SUPPLEMENTARY SASH AND FRAME FOR WINDOW OPENINGS

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This invention relates to improvements in a combined storm and screen sash unit for a window or the like opening, applicable to an installed conventional window frame.

An object of the invention is to provide a combined storm and screen sash unit with the sash of sliding type readily applicable to an installed window frame, furnishing either insect or storm protection, the latter auxiliary to the regular light sash with which the window frame is ordinarily equipped, and avoiding the necessity of removal or replacement of either of the auxiliary sash of the unit for different seasonal service.

Another object is to provide a sheet metal frame and sash unit, the sash slideably sustained and readily removable from the frame for auxiliary service and readily applicable within an installed conventional window frame.

Various other features and advantages will be more fully set forth in the description of the accompanying drawings, in which:

Figure 1 is an interior elevation of a conventional window frame equipped with the improved storm and insect sash and frame unit installed within the window frame and the upper and lower main sash of sliding type partially broken away to illustrate the installation.

Figure 2 is a view similar to Figure 1 with the upper and lower conventional sash removed from the window and with the lower storm sash latched in an elevated position illustrating the insect screen mounting.

Figure 3 is a sectional view taken on line 3—3, Figure 1, through the upper portion of the window, illustrating the storm sash and side rails of the auxiliary frame.

Figure 4 is a sectional view taken on line 4—4, Figure 1, through the lower sash, illustrating the side by side mounting of the lower storm and screen sash, together with the rail structure of the auxiliary frame.

Figure 5 is an enlarged fragmentary sectional view detailing the side rail of the auxiliary frame for the upper portion of the unit.

Figure 6 is an enlarged fragmentary sectional view similar to Figure 5, detailing the side rail of the auxiliary frame for the storm and screen sash at the lower portion of the unit.

Figure 7 is a longitudinal section taken on line 7—7, Figure 1, illustrating the storm sash in closed position with the screen sash adjoining the lower storm sash.

Figure 8 is a sectional view taken on line 8—8, Figure 1, illustrating the lower storm sash in elevated position corresponding to the position shown in Figure 2.

Figure 9 is a central section through the auxiliary frame and illustrating the insertion and removal of the upper sash, and with the lower storm and screen sash removed.

Figure 10 is an inside elevation of an end portion of the auxiliary frame and of the elements shown in Figure 9.

Figure 11 is a fragmentary front elevation of a portion of the frame similar to Figure 10, showing a portion of the upper sash and screen sash mounted therein.

Figure 12 is an enlarged sectional view detailing the frame structure of the storm sash.

Figure 13 is an enlarged sectional view detailing the frame structure of the insect screen.

Figure 14 is an enlarged fragmentary sectional view similar to Figure 6, illustrating a modified form of side rail structure for the lower portion of the window for retaining the screen and storm sash.

Figure 15 is an elevation of the inner side of portions of a frame in which the rail sections for the auxiliary sash are of modified construction and permanently assembled into a frame, adapting the frame and sash to be merchandised as a unit for ready application and installation within a standard size of window frame.

Figure 16 is a section on line 16—16, Figure 15.

Figure 17 is a section on line 17—17, Figure 15.

Figure 18 is a section on line 18—18, Figure 15.

Figure 19 is a section on line 19—19, Figure 15.

The seasonal substitution or replacement of the storm and screen sash, requiring the alternate storage of one while the other is in use, has always been of considerable annoyance to the user, and the removal of the storm sash during the warm weather period provides no auxiliary protection for the window in an emergency during a heavy rain or windstorm.

It has been the common practice to employ separate storm and screen sash to take in the full measurement of a window frame, necessitating their removal in making a seasonal change from one to the other. A single sash accommodating for the full opening area of a window frame is burdensome to handle and requires to be hinged to adapt the same to be swung outwardly to obtain access to the main sash for cleansing, and it is generally necessary to remove the auxiliary storm sash for cleansing as its outer side usually is not accessible from the window.
The auxiliary sash are slidably sustained in sheet metal rails of suitable length for a given size of window opening, respectively individually secured to the opposite side and top blind stops of a window, or they may be incorporated in conjunction with a bottom sill rail into an integral frame. In the latter instance, the frame and sash as a unit are preferable for manufacture or merchandising for immediate installation within standard or conventional stock sizes and styles of window frames.

