May 18, 1954 E. PEREMI 2,678,478

STORM SASH AND WINDOW SCREEN CONSTRUCTION

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Fig. 1.

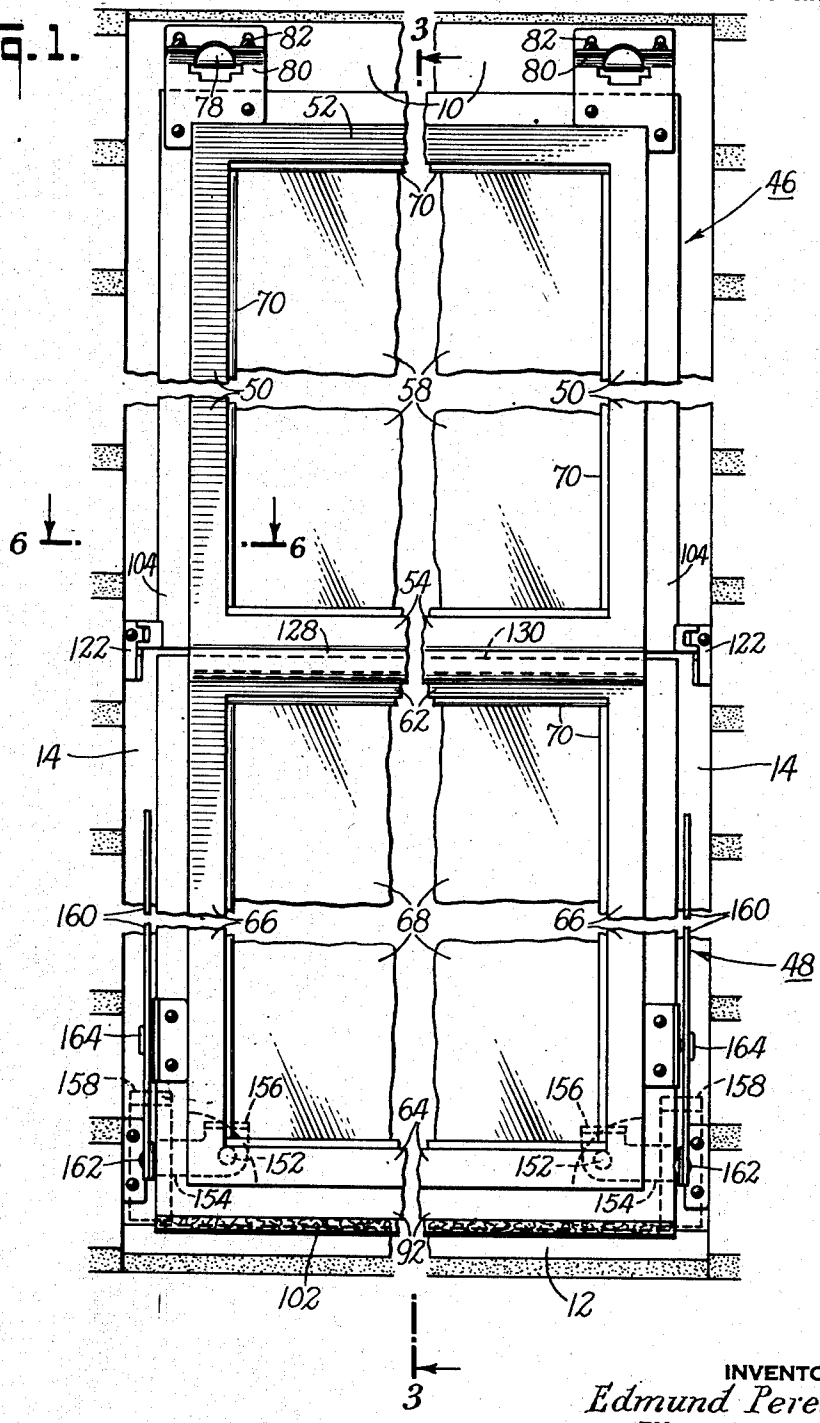


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Fig. 2.

