be pushed upwardly to its uppermost position and left there if desired and the screen sash 28 pulled back downwardly to completely screen the opening left thereby. For another condition, the upper window sash 30 may be lowered; the top storm sash 19 lowered; and the screen sash 28 pushed to the top and left there for ventilation through the upper portion of the window frame. A still further variation may be had by pushing the storm sash 19 partially back up so as to have it in some position intermediate the top and lower positions while the screen frame 28 is in the top position so that the ventilation may be limited over the top edge of the sash 19 while some circulation may be had around the under side of the sash 19 and up and back through the screen.

It is therefore to be seen that the invention provides for an extremely simple structure with relatively few parts permitting a substantial frame construction that does not in any way mar the appearance of the building. The invention overcomes the heretofore necessity of having to remove storm sashes for summer storage and screens for winter storage. Both storm sashes and the screen are permanently embodied in a single frame which to all intents and purposes, while removable, may be left for a number of years mounted in the window frame.

The two storm sashes 19, 24, and the screen frame 28 may be retained in any desired position along the side rails by any suitable means, such as the customary friction engaging means, not herein shown and not forming per se a part of the invention.

While I have herein shown and described my invention in the one particular form, it is obvious that structural variations may be employed without departing from the spirit of the invention and I therefore do not desire to be limited to that precise form beyond the limitations as may be imposed by the following claims.

I claim:

1. The combination with a pair of storm sashes and a window screen sash, of a frame having a pair of side rails; each rail having a longitudinal groove along its inner side portion between its front and rear faces; said groove having a front wall sloping inwardly obliquely from said side portion at an acute angle with said front face, and a rear wall sloping outwardly at an acute and diverging angle with said front wall; each rail also having a second longitudinal groove entering said inner side portion back of the first groove with side walls disposed similarly to those of said first groove, each of said sashes having beveled outer edges slidingly fitted within said first and second grooves respectively of both of said rails, said first and second grooves being spaced in each rail to position the opposing faces of the sashes in substantially the same plane but allowing individual travel of the sashes along the rails, and tongue and groove means

slidingly interengaging said rails and said screen sash and carrying the screen sash to have its front face back of both of said storm sashes substantially in the same plane as that of the rear face of the rear storm sash, said screen sash being of substantially the same height as that of said rear sash, and said storm sashes being of substantially equal height to overlap one another transversely centrally between the ends of said side rails when in closed positions.

2. The combination with a pair of storm sashes and a window screen sash, of a frame having a pair of side rails; each rail having a longitudinal groove along its inner side portion between its front and rear faces; said groove having a front wall sloping inwardly obliquely from said side portion at an acute angle with said front face, and a rear wall sloping outwardly at an acute and diverging angle with said front wall; each rail also having a second longitudinal groove entering said inner side portion back of the first groove with side walls disposed similarly to those of said first groove, each of said sashes having beveled outer edges slidingly fitted within said first and second grooves respectively of both of said rails, said first and second grooves being spaced in each rail to position the opposing faces of the sashes in substantially the same plane but allowing individual travel of the sashes along the rails, and tongue and groove means slidingly interengaging said rails and said screen sash and carrying the screen sash to have its front face back of both of said storm sashes substantially in the same plane as that of the rear face of the rear storm sash, said screen sash being of substantially the same height as that of said rear sash, and said storm sashes being of substantially equal height to overlap one another transversely centrally between the ends of said side rails when in closed positions; each of said side rails having a longitudinal rabbet between said first and second grooves forming a face extending from the outer edge of the rear wall of the first groove perpendicularly to the faces of said sashes rearwardly to substantially the plane of the opposing faces of said storm sashes, and a face extending substantially in said last plane from said perpendicular face to the outer edge of the forward wall of said second groove; and said front storm sash having a rabbet on its rear face one adjacent each of its outer longitudinal edges, said rabbets being shaped to receive slidingly therein the portions of the side rails between the rear walls of said first grooves and said perpendicular faces.

3. The combination with a pair of storm sashes and a window screen sash, of a frame having a pair of side rails; each rail having a longitudinal groove along its inner side portion between its front and rear faces; said groove having a front wall sloping inwardly obliquely from said side portion at an acute angle with said front face, and a rear wall sloping outwardly at an acute and diverging angle with said front wall; each rail also having a second longitudinal groove entering said inner side portion back of the first groove with side walls disposed similarly to those of said first groove, each of said sashes having beveled outer edges slidingly fitted within said first and second grooves respectively of both of said rails, said first and second grooves being spaced in each rail to position the opposing faces of the sashes in substantially the same plane but allowing individual travel of the sashes along the rails, and tongue and groove means slidingly interengaging said rails and said screen sash and carrying the screen sash to have its front face back of both of said storm sashes substantially in the same plane as that of the rear face of the rear storm sash, said screen sash being of substantially the same height as that of said rear sash, and said storm sashes being of substantially equal height to overlap one another transversely centrally between the ends of said side rails when in closed positions; each of said side rails having a longitudinal rabbet between said first and second grooves forming a face extending from the outer edge of the rear wall of the first groove perpendicularly to the faces of said sashes rearwardly to substantially the plane of the opposing faces of said storm sashes, and a face extending substantially in said last plane from said perpendicular face to the outer edge of the forward wall of said second groove; and said front storm sash having a rabbet on its rear face one adjacent each of its outer longitudinal edges, said rabbets being shaped to receive slidingly therein the portions of the side rails between the rear walls of said first grooves and said perpendicular face; and each rail having an inner face extending rearwardly from the outer edge of the rear wall of the second groove substantially perpendicularly to said planes.

