

Oct. 2, 1951

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2,569,942

COMBINATION STORM AND SCREEN UNIT

Filed April 20, 1946

2 Sheets-Sheet 1

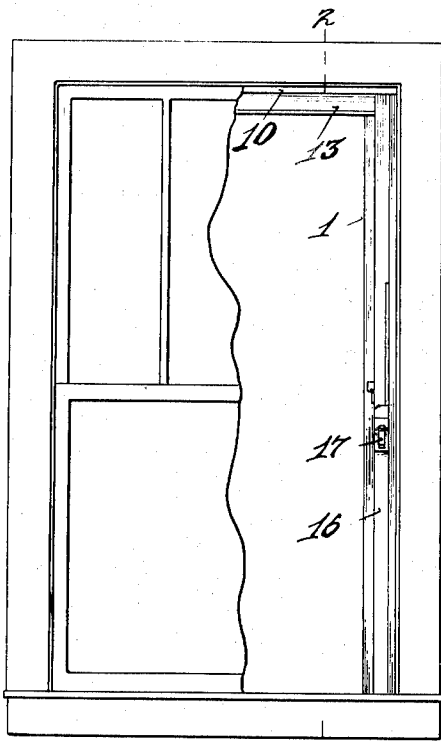


Fig. 1.

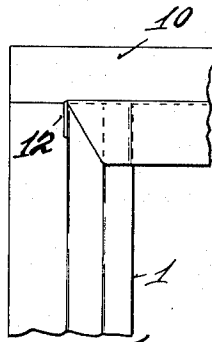


Fig. 3.

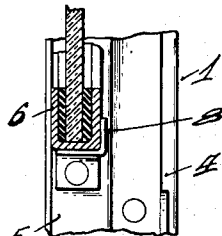


Fig. 4.

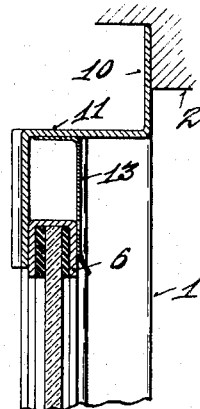


Fig. 2.

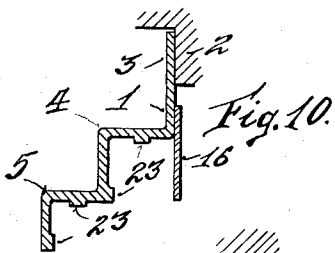


Fig. 10.

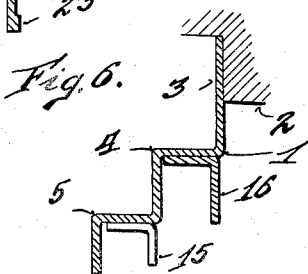


Fig. 6.

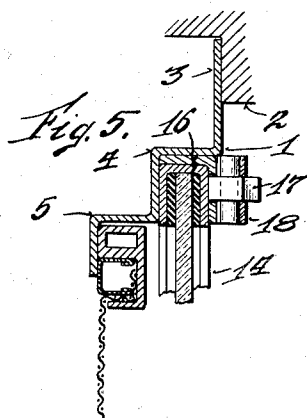
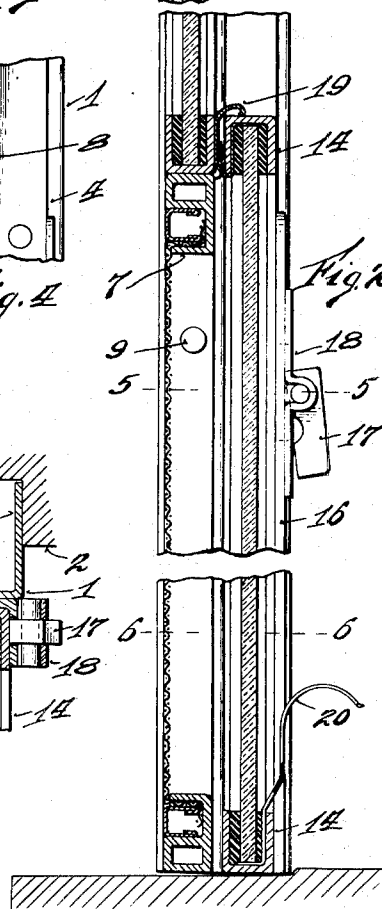


Fig. 5.