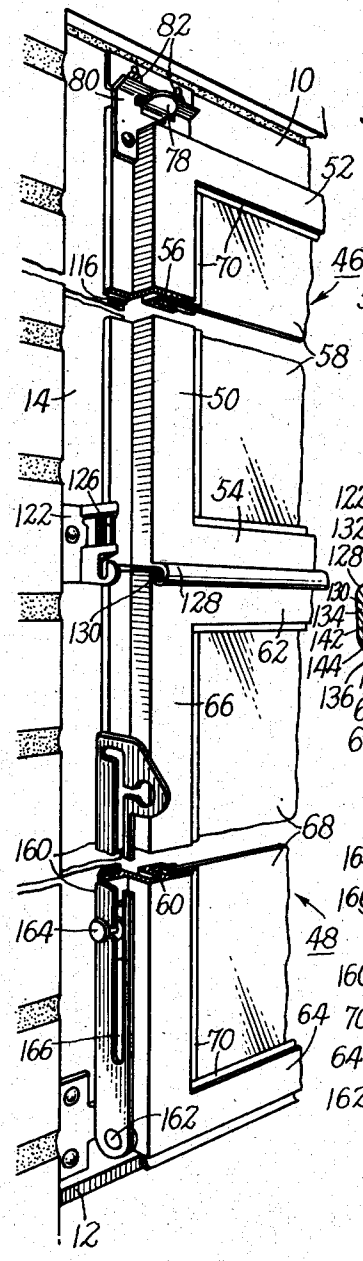



Fig. 3

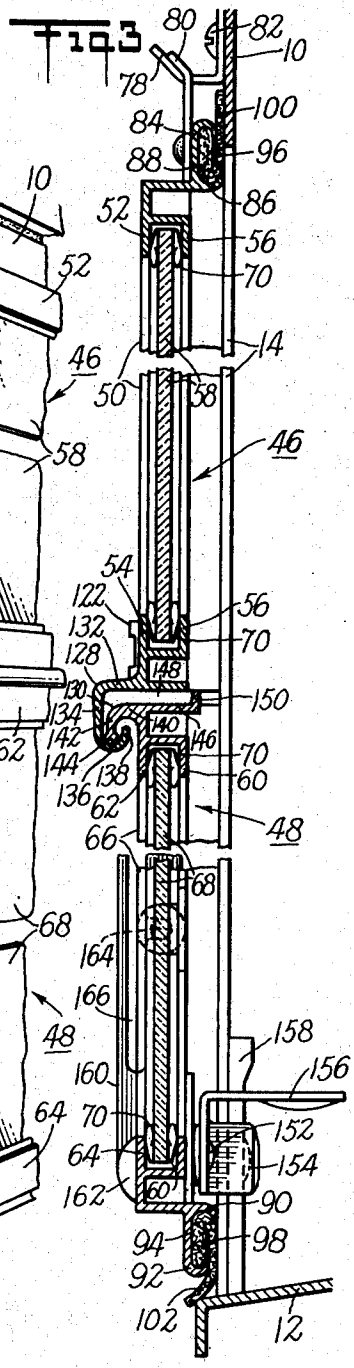
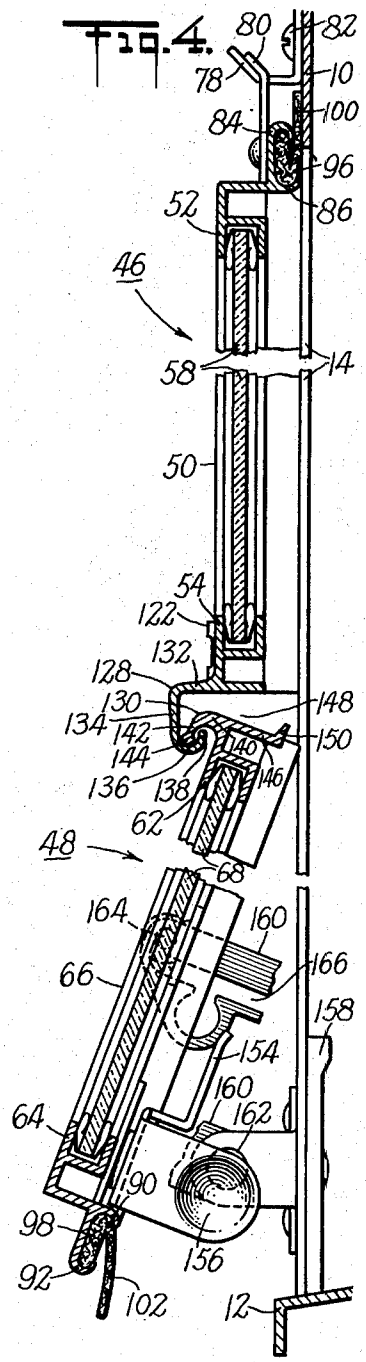



