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METAL STORM WINDOW WITH ROLL SCREEN
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FIG. 1

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This invention relates to storm windows, especially to storm windows particularly adapted to be made from metal and wherein a roll type screen is used in the storm window.

Hitherto many efforts have been made to provide storm window constructions that will meet with complete public approval and acceptance. These storm windows in many instances have been made from wood, whereas other styles of construction have utilized extruded metal shapes in forming storm window frames, sashes and the like. At the present time, many so called "self-storing" storm windows utilize some type of a triple truck construction wherein two window sashes are received in two of the tracks, and the third track receives the screen which is permanently positioned in the window frame. The screen is moved up or down in correlation with movement of one window sash for operative or inoperative positioning of the screen, as desired. Various other types of "self-storing" windows likewise maintain a window, or a screen, in the window opening even when such window or screen presumably is inoperatively positioned. The positioning of a screen in the window frame when the screen is inoperatively positioned is particularly objectionable as it will cut down the attractive appearance of the storm window construction as a whole and will reduce the amount of light that can be transmitted through the window openings.

The general object of the present invention is to provide a novel metal storm window characterized by the use of a roll type screen therewith.

Another object of the invention is to provide a metal storm window wherein a metal to metal contact is avoided between relatively slideable portions of the window construction.

Another object of the invention is to provide a metal storm window which is made from a minimum of extruded shapes and which window is of neat, attractive appearance and can be easily secured to a window frame.

Another object of the invention is to provide novel components of a storm window frame which can be readily engaged with each other to provide a strong weathertight assembly for positioning window sashes in the frame.

A further object of the invention is to provide an adjustable side window positioning means for a storm window wherein pre-cut parts can be easily snugly fitted to a window frame of a house or other building regardless of appreciable variations in the size of such window frame.

Yet another object of the invention is to provide a screen in a metal storm window wherein the screen can be easily stored in a hidden compartment when the screen is not required for use in the storm window and with the screen being easily engaged with or disengageable from an associated storm window sash.

A further object of the invention is to avoid the alignment of either mitered or abutted joints in axially aligned portions of the storm window construction in order to avoid the possibility of direct air flow paths existing in the storm window construction.

Further objects of the invention are to provide a new type of a storm window which is of compact, sturdy construction and which can be relatively easily assembled by substantially unskilled labor; to provide novel extruded metal shapes having desirable properties in a storm window; to provide a compact attractive member for positioning a roller screen in a storm window; to provide a novel means for securing components of a metal window sash together; and to provide novel channel frame means adapted to be readily secured to a window frame or a similar member.

The foregoing and other objects and advantages of the invention will be made more apparent as the specification proceeds.

When referring to the accompanying drawings and the following specification, corresponding numerals are used to refer to corresponding parts to facilitate comparison between the drawings and specification.

It should be understood that one currently preferred embodiment of the invention is shown in the drawings and is described hereinafter in detail, and that the drawings comprise the following:

Fig. 1 is an inside front elevation of the storm window of the invention;

Figs. 2 through 6, inclusive, are detailed enlarged sections taken on line 2—2, 3—3, 4—4, 5—5 and 6—6, respectively of Fig. 1;

Fig. 7 is an enlarged fragmentary section through a corner of a window sash of the invention showing how the components thereof are secured together;

Fig. 8 is a fragmentary enlarged elevation showing a lower corner of the upper sash and the latch positioning means therefore;

Fig. 9 is an enlarged fragmentary elevation of the lower part of the lower window sash and its engagement with the upper portion of the roller screen;

Fig. 10 is a fragmentary vertical section taken on line 10—10 of Fig. 9;

Fig. 11 is an enlarged fragmentary rear elevation of an upper corner of the storm window of the invention; and

Fig. 12 is a detailed vertical section to show the roll screen housing support and the bottom rail of the storm window.

The metal storm window of the invention includes two double hung metal sashes of special construction, a roll screen assembly, supplementary rails extending the window height and having laterally outer closed channel portions with each such channel having a lug extending axially inwardly of the window, which supplementary rails have axially outwardly positioned sash engaging flanges and axially inwardly opening positioning recesses, upper and lower sash parting strips engaged with different vertical portions of the supplementary rails and having flanges for engaging the positioning recesses in order to engage such parting strips with the supplementary rails. The lugs on the supplementary rails also engage parts of the sash parting strips to aid in positioning such strips and retain them in engagement with the associated portions of the supplementary rail.