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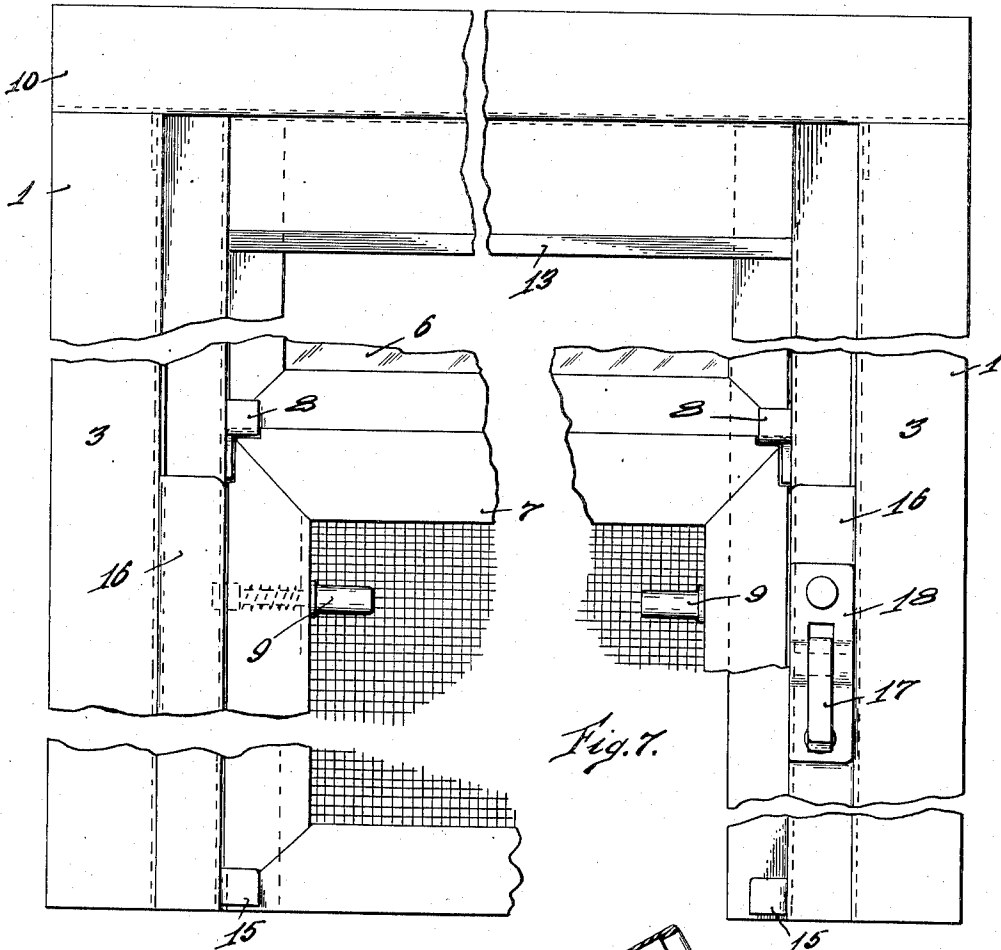


Fig. 7.

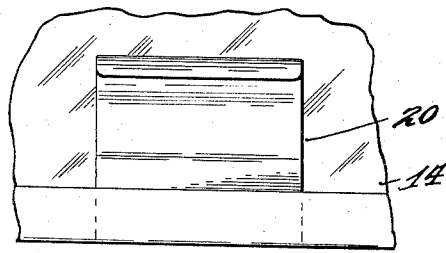


Fig. 8.