Fig. 4.

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STORM SASH AND WINDOW SCREEN CONSTRUCTION

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Fig. 5.

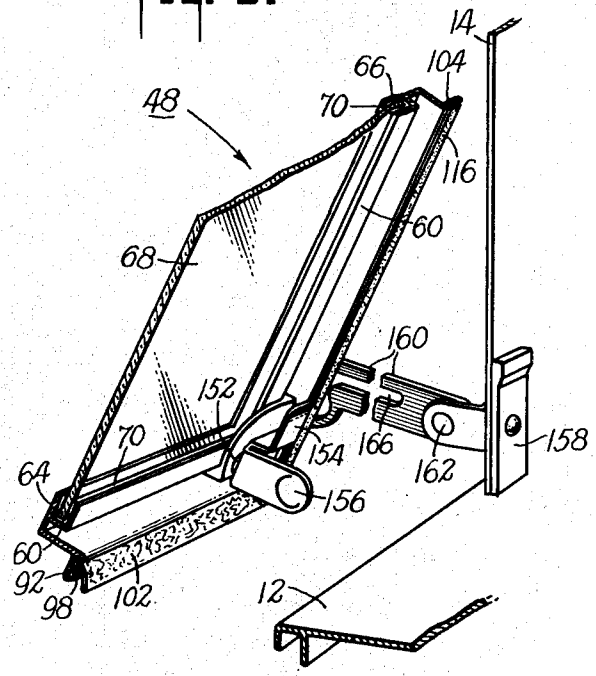


Fig. 7.

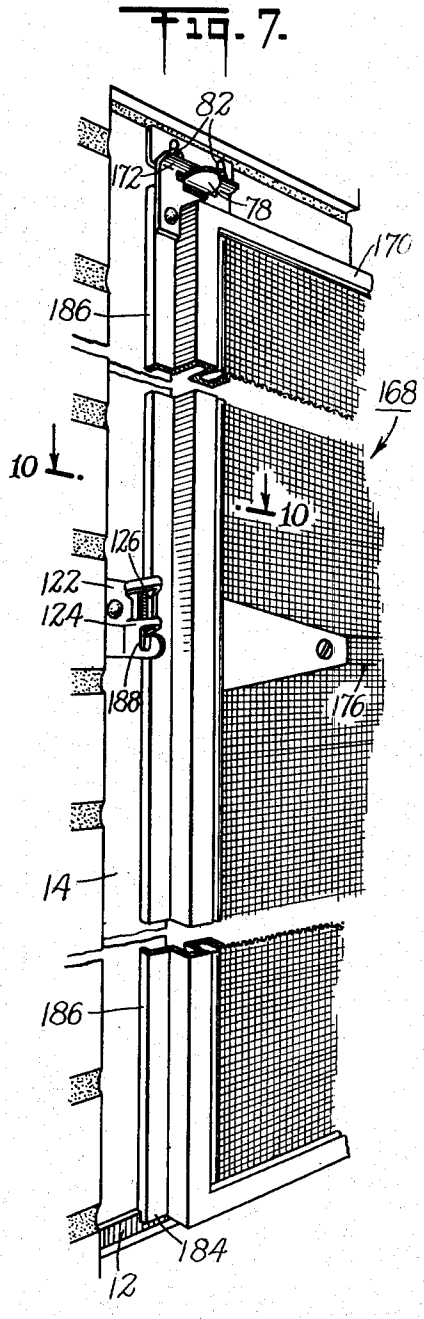


Fig. 11.