In describing the storm window of the invention, the word axially is used to describe the line normal to a plane defined by the storm window of the invention and with the inner surface of the storm window of course being the surface facing within the building.

Attention should now be directed to the details of the construction shown in the drawings, and the storm window of the invention is indicated as a whole by the numeral 1 and such storm window assembly is positioned within a conventional window frame 2 that forms part
of a residence, office building, or the like. The storm window includes a pair of double hung sashes comprising an upper sash 3 and a lower sash 4 with a housing 5 being provided at the lower portion of the storm window 1 for storing a roll screen therein.

**Storm window frame and runner means**

The storm window of the invention comprises an outer adjustable connecting window frame for engaging the building frame, a plurality of metal channels 6 which extend vertically of the storm window 1 the entire height of the frame 2, and a similar top metal channel 7 that is of the same sectional shape as the side channels 6. These channels 6 and 7 all have an axially outwardly directed lip or flange 8 thereon and suitable holes (not shown) are drilled in the channels 6 and 7 in the corner provided between the flanges 8 and the remainder of the channels so that screws or nails can conveniently be engaged with such holes for securing the channels to the frame 2. The channels 6 and 7 are all positioned with the closed base portions thereof extending laterally outwardly past the frame for the storm window 1, and axially inwardly extending line 9 are provided on the laterally inner edges of the axially outer legs of the channels for a purpose to be hereinafter described.

To position the sashes 3 and 4 in the window, supplementary rails 10 engage the side channels 6 and extend the height of the storm window 1 whereas a similar supplementary rail 11 is engaged with the top channel 7 for providing sash engaging means for that portion of the window.

The supplementary rails 10 and 11 are provided with a substantially U-shaped laterally outwardly positioned base portion, the axially inner legs 10e and 11e of which are short in length and have lugs 12 directed axially inwardly of the storm window 1 and formed integrally therewith. The axially outer legs 10b and 11b of the supplementary rails extend laterally inwardly of the storm window 1 and protrude appreciably from the associated channel members 6 and 7, all as best shown clearly in Figs. 2 through 4. The laterally inner portions of the supplementary rails include sash engaging portions 13 that terminate on their axially outer surfaces in sash engaging flanges 14 immediately adjacent the sash receiving portions 15 of the supplementary rails on a laterally outer portion thereof. The sash receiving portions 13 are provided with suitably contoured angularly positioned receiving recesses 15 directed laterally outwardly but axially inwardly of the storm window on an axially inner surface thereof.

The upper sash engaging portion of the storm window frame means is completed by means of roughly L, or Z-shaped upper sash parting strips 16 positioned both in upper lateral margins of the supplementary rails 10 and 11 in the top supplementary rail 11. The upper sash parting strips have sash engaging flanges 17 on their laterally inner margins, whereas an angularly positioned axially outwardly directed lip 18 is also provided on each of the upper sash parting strips and these lugs engage the recesses to aid in positioning the upper sash parting strips 16. Fig. 2 for example shows the lug 18 on the upper sash parting strip 16 and how it is contoured to mate snugly with the complementary recess 15 provided in the supplementary rail 10. The other upper sash parting strips 16 are similarly engaged with the supplementary rails associated therewith. The flanges 17 of the upper sash parting strips, and the flanges 14 of the supplementary rails cooperate to form a channel in which the upper sash 3 is positioned. The laterally outer ends of the upper sash parting strips 16 have axially outwardly directed fingers or flanges 19 provided thereon which bear against the axially inner legs 10e and 11e of the channel shaped bases of the supplementary rails 10 and 11 and, when the storm window is assembled, aid in maintaining the upper sash parting strips 16 snugly positioned between the side and upper channels 6 and 7 and the supplementary rails associated therewith. The lugs 12 on the supplementary rails 10 and 11 are peened, or notched or crimped over at several spaced portions thereof against the adjacent flanges of the upper sash parting strips 16 to retain the parting strips in engagement with the supplementary rails prior to the engagement of the supplementary rails with the channels 6 and 7, and a tight assembly of the channels and rails is provided.