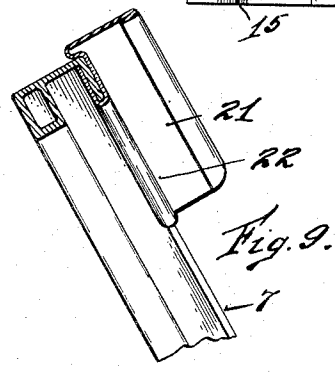


Fig. 9.

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## UNITED STATES PATENT OFFICE

2,569,942

## COMBINATION STORM AND SCREEN UNIT

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Application April 20, 1946, Serial No. 663,721

7 Claims. (Cl. 160-90)

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This invention relates to improvements in combination storm and screen panel units, applicable upon installed window or the like opening frames for auxiliary insulation protection and alternately to guard against the admission of insects, with the panels readily removable from the inside of the room, for seasonal interchange or free access to the exterior side of the sash of the window frame for cleansing and other service. Reference is made to related copending application for United States Patent Serial No. 722,678 filed January 17, 1947.

The combination auxiliary storm and screen panel units, to which the invention is directed, each provides a pair of side rails of corresponding cross-sectional form and a head or cross rail readily applicable to an installed window frame for removably mounting and sustaining auxiliary panels, as an upper glazed and a lower screen in vertical alignment, and a lower glazed panel in offset relation to the aligned panels. The lower panel is slidably elevatable for adjustably setting the same for various degrees of ventilation opening. The cross-sectional form of the side rails are of a character to give stability thereto and to seat panels of relatively different width measurement in adjoining relation to facilitate their removal inwardly of the room and in freedom from the side rails or jambs of the window frame to which the rails of the unit are applied.

An object of the invention is to provide a combination storm and screen panel unit with a frame work of companion side rails and a head cross rail for separate fitting and application and adaptation for the required width dimension of the auxiliary panels and degree that the window frame may be out of plumb. A head rail that possesses an excessive tolerance to accommodate for appropriate relative panel setting for their height without necessitating making any fitting alteration in their height dimension. Therefore the panels, with light metal frames, can be factory prefabricated in determined sizes ready for service and without any fitting or production work at the place of installation which is time consuming and costly.

Another object is to provide a combination storm window screen readily applicable to an installed window frame, as auxiliary to the regular sash therein, and in which the lower glazed panel can be elevated for various degrees of ventilation opening.

Another object is to provide for a quick seasonal interchange of the panels from either glazed to screen, all individually inserted or removed inwardly of the room.

Another object is to provide storm and screen panels having frames constructed from conventional metal bar material of corresponding depth measurement for compactness in depth dimension

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for installation within the confines of an installed window frame, and interchange within the sustaining side rails, employed for mounting the panels within an installed window frame.

5. Various other features and advantages of the invention will be more fully set forth in the following description of the accompanying drawings forming a part hereof, and depicting a preferred embodiment, in which:

10. Figure 1 is an interior elevation of a conventional window frame equipped with the improved unit, applied to the outer side of the window frame, with the sash and screen panel thereof removed.

15. Figure 2 is an enlarged section on line 2-2, Figure 1, and including the sash and screen panels.

Figure 3 is an elevation of a corner section of the frame for the auxiliary sash and screen panels.

20. Figure 4 is an elevation of a section of one of the rails or jambs of the frame illustrating the manner of sustaining and confining the lower end of the upper auxiliary sash therein, the sash being shown in section.

25. Figure 5 is a section on line 5-5, Figure 2.

Figure 6 is a section on line 6-6, Figure 2, with the sash and screen panel removed.

30. Figure 7 is an elevation of the unit viewed from the interior side in its application upon a window frame, with the lower sash removed.

Figure 8 is a plan view of a hand hold or lift, as applied to the inner side of the bottom rail of the frame of the lower sash.

35. Figure 9 is a sectional perspective view of a portion of a side rail of the frame of a screen panel and hand hold or grip therefore.