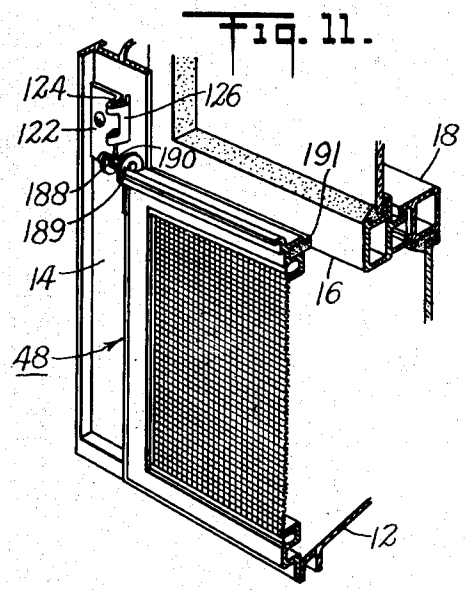


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Fig. 8.

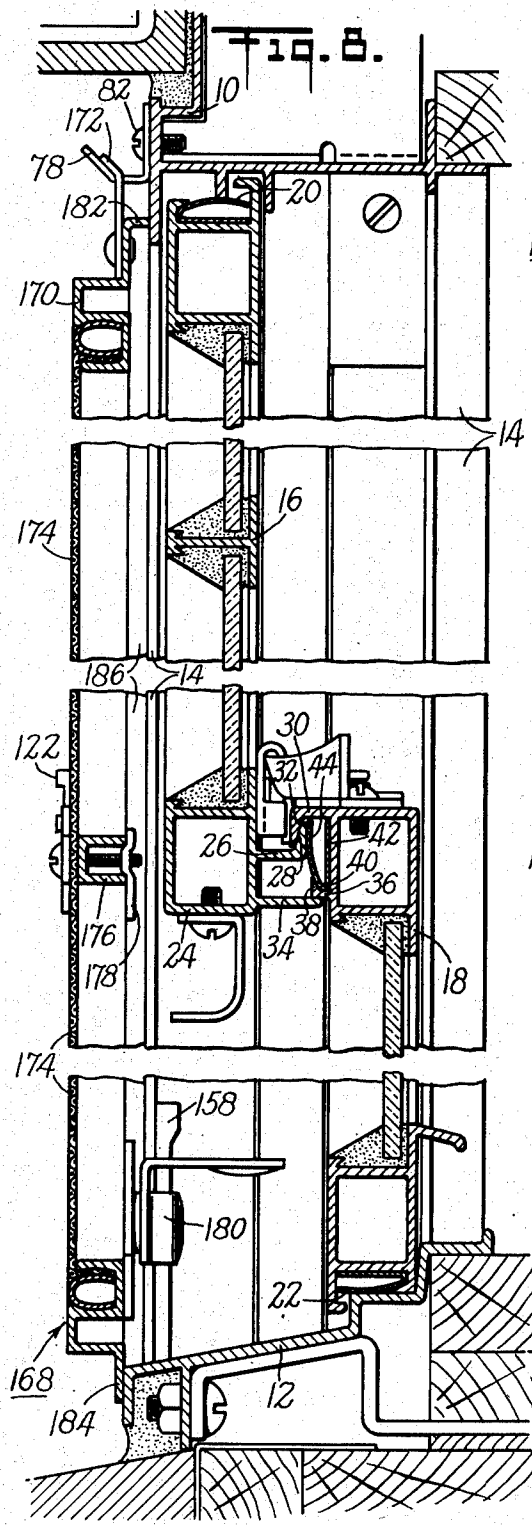



Fig. 9.