A bottom sash parting strip 20, shown in Fig. 3, is provided on each lateral margin of the sash 3, and it is of generally U-shaped in section. The lower sash parting strips 20 have lugs or flanges 21, like the lugs 18 on the upper sash parting strips 16, extending axially laterally inwardly and axially outwardly of the storm window and such lugs 18 are snugly received in the lower portions of the recesses 15 provided in the supplementary rails 10. Likewise, an axially inner, laterally outer portion of each of the lower sash parting strips 20 has a flange 22 thereon which engages the leg 19b of the supplementary rails 10. The lugs 12 likewise are folded or peened over at several places against the surface of the flanges 22 to retain the supplementary rails 10 and the lower sash parting strips 20 in engagement so that the unit so provided can be slid into engagement with the channels 6.

The axially and laterally inner portion of the bottom sash parting strips 20 have shoulders 23 provided therein to aid in defining a bottom or lower sash receiving laterally inner end in such parting strip. These shoulders 23 also aid in providing a narrowed screen receiving open portion in the lower sash parting strips 20 to prevent the entry of bugs or foreign matter around the lateral portions of the roll screen, as hereinafter described in more detail.

**Window sash construction**

The upper and lower sashes 3 and 4, respectively, both are made from metal sash members 24, Figs. 2 and 7, which are substantially U-shape in section. The laterally inner portions of the sash members 24 engage with and position a window pane 25 by suitable plastic tapes or glazing channels 26.

In order to prevent the window sashes from having metal edges for abutting on the metal runners provided in the supplementary rail and sash parting strips of the storm window, it is an important feature of the invention that plastic runner strips 27 be provided for forming the actual contact between the window sash and the associated positioning means. These runner strips 27 may be made, for example, from any suitable plastic material, such as polyethylene. The runner strips are of substantially T-shape in section and with the opposed edges of such plastic strips being wider than the associated sash members 24. It will be noted that the laterally outer portions of the sash members 24 have a plurality of shoulder means or notches 28 provided therein and directed laterally inwardly thereof. Complementary shoulders or notches indicated at 27 are provided on the runner strips 27 so that such runner strips can be pressed into engagement with the outer edges of the sash members and be locked snugly together thereby with the shoulders 127.

Fig. 7 shows how the corners of a sash frame are assembled and a corner key 28 is provided that is slidably engaged with the laterally outer portion of a sash member 24a intermediate the web thereof and the associated shoulder 124. This corner key 28 is provided with a pair of recesses 29 in the intermediate thereof so that a web 30 of the sash member 24a can be punched out and moved out of its normal position into the recesses 29 to retain the corner key 28 locked to such sash member 24a, as indicated in the drawings. The other sash member 24b is positioned normal to and abutted against the end of
the sash frame member 24a and a hole 31 is drilled in the web of such sash frame member. A screw 32 extends through the web of the sash frame member 24a and engages a tapped hole in the corner key 28 to lock the sash frame members in assembled relation.

Fig. 6 of the drawings shows how the upper sash 3 may have a sash member 24x at the lower margin thereof, and the lower sash 4 has a sash member 24y at the upper margin thereof so that complementary shaped engaging surfaces can be provided on the adjacent meeting rails of such sashes, even though the sashes are axially offset as shown in the drawings to provide a snug, airtight fit between such window sashes when they are closed.

### Screen positioning means

As indicated in Fig. 5, the same means are used to position the roll sash housing 5 in the storm window 1 as are used to complete the outer framework of the storm window 1 for filling the frame 2.

Fig. 5 shows that the housing 5 suitably positions a roll type screen 33 therein which screen is shown received upon a roll 34 of a conventional construction journalled in the housing 5 by conventional means. The upper end of the screen 33 may have an edge member 133 associated therewith by being folded over the screen edges and such member 133 and screen are double back upon themselves to be snugly received in a recess in a screen rail 35. This screen rail 35 has an upwardly extending flange 36 loosely received in the downwardly open edges of a lower sash member 24m of the lower sash 4. The screen rail 35 also has an axially inwardly and downwardly directed flange 37 on an inner portion thereof which aids in sealing the lower sash 4 to the frame portion of the storm window 1 when the screen 33 is in its stored position. A bottom supplementary rail 38 is provided and it extends between the supplementary rails 10 at the lower ends thereof. Such bottom supplementary rail 38 has an upwardly extending flange 39 thereon engaging the lower surface of the flange 30 on the screen rail and, if desired, suitable sealing means or tape can be carried by the flange 30 on its lower surface to aid in forming a seal between the flange 37 and the flange 39. The bottom supplementary rail 38 also has a special contoured recess 40 on an axially inwardly extending edge flange 41 thereof. A bottom finishing rail 42 is provided and is positioned on the inner surface of the storm window 1 by an edge portion thereof engaging the special contoured recess 40 on the flange 41 of the supplemental bottom rail. The bottom finishing rail 42 is mitered corners that abut against mitered lower ends of the supplementary rails 10.