Figure 10 is a section similar to Figure 6, illustrating a modified form of side rails.

The seasonal substitution or replacement of storm sash and screen panels particularly when each is of a dimension respectively embodying the entire area of the window opening for the sizes conventionally employed for residence buildings requiring the alternate storage of one while the other is in use has always been of considerable burden to the user in making the exchange. A single sash or screen panel for the full opening area of the average size of a residence building window, is difficult to install and remove from the inside of the building. In the present instance, the auxiliary sash and screen panels, respectively, in size are comparative each to the double-hung sliding sash employed in the window frame and preferably of slightly less width dimension there-to so that they can readily and conveniently be installed or removed from the inner side of the window without interference therewith.

Referring to the drawings, 1 indicates one of a pair of sheet metal side rails or jambs of corresponding cross-sectional configuration, each

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adapted to be secured to a relative jamb of a window frame, as upon the outer side of the outer blind stop 2 thereof. As illustrated in Figures 5 and 6, each side rail or jamb is of stepped form in cross-section to provide a pair of guide ways, relatively off-set from one another in two directions. Each rail embodies a flange 3, as a base therefor longitudinally of and for the full length of the rail for overlapping the outer surface or edge of the outer blind stop 2 of the window frame for application thereon. The flange may be provided with suitably spaced apertures or notches opening to the outer edge, each for the reception of a screw or other type of fastening means for attaching the rails to the blind stop. The flange is of appropriate width to accommodate for an absolute perpendicular setting of the rail irrespective of any degree that the jamb of the window frame may be out of plumb and to sustain the auxiliary sash inward from the jambs of the window frame. From the flange, the rail is bent laterally from one side thereof to provide a pair of right angular relatively stepped portions or steps 4 and 5, for the full length of the rail and which extend outward when the rail is installed upon the window frame. The cross-sectional configuration of the side rails therefore provide a pair of off-set ways or steps, for sustaining relatively differential widths of sash and screen panels, with the innermost way or step for the greater width of sash within the minimum width dimension of the window frame to allow ample clearance for a direct inner removal of the auxiliary sash and screen panels without being required to cant the same for passage through the window frame. This also provides ample marginal space for panel clamping or locking devices with which the side rails or parts may be equipped. The stepped form of side rails materially stiffens and reinforces the rail structure so that they can be constructed of comparatively thin gauge metal, as well as simplifying its production.

The outer step 5, of the side rails, serves for sustaining an upper sash 6, and a lower screen panel 7, in relative alignment. Each is independently locked or confined to the rails so that they can be separately removed without disturbance one to the other. The screen panel can therefore be removed and omitted during the winter season, if desired, and alternately a screen panel can be interchanged with the upper sash 6, during the summer season, if it is desired to screen the full opening area of the window.

The upper auxiliary sash or panel 6, at its opposite lower corners respectively, is seated and laterally confined by a stationary latch 8, fixed to a side rail, which requires that the panel be slightly elevated for release therefrom for panel removal. The screen panel is shown for release therefrom for panel removal. The screen panel is shown as locked in place, by a pair of spring bolts 9, each respectively traversing an aperture in a side rail. The forms of latch or locking means disclosed is merely selective it being obvious that various other types may be employed.

The upper end of the side rails 1, join with and are capped by a head rail 10 of Z-bar form in cross section and may be described as comprising a web portion 11, having laterally projecting flange respectively from each of its longitudinal ends, extending in relative opposite directions. One of the flanges serves as a base for securing the rail to the upper outer cross blind stop of the window frame and therefore compan-

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ion to the base flange 3 of each of the side rails and in plane therewith.