Referring to the drawings, there indicates a pair of sheet metal side rails or guides in separate or individual length and respectively removable secured to the jams of the window or sash frame preferably along the outer side of the outer blind stops or head strips as a part of the window frame. The rails, either as separate strips or the sides of a frame, are of duplicate construction, formed of sheet metal, primarily of Z cross section for its entire length providing a pair of oppositely extended flanges and at relative opposite sides and ends of the central web portion. The flange is provided with a plurality of notches or apertures extending laterally inward from its longitudinal edge and at a definite spacing apart, each for the reception of a screw for the purpose securing the rail to a blind stop of the window frame. The rail is adjustable on a blind stop or can be set to accommodate for an appropriate width of sash and to bring the inner side of the web portion of the rail approximately flush with the face side of the outside blind stop, as shown in Figure 5, or slightly thereubro to avoid interference in the insertion or removal of the auxiliary sash.

The flange of the rail, as an outside stop, extends inwardly of the window frame and has its longitudinal margin into trimmed, rounding the edge and reinforcing the flange. The flange for an approximate length of the upper storm or auxiliary sash has its trimmed margin slightly spaced from the portion of the flange which overlies to provide a yielding bearing surface against the frame of the upper auxiliary light or storm sash to effect a weather seal. The trimmed margin for the length of the lower sash is compressed or clinched against the flange which it overlies, as no yielding influence is required for effecting a weather seal, as it provides an outside stop for a screen sash.

The double ply formation of the front flange for the length of the lower sash thereof accommodates for a slightly greater thickness of conventional screen frame over the conventional frame material employed for the light sash, thereby bringing the top and bottom sash or frames flush with each other at the inner side.

The sash sustaining rails for the major portion of the length occupied by the lower sash correspondingly are formed to provide a channel to accommodate and laterally confine a pair of auxiliary sash, as the screen sash and the second lower light sash. The channel formation is produced by various methods, as by folding a section of the main rail upon itself and bending the same at an angle to the web portion to form a double ply inturmed guide flange or inside stop with the outer limb thereof co-extensive, or as a continuation of the anchoring flange of the rail according to one mode of rail manufacture as illustrated in cross-section Figure 6.

A secondary rail section 14 is fitted within and constitutes a part of the main rail for the length of the lower sash and comprises a strip of sheet metal bent to angle form, having its longitudinal free margin of one limb engaged between the compressed doubled-over section of the main rail 3 of the main rail for rigidly connecting the same. The limb 12 of the secondary rail section 14 is of doubled form with the return bend spaced from the body portion of the limb, giving width to the edge 14 which serves as a guide or shoulder longitudinally for the length of the secondary rail within the channel section of the rail and with the flange of the rail forms a groove for the lower light sash. The upper end of the limb also serves to support the upper sash.

In a modified form of secondary rail section, shown in cross-section Figure 14, the rail section mainly is of channel form in cross-section with the web portion offset or stepped longitudinally to provide a longitudinal guide shoulder 15. The inner flange 16 of the secondary rail is double back upon itself to laminate the same, and the outer lamination is co-extensive with and underlies the anchoring flange of the main rail. In the form shown in Figure 17, corresponding in part to that shown in Figure 6, the outer flange 11 represents a separate strip and the inner side of the anchoring flange of the rail.

Each guide rail for the upper section of the window frame or upper auxiliary sash is of non-channel form and thereby is open to one or the inner side for the insertion and removal of all of the sash of the unit, while the lower section is of channel form and laterally confines a pair of sash disposed therein.

The upper sash 3 at each of its opposite lower corners has a nub depending therefrom for intermesh or engagement into a notch formed in the top end of the limb of the secondary rail section 12 to normally latch the lower end of the upper sash against a lateral displacement, as shown in Figures 9 and 10. The upper end of the upper sash 3 is engaged within the channel of a channel cross rail fixed to the head of the window frame. The cross rail 10 has its opposite ends cut to outwardly overlap the relative ends of the adjacent outer limb of the vertical rails to provide a weather sealing corner joint. The channel of the upper cross rail has a depth sufficient to allow the upper sash to be elevated a degree to release it from its latching connection with the side or vertical rails whereupon it can be swung outward for removal from the rails.