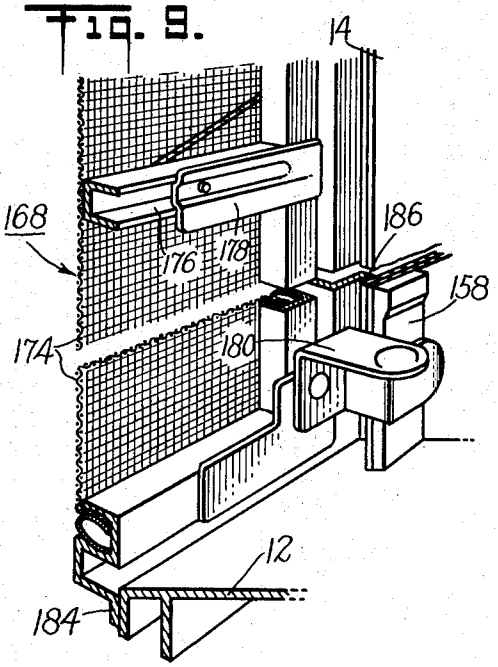



Fig. 6.

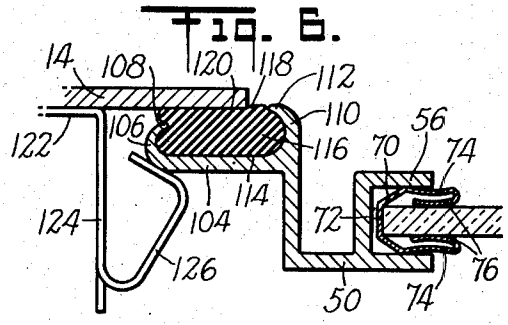
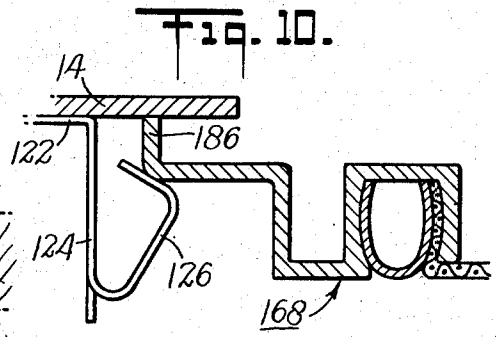



Fig. 10.

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# UNITED STATES PATENT OFFICE

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## STORM SASH AND WINDOW SCREEN CONSTRUCTION

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Application November 18, 1948, Serial No. 60,758

1 Claim. (Cl. 20—55)

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This invention relates to a window construction and particularly the combination of a weather sealed sash and frame structure with interchangeable screen and storm sash structure.

It is a primary object of the invention to construct such a combination as above set forth in which a window screen easily and quickly may be applied and removed, and replaced by a storm window which, also easily and quickly may be applied and removed.

A further object of the invention resides in so constructing the storm window and in so associating it with the weather sealed sash, which are preferably of the double hung type, that a portion of the storm sash may be swung open for ventilation purposes.

It is another object of the invention to provide a multiple sash storm window to facilitate the mounting and demounting, and which is so constructed that the multiple sashes interengage to form a weather tight seal.

Other objects of the invention will appear as the description of the selected embodiment illustrated in the drawings progresses.

In the drawings:

Figure 1 is an outside face view of the embodiment with the storm window in position;

Figure 2 is a fragmentary perspective view with the storm window in position;

Figure 3 is a vertical sectional view on line 3—3 of Figure 1;

Figure 4 is a similar sectional view showing, however, the lower storm window section swung to an open position.

Figure 5 is a fragmentary view from the inside of the window showing the lower storm window section swung open;

Figure 6 is a section on line 6—6 of Figure 1;

Figure 7 is a fragmentary perspective view showing the screen member applied in position;

Figure 8 is a vertical sectional view of the window construction with the screen applied in position;

Figure 9 is a fragmentary perspective view looking from the inside of the screen;

Figure 10 is a section on line 10—10 of Figure 7; and

Figure 11 is a fragmentary perspective view showing the manner of mounting a half screen.