The height of the bottom portion of the storm window 1 is made adjustable by means of an adaptor plate or strip 43 received between the bottom supplementary rail 38 and the bottom finish rail 42. Suitable screw means may extend between these three members, after the adaptor plate 43 has been pulled from its associated positioning means a sufficient distance to rest against the top of the sill portion of the frame 2.

The screen rail 35, Fig. 9, normally has two handles 44 secured thereto by screws 45 to facilitate raising the lower sash 4 and the screen 33 as a unit by unrolling the screen 33 and simultaneously pulling it up as the lower sash is raised.

As a feature of the invention, the lower sash 4 is engaged with the screen rail 35 by means of spring clips 46 secured to the lower portion of the frame of the lower sash 4 and protruding downwardly therefrom for individual engagement. Locking lips 47 on a base portion and the handles 44. By sliding the lower sash 4 downwardly, the clips 46 will automatically ride up over the handles 44 until the lower portion of the clips 46 engage the lips 47 after which unitary movement of the lower sash and roll screen will occur as the lower sash is moved.

It will be appreciated that the lower sash 4 may be retained in any of a number of desired horizontal positions for operatively positioning portions of the screen 33. In the construction shown, the roll screen 33 can be completely stored upon the roll 34 or the lower sash 4 may be lifted several inches to provide a ventilation opening. Thus laterally inner portions of the lower sash paring strips 28 may be removed to provide shoulders 48, Fig. 9, in the lower parts of the lower sash paring strips so that latches 49 that are carried on the screen rail 35 at the laterally outer ends thereof can be urged into such shoulders or recesses 48 to retain the screen and associated means in a given position. The latches 49 are slidably carried in sleeves 50 secured to the screen rail 35. A conventional fastener 50a extends through the sleeves 50 and a slot 51 in the latches 49 to retain the latch in engagement with the screen rail. Spring means 52 continually urge the latches laterally outwardly of the sash, but such latches can easily be pulled laterally inwardly of the lower sash to permit free sliding movement of the sash. Similar shoulders to the shoulders 48 are provided in the upper portions of the lower sash paring strips to provide a top positioning means for the lower sash and the roll screen.

The top sash positioning means, as indicated in Fig. 8, include latches 53 slidably carried in the lower portion of the sash frame member 24s of the upper sash. The latches 53 are urged laterally outwardly of the window sash 3 by coil springs 44 received in slots 55 in the latches. The latches 53 are engaged with the window sashes by pins 56 extending through the slots 55 and engaging the sash frame. The latches 54 may have little knobs or handles 57 provided on their laterally inner ends to facilitate pulling the latches in for free sliding movement of the upper sash 3.

It will be realized that the side and upper channels 6 and 7 may be moved laterally with relation to the storm window to adjust it to the size of the frame 2 in which the storm window is positioned. However, the locking lips 9 on the channels are adapted to engage similar locking lips or lugs 58 on the adjacent surfaces of the supplementary rails 10 and 11 prevent any disengagement of the side and upper channels from the supplementary rails while providing freedom of movement for the channels to adjust to the window frame size.

Fig. 9 of the drawings best shows that the edges of the screen 33 and edge member or screen leader 33 protrude laterally of the storm window sufficiently to provide substantially a sealed relationship between such screen and the shoulders 23, which may protrude any desired amount, on the lower sash paring strips 28.