The screen sash 18 is inserted or removed from the upper section of the side rails and normally is positioned within the lower channel portion thereof immediately beneath the upper sash, with the inner side of the screen frame flush with the inner side of the upper sash. As the opposite ends of the screen sash are cut to an offset portion of the channel to provide a guideway for the inner second lower sash 20, the width of the screen sash is slightly less than that of the upper sash.

The second lower sash 28 has its opposite ends engaged and slidable within the guideway or groove formed in the lower section of the sash rail to guide in elevating the sash for removal or to station it to an open position in an adjoining relation with the upper sash, as shown in Figures 2 and 8. The second lower sash in either its closed or open position confines the screen sash against a lateral displacement so that no other means need be employed to hold the same in place while in service.

The lower auxiliary light or storm sash at its lower end is provided with a finger hold, and at
each of its opposite ends respectively with a latch 21 shown as of slide bolt type. The type of locking hardware, however, is optional. The outer end of each lock bolt 22 of the latches 21 in its locking position overlies the outer side of its relative inner limb or inside of side rail 21 and in its locking position frictionally contacts therewith for holding the sash in any partially elevated position. In a full open position of the lower light sash, the bolt interlocks with an eye 23 formed integral with the guide limb 11, or may embody a clip secured to the rail limb.

With the side rails 1 incorporated with a top and sill rail into an integral frame, as shown in Figure 15, the top cross rail is of the same stock and cross-sectional form as the side rails, and in addition embodies a channel rail section 24 having its outer limb engaged and clamped within the fold-over edge of the flange 5 of the rail, to function substantially as the top rail section 19 previously described. A channel form of cross or sill rail 25 connects with the lower ends of the side rails 1 into which the lower end of both screen and storm sash 10 and 20 respectively seat.

The frame structure for the upper and lower auxiliary or storm sash, preferably is of conventional sheet metal strip material of channel form type which claps over the sides and provides for a minimum thickness of frame, approximately one quarter of an inch, sufficient to furnish the necessary stability. This also follows for the structure of screen frame as representative of a conventional type of manufacture, having as one side a channel into which the screen fabric is clinched by a channel form of beading or clipping strip.

For individual application the vertical and cross rails are made up in stock lengths easily cut and trimmed for a length measurement of a given size frame which likewise follows for sheet metal strip material for the light and screen frames, so that fabrication and installation is extremely simple and inexpensive.

Normally the aligned upper light and lower sash rail remain stationary in their relatively located positions within the guide or side rails and generally are only removed to gain access to the exterior side of the main sash, should the main sash be of sliding type. This also follows for the second lower auxiliary light sash which, however, is slidably sustained and located in an elevated or open position, in which position it remains during the summer season and serves to bind the screen frame against lateral displacement within the side rails. The second or lower auxiliary light sash in its normally full open, elevated position has a sufficient portion of its lower end engaged within the channels of the side rails to withhold the same against outward tilt so that no means need necessarily be included for holding the upper end of the sash against lateral displacement. The lower light sash, however, must be first removed before it is possible to remove the screen sash.

Having described the invention, I claim:

1. For mounting on a conventional window frame provided with outer blind stops, a sheet metal rail fixed to one of said blind stops of Z form in cross section providing relatively offset oppositely extended flanges longitudinally of the rail, one for anchoring the rail to said blind stop, and the second providing an outside stop for confining an auxiliary sash disposed within said rails against outward displacement, a flange project-
tional window frame and an inner flange providing an outer stop for the sash sustained within the frame, an upper sash laterally removable from the frame and adapted to be locked therein, and a screen and light sash relatively adjacently disposed within the lower section of the frame with the screen sash outermost, the side rails for the lower sash portion of the frame forming a channel for slidably mounting the lower sash, adapting the same to be elevated for removal from the frame from the upper sash portion thereof.

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