4. The combination with a pair of storm sashes and a window screen sash, of a frame having a pair of side rails; each rail having a longitudinal groove along its inner side portion between its front and rear faces; said groove having a front wall sloping inwardly obliquely from said side portion at an acute angle with said front face, and a rear wall sloping outwardly at an acute and diverging angle with said front wall; each rail also having a second longitudinal groove entering said inner side portion back of the first groove with side walls disposed similarly to those of said first groove, each of said sashes having beveled outer edges slidingly fitted within said first and second grooves respectively of both of said rails, said first and second grooves being spaced in each rail to position the opposing faces of the sashes in substantially the same plane but allowing individual travel of the sashes along the rails, and tongue and groove means slidingly interengaging said rails and said screen sash and carrying the screen sash to have its front face back of both of said storm sashes substantially in the same plane as that of the rear face of the rear storm sash, said screen sash being of substantially the same height as that of said rear sash, and said storm sashes being of substantially equal height to overlap one another transversely centrally between the ends of said side rails when in closed positions; each of said side rails having a longitudinal rabbet between said first and second grooves forming a face extending from the outer edge of the rear wall of the first groove perpendicularly to the faces of said sashes rearwardly to substantially the plane of the opposing faces of said storm sashes, and a face extending substantially in said last plane from said perpendicular face to the outer edge of the forward wall of said second groove; and said front storm sash having a rabbet on its rear face one adjacent each of its outer longitudinal edges, said rabbets being shaped to receive slidingly therein the portions of the side rails between the rear walls of said first grooves and said perpendicular face; and each rail having an inner face

extending rearwardly from the outer edge of the rear wall of the second groove substantially perpendicularly to said planes; said screen sash being slidingly positioned between said last inner faces.

5. For a window frame having an outer casing therearound, an outer upper and an inner lower sash, and a blind stop extending from the inner edges of said casing overlapping the outer sash, the combination of a storm sash and window screen frame formed of side rails and top and bottom rails to fit within the inner edges of said casing and said stop; a screen sash slidingly carried by said side rails to have the plane of its inner face substantially within the plane of the outer face of said outer window sash; an inner storm sash slidingly carried by said side rails to have its inner face substantially in the same plane as that of the outer face of said screen sash; and an outer storm sash slidingly carried by said side rails to have its inner face in substantially the same plane as that of the outer face of said inner storm sash; and angularly disposed means interengaging said side rails and said storm sashes maintaining said sliding supports therebetween.

6. For a window frame having an outer casing therearound, an outer upper and an inner lower sash, and a blind stop extending from the inner edges of said casing overlapping the outer sash, the combination of a storm sash and window screen frame formed of side rails and top and bottom rails to fit within the inner edges of said casing and said stop; a screen sash slidingly carried by said side rails to have the plane of its inner face substantially within the plane of the outer face of said outer window sash; an inner storm sash slidingly carried by said side rails to have its inner face substantially in the same plane as that of the outer face of said screen sash; and an outer storm sash slidingly carried by said side rails to have its inner face in substantially the same plane as that of the outer face of said inner storm sash; said storm sashes having longitudinal edges sloped inwardly and outwardly from front to back faces and having reentering grooves on their rear faces adjacent those edges, and said side rails having grooves whose side walls slidingly fit about said sloped edges and within said reentering grooves.

7. For a window frame having an outer casing therearound, an outer upper and an inner lower sash, and a blind stop extending from the inner edges of said casing overlapping the outer sash, the combination of a storm sash and window screen frame formed of side rails and top and bottom rails to fit within the inner edges of said casing and said stop; a screen sash slidingly carried by said side rails to have the plane of its inner face substantially within the plane of the outer face of said outer window sash; an inner storm sash slidingly carried by said side rails to have its inner face substantially in the same plane as that of the outer face of said screen sash; and an outer storm sash slidingly carried by said side rails to have its inner face in substantially the same plane as that of the outer face of said inner storm sash; said storm sash frame being rabbeted around said rails to seat against the outer face of said stop and to have the inner faces of said rails substantially in sliding contact with said upper window sash.

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