Suitable brackets 59, Fig. 12, are provided to secure the screen housing 5 to the associated bottom supplementary rail 38. The brackets 59 are usually removably secured to bracket portions on the bottom supplementary rail at the lower portion thereof. The brackets 59 extend upwardly of the storm window at the lateral margins of the housing 5 and have offset top flanges 60 extending over the top of the housing 5 in from the edges thereof. Self-tapping screws 61 or other conventional means extend through the flanges 60 and engage the housing 5 to position it. The bottom supplementary rail 38 has offset brackets 58a on its lateral margins for lying flush over the lower ends of the side supplementary rails 10 to be secured thereto by screws or similar means. The housing 5 is further positioned by lugs 62 on the brackets 59 that engage a lower portion of the housing 5 to hold it in spaced relation to the bottom supplementary rail. Such suspending of the screen housing is desirable to secure it against rotation in a counterclockwise direction, due to the spring rotational forces exerted on the screen as it is raised or lowered.

In order to provide a finished appearance for the storm window 1, and to provide the connection between
portions of the side and upper channels, corner plates 63 are provided for being secured over the corners of the frame means of the storm window 1. These plates 63 are of proper contour for engaging the outer surfaces of the channels and supplementary rails 10 and 11 to be complementary in shape thereto to provide a connecting member extending between the spaced end portion of such outer channels 6 and 7 with variations in the size of the frame 2 in which the storm window is positioned.

The screen 33 is made from any suitable material, and usually is made from plastic material to provide a compact screen assembly.

Spring clips 64 are secured to the upper sash parting strip 16 that engages the supplementary rail 11 and extends downwardly therefrom to engage the lower sash 4 when it is raised.

While the invention particularly relates to storm windows made from metal such as aluminum, the novel construction of the invention may be made from wood or other suitable materials when desired.

Nails or screws 67 extend through holes provided in the flanges 8 on the channels 6 and 7 to permit such sections means to extend directly into the frame 2 and facilitate positioning the channels in position.

It should be noted that the supplementary rails 10 and 11 have mitered corners engaging with each other whereas other joints in the storm window 1 adjacent such mitered joints are of different shapes to prevent any possibility of a direct path for air leakage through the storm window assembly.

The entire storm window construction is tightened and reinforced by the use of contoured reinforcing corners 65 that are secured, as by the use of screws 66, to each of the corners formed between the supplementary rails 10, the top supplementary rail 11, and the lower corners of the supplementary rails 10 were they abut against the bottom finish rail 42. The bottom finish rail 42 has an outer periphery corresponding to the outer periphery of the supplementary rails so that corresponding corners 65 can be engaged with the outer surfaces of the supplementary rails to aid in securing such members together into a tight, sturdy unit.

While one complete embodiment of the invention has been disclosed herein, it will be appreciated that modification of this particular embodiment of the invention may be resorted to without departing from the scope of the invention as defined in the appended claims.

I claim:

1. In a storm window, a pair of supplementary rails of uniform sectional contour on the sides of the window and one such rail at the head of the window, said supplementary rails having laterally spaced recess and lug means for securing other rails thereto, top sash parting strips engaging the upper and the head portions of said supplementary rails to provide a top sash positioning means therewith, and generally U-shaped in section bottom sash parting strips engaging only the lower portions of said supplementary rails to form lower sash engaging means, said top sash parting strips and said bottom sash parting strips having vertically aligned flange means thereon engaging said recess in said supplementary rails and with said parting strips also being engaged by said lug means to retain said rails in assembled relation.

2. A metal storm window comprising laterally inwardly extending the height of the window and across the top thereof, said supplementary rail means including laterally outer channel portions engaging said channels means, and a laterally inner section having an axially outwardly positioned sash engaging flange and a contoured recess; top sash parting strip means engaging said supplementary rail means at the top of the window and the upper lateral margins thereof, said top sash parting strip means having a sash engaging flange thereon and a lug section snugly received in said recess to position said sash engaging flanges in association for receiving a sash therebetween, said top sash parting strip means also engaging said channel means as a part of said channel portion of said supplementary rail means in positioning said top sash parting strip, and a pair of bottom sash parting strips of generally U-shape in section in vertical alignment with said top sash parting strip means and positioned between a leg of said channel means and a portion of said supplementary rail means, said bottom sash parting strips having shoulders on the laterally inner surface thereof for forming sash positioning means therein.

3. In a metal storm window, a supplementary rail extending the window height and having a laterally outer closed channel portion with a lug on the axially inner thereof extending axially inwardly of the window, said supplementary rail on its axially outer leg having a sash engaging flange and an axially inwardly slanted and open positioning recess, and upper and lower sash parting strips engaged with different vertical portions of said supplementary rail and having flanges engaging said positioning recess; said lug being secured to parts of said sash parting strips to aid in positioning such strips, said upper and lower sash parting strips being of different sectional contours and extending laterally inwardly different distances.