The web portion 11 of the cross rail 10, extends in a horizontal plane from the window frame and covers the stepped upper end of side rails and the outer flange depending therefrom overlaps the outer face of the transverse end limb or riser of the step 5, of the side rails 1. The opposite ends of the web portion 11, are bent laterally to provide depending lips or tangs 12, which respectively overlap the upper end of the step 4 of the side rails. The opposite longitudinal ends of the head rail completely covers and sheds the upper ends of the side rails and the construction is such that the rails need not be fastened together, which is of advantage in the application thereof to the window frame. The medial portion of the depending flange of the head rail for its length between the longitudinal ends of the side rails is depressed to bring the same into registry and alignment or plane with the outer head of the step 5, of the side rails for a bearing contact with the upper rail of the frame of the upper sash 6.

A length of flexible metal weather strip 13, of angle form in cross section is fixed to the lower or inner side of the web 11 of the cross rail, to overlap the inner side of the upper end of the sash frame, to laterally confine the same and yieldingly bind the sash against the depending flange of the cross rail 10 and side rails 1.

The head rail with the weather stripping provides a channel for the full width of the upper panel and has a depth to permit the upper panel to be elevated from the latches 8, and above the top of the lower panel 14, whereupon the upper panel can be swung to an angle inwardly of the window frame, the weather stripping yielding sufficiently, so that the panel can be slid or conveyed downwardly for removal.

The sash and screen panel are equipped with means for obtaining a hand hold thereon, a type for each is illustrated respectively in Figures 8 and 9, to facilitate in the manual handling of the panels for insertion and removal, and which will, hereinafter, be described in detail.

As illustrated in Figure 7, the lower end of the screen panel 7, is confined against lateral displacement by a pair of stationary latches 15, 15, each respectively fixed to a relative side rail. Upon releasing the spring bolts 9, from their locking connection with the side rails the panel can be tilted to a degree sufficient to clear the lower end of the upper panel, and thereupon it can be elevated to a degree to release it from the lower latches 15, 15, whence it can be withdrawn inwardly of the window frame for removal.

The lower auxiliary glazed panel 14, is slidably sustained within guideways or channels formed by the step 4, of the side rails and an angle strip 16, respectively fixed to the limb or riser of the inner step of each rail extending perpendicular or at an angle to the flange 3, thereof. The channels thus formed for each of the side rails correspondingly are slightly short of the length of the lower sash to permit the panel to be extracted therefrom in an elevated position.

Guidingly and laterally confining the lower panel within the side rails provides for elevating the same to any partial height within the channel for a ventilation adjustment and it is locked in any ventilating position of adjustment by a clamp lever 17, pivotally mounted or journalled within a supporting plate 18, fixed to the face side of the angle strip 16. The forward or stud

end of clamp lever traverses a longitudinal slot in the supporting plate 18, and angle strip 16, and when the lever is moved to extend in an angular position from the channel, impingingly bears against the side rail of the lower panel frame securely binds the same in its adjusted elevated position.

The upper cross rail of the frame of the lower panel, at its outer side, carries a yielding weather or sealing strip 19, for a bearing contact with the lower rail of the frame of the upper panel 6, when both panels are in their closed position, as illustrated in Figure 2. The sealing or weather strip 19, is produced from a thin gauge sheet metal material, spring tempered, bent to U-form in cross section, with one limb thereof serving for anchoring the strip within the channel of cross rail of the panel frame, formed of a channel bar, the end of the limb having a lateral flange longitudinally thereof to bear against the inner side of the web of the frame bar or base of the channel thereof and overlie the edge of the glass pane glazed within the frame. The weather strip is inserted within the panel frame preliminary to glazing, so that the pane and putty or medium securing the pane within the panel frame anchor the weather strip to the frame without the use of any auxiliary fastening means. This method of application of the weather strip to the frame is simple, efficient, economical and devoid of any air gaps. The yielding limb of the weather strip flares rearwardly over the edge surface of the rail of the panel frame, which serves to reinforce the limb longitudinally to avoid against crimping which would result in the production of air gaps and interfere within a uniform bearing contact with the adjoining surface of the lower rail of the upper panel against which the limb bears in the closed position of both upper and lower panels.

The method of application of the weather strip to the sash or panel frame is analogously followed for the application hook sash lifts or handles 20, to the panel frames as illustrated in Figures 2 and 8, and for a handle 21, to the frame of the screen panel, as shown in Figure 9.

It is more preferable to apply the handles to the side rails of the screen frame, and as the screen fabric and the means for securing the same marginally within a channel in the frame rails, are of a yielding character and to appropriately direct the hand gripping portion of the handle inwardly from the frame, it is of angle form in cross section, with the anchoring flange or limb 22, thereof of U-form in cross section to clasp about a flange of a rail bar of the screen frame. The handle at the corner formed by the angular form of the plate is corrugated to loop about the outer side corner of the rail of the screen frame and in conjunction with the anchoring flange, secures the handle to the rail against lateral displacement and non-disturbing to the screen fabric and beading or binding strip, clinching the screen fabric within the channel of the frame.

The frame forming rails for both sash and screen frames are of conventional form preferably produced from extruded metal bars, as of aluminum or non-corroding metal alloy, of extreme stability and lightness in weight with the bar thickness of both sash and screen frames of the same dimension. This provides for registry of the frames of the upper sash and lower screen and which also permit ready interchange of a screen panel for the upper sash for a seasonal

change. As the depth measurement of each type of panel is approximately three-eighths of an inch, they provide for a minimum depth of side and top cross rails which can be confined within the window frame for architectural design.

The side rails and head or top rail for symmetry, approximate the same width dimension, allowing for an excessive degree of elevation for the upper panel than nominally required for its removal, which is of material advantage in pre-fabrication and application of the unit to an installed window frame, in eliminating undue fitting accuracy in making the application. Ordinarily it is only necessary to trim the upper end of the side rails to accommodate for an appropriate application of the rails within the window frame and which permits the fixtures upon the rails to be pre-applied. This materially reduces the time, labor and cost of installation and permits standardizing the sizes of the sash and screen panels.

In producing the rails 1, by an extruded metal process, the limbs of the steps on their inner side, may each be provided with a rib 23, extending longitudinally thereof, as shown in Figure 10, which materially strengthens the rail and provides for a minimum bearing contact with the rail, reducing friction in the sliding movement of the sash. The rib on the riser portion or limb of the step provides a shoulder for, latching the sash or screen frame to the rail for withholding the same against lateral displacement or removal.

Having described my invention, I claim:

1. A combination storm and screen panel unit for a building opening comprising a frame having spaced parallel side members each double stepped in cross section providing panel tracks of different widths, a plurality of panels assembled in the frame including upper and lower panels of substantially the same width having sides received in the narrow panel tracks and another panel having sides received in the wider panel tracks, bracket means carried by at least one of the side members and in engagement with the bottom of the upper panel to support the latter, said bracket means including an upstanding element engageable with a side face portion of the upper panel confining the latter against the frame and preventing lateral withdrawal of the upper panel from the narrower panel tracks of the frame, and means for retaining said other panel in the wider panel tracks.

2. In a closure structure for a building opening, a frame and a plurality of panels of different widths slidably supported therein, the frame including spaced side members each double stepped in cross section and each presenting substantially throughout the length of the frame at least two surfaces offset from one another and substantially parallel to one another and to the panels to provide individual stops for sliding engagement with side faces of different panels, and also substantially throughout the length of the frame, at least two other surfaces offset from one another and substantially parallel to one another and normal to the panels to provide individual guides for engagement with the edges of the different panels, the said surfaces of each member being arranged as a pair of panel tracks restraining the panels of different widths against edgewise shifting and lateral movement in one direction while permitting lateral movement of the panels in another direction for removal from the frame, the panel tracks of the members including rel-

actively narrowly spaced tracks and relatively widely spaced tracks, said panels including a pair having substantially the same width and normally disposed one above the other in the narrowly spaced tracks, said panels also including a panel received in the widely spaced tracks and disposed flatwise against the lower of said pair of panels, and means associated with a portion only of the length of the frame side members for restraining at least one of the panels against movement in said other direction to hold said one panel in the frame.