4. In a metal storm window, a supplementary rail extending at least substantially the window height and having a laterally outer closed channel portion having axially spaced legs with lug means on the axially inner leg thereof extending axially inwardly of the window, said supplementary rail on its axially outer leg having an axially outwardly positioned sash engaging flange and an axially inwardly open angularly laterally outwardly directed positioning recess, and sash parting strips engaged with different vertical portions of said supplementary rail and having lugs complementary to and engaging said positioning recess, said sash parting strips having portions bearing on the axially inner leg of said supplementary rail adjacent said lug, said lug and lug means engaging parts of said sash parting strips to aid in positioning such strips.

5. In a storm window or the like, a U-shape channel for positioning on the sides of a window frame and open towards the center thereof, said supplementary rails having U-shaped outer portions individually telescopically engaging said channels and having an elongate leg protruding from said channels and having an inclined axially inwardly directed recess on the axially inner surface of such protruding leg, and lower sash parting strips having axially outwardly inclined legs thereon engaging said recess to aid in securing such strips to said supplementary rails, said lower sash parting strips also extending into said channel and having a generally U-shape open towards the center of the storm window, said lower sash parting strips having spaced shoulders provided on opposed portions thereof, said shoulders being spaced from but adjacent the laterally inner edges of said lower sash parting strips to aid in forming a sash receiving portion on such strips.

6. A metal storm window comprising laterally inwardly open channel means at the top and lateral margins of the window; supplementary rail means extending the height of the window and across the top thereof, said supplementary rail means including laterally outer channel shaped portions engaging said channel means at the top and lateral margins of the window, and a laterally inner section having an axially outwardly positioned sash engaging flange and a recess therein positioned laterally inwardly of the window with relation to said channel
means; top sash parting strip means engaging said supplementary rail means at the top of the window and the upper lateral margins thereof, said top sash parting strip means having a sash engaging flange thereon and a lug section snugly received in said recess to position said sash engaging flanges of said supplementary rail means and said top sash parting strip means in association for receiving a sash therebetween, said top sash parting strip means also engaging said channel means and a part of said channel portion of said supplementary rail to aid in positioning said top sash parting strip.

7. In a storm window or the like, a U-shaped channel for positioning on the sides and top of a window frame and open towards the center thereof, supplementary rails having U-shaped outer portions with axially spaced legs therein which portions individually telescopically engage said channels on the sides and top of the window and having legs protruding from said channels and forming a sash engaging flange, said protruding leg having an axially inclined recess therein on the axially inner face thereof, and upper sash parting strips also extending into said channel and having lug means thereon received in said recess, said upper sash parting strips being secured to the other leg of said U-shaped portion of said supplementary rail to secure said strips to said supplementary rails, said upper sash parting strips having a single sash engaging flange thereon.

8. In a metal storm window, a U-shaped channel, a supplementary rail having a laterally outer closed channel portion with a lug thereon extending axially inwardly of the window on an axially inner portion thereof, said supplementary rail having a generally axially inwardly open positioning recess provided in a laterally inner portion thereof, and an upper sash parting strip having means thereon snugly received in said positioning recess to aid in engaging said upper sash parting strip and being of generally L-shape in section, said supplementary rail and upper sash parting strip combining to form a hollow rectangular structure at the laterally outer portions thereof, said lug engaging parts of said upper sash parting strip to aid in forming a generally hollow rectangular unit of said supplementary rail and said upper sash parting strip, the unit of said supplementary rail and upper sash parting strip being received in said channel.

9. In a metal storm window, a U-shaped channel, a supplementary rail having a laterally outer closed channel portion with a lug extending axially inwardly of the window on an axially inner portion thereof, and a sash parting strip of generally L-shape in section, said supplementary rail and sash parting strip having interengaging means on laterally inner portions thereof and combining to form a hollow rectangular structure at the laterally outer portions thereof, said lug engaging portions of said upper sash parting strip to aid in forming a unit of said supplementary rail and said upper sash parting strip, the unit of said supplementary rail and upper sash parting strip being received in said channel.

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