3. In a closure structure for a building opening, a frame having spaced substantially parallel side members each double stepped in cross-section providing relatively wide and relatively narrow panel tracks having panel side face and panel edge face contacting and guiding portions, each track extending substantially the full length of the frame, a plurality of panels assembled in the frame including upper and lower panels having sides received in the narrow tracks and a third panel having sides received in the wide tracks, and flange means carried by at least one of the frame side members in association with the wide panel track to engage side face portions of the third panel thereby confining the latter against the frame and preventing lateral withdrawal of the third panel, said flange means being disposed wholly beyond the plane of the edge face guiding portion of the associated narrow track to permit lateral withdrawal from the frame of the lower panel upon raising of the third panel above the level of the lower panel.

4. In a closure structure for a building opening, a frame having spaced substantially parallel side members each double stepped in cross section providing relatively wide and relatively narrow panel tracks having panel side face and panel edge face contacting and guiding portions, a plurality of panels assembled in the frame including upper and lower panels having sides received in the narrow tracks and a third panel having sides received in the wide track, and flange means carried by at least one of the frame side members in association with the wide panel track to engage side face portions of the third panel thereby confining the latter against the frame and preventing lateral withdrawal of the third panel, said flange means being disposed wholly beyond the plane of the edge face guiding portion of the associated narrow track to permit lateral withdrawal from the frame of the lower panel upon raising of the third panel above the level of the lower panel.

5. A combination storm window and screen panel unit for a building opening comprising a frame having spaced parallel side members each stepped in cross section substantially from end to end to provide panel tracks of different widths substantially from top to bottom of the frame, a plurality of panels assembled in the frame including upper and lower panels of substantially the same width, said upper and lower panels each having side edges received in relatively narrow panel tracks, whereby the relative positions of the upper and lower panels can be interchanged in the narrow tracks, and another panel wider than the said upper and lower panels having side edges received in relatively wide panel tracks, whereby the other panel is slidable substantially the full length of the frame while being guided in the wide tracks, and means for interlocking the bottom edge of the upper panel with at least one of the side members to resist lateral with-

drawal of the upper panel from the narrow tracks and also to support the upper panel in an upper portion of the narrow tracks in the absence of the lower panel.

6. A combination storm window and screen panel unit for a building opening comprising a frame having spaced parallel side members each stepped in cross section substantially from end to end to provide panel tracks of different widths substantially from top to bottom of the frame, a plurality of panels assembled in the frame including upper and lower panels of substantially the same width, said upper and lower panels each having side edges received in relatively narrow panel tracks, whereby the relative positions of the upper and lower panels can be interchanged in the narrow tracks, and another panel wider than the said upper and lower panels having side edges received in relatively wide panel tracks, whereby the other panel is slidable substantially the full length of the frame while being guided in the wide tracks, and a bracket on one of the side members for engaging the bottom of the upper panel and supporting the latter, the bracket having one element disposed substantially flatwise against the side member, another element substantially horizontally disposed for underlying the bottom of the panel supported thereby, and a third element substantially vertically disposed for engaging a side face of the supported panel to resist lateral withdrawal of the latter from the narrow tracks.

7. A combination storm window and screen panel unit for a building opening comprising a frame having spaced parallel side members each stepped in cross section substantially from end to end to provide panel tracks of different widths substantially from top to bottom of the frame, a plurality of panels assembled in the frame including upper and lower panels of substantially the same width, said upper and lower panels each having side edges received in relatively narrow panel tracks, whereby the relative positions of the upper and lower panels can be interchanged in the narrow tracks, and another panel wider than the said upper and lower panels having side edges received in relatively wide panel tracks, whereby the other panel is slidable substantially the full length of the frame while being guided in the wide tracks, and a bracket secured to the narrow track of one of the side members and having an element received between the upper and lower panels to support the upper panel.

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