The invention is illustrated as embodied in connection with a metallic double hung window construction which includes a frame having a header 10, a sill 12 and jambs 14 and double hung sashes 16 and 18, which may be of any desired construction as, for instance, such as shown in the drawings, by way of example, features of such construction being substantially shown and

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described in United States Letters Patent No. 2,257,123, dated September 30, 1941 and No. 2,304,063, dated December 8, 1942, and including weather strip sealing means 20 between the header and the upper rail of the upper sash, weather sealing means 22 between the sill and lower rail of the lower sash 18, and weather sealing means between the jambs and side sash rails which may be such as shown and described in United States Letters Patent 2,250,723, dated July 29, 1941. The meeting rail 24 of the upper sash is provided with an inwardly and upwardly extending flange 26 having an inclined face 28 that extends substantially the width of the sash. The upper or meeting rail of the lower sash is provided with a complemental flange 30 that extends outwardly and downwardly substantially the width of the sash and is provided with an inclined face 32 that is complemental to the face 28 and is adapted to have pressure surface contact therewith when the sashes are closed, thus providing one point of sealing at the meeting rails. Outwardly from the lower sash upper meeting rail and inwardly from the upper sash lower meeting rail extend flanges 34 and 36 which are adapted to overlap and have pressure contact when the sashes are closed, thus providing a second sealing point between the meeting rails of the sashes, the two pressures above mentioned being in directions substantially normal to each other. To provide an additional weather seal between the meeting rails of the sashes a substantially V-shaped resilient, metallic (preferably stainless steel) weather strip is disposed between the two pairs of aforesaid overlapping flanges. The flange 36 is provided with a bead 38 which forms a retaining seat for the apex of the weather strip 40. One leg 42 of the weather strip extends upwardly between the flanges 30 and 36. The other leg 42 of the weather strip also extends upwardly between said flanges and its free end and adjacent face are adapted to forcibly engage the inner face of the downwardly extending portion of the flange 30 when the sashes are open; when the sashes are closed, however, the upwardly extending portion of the flange 26 lies between said inner face of said flange 30 and said leg of the weather strip, at which time this leg of the weather strip forcibly engages the inner face of the upwardly extending portion of the flange 26, thus forming a third weather seal.

In the above manner the window opening is effectively weather sealed even though it is provided with double hung slideable window sashes.

It has been found desirable to further seal the window opening during the colder seasons and to effectuate such sealing this invention contem-

plates an auxiliary sealing assembly which shall be termed a storm window for convenience of expression.

In its preferable form the storm window includes an upper sash 46 and a lower sash 48 constructed, preferably, of extruded aluminum alloy. The side rails 50 and upper and lower rails 52 and 54 respectively of the upper sash 46 are provided with glazing channels 56 for the reception of the light 58. The lower sash 48 is provided, similarly, with channels 60 in the upper and lower rails 62 and 64, respectively, and the side rails 66 for the reception of the light 68.

The lights 58 and 68 are retained in and weather sealed in the said channels by weather sealing strips 70 that substantially completely extend around the edges of the lights. This weather sealing strip, which is resilient and preferably of stainless steel, comprises a base 72 which may seat in contact with the light edge. From this base, spaced divergent legs 74 extend and engage the adjacent faces of the channel forming flanges of the sashes. The legs then are turned inwardly and converge toward the base as at 76 to engage both faces of the light. The forcible engagement between the leg portion 74 and the sash and between the leg portion 76 and the light is of such order of magnitude that the light is retained in the channels of the sash and is weather sealed.

The upper storm sash 46 is swingably, removably and adjustably supported on the header 10 of the window frame by hangers which include complemental, separable hinge members 78 and 80, one of which is vertically adjustable, as for instance, the member 78 is adjustable by means of the screw and slot arrangement 82 shown in the drawings.

A flange 84 that extends upwardly from the upper rail of the upper sash 46 extends thence inwardly and downwardly to complement a flange 86 that extends inwardly and thence upwardly to, together, form a channel 88 having an open throat that extends substantially the length of said upper rail.

A flange 90 extends inwardly and thence downwardly from the lower rail of the lower sash 48 to complement a flange 92 that extends downwardly and thence inwardly and upwardly to, together, form a channel 94 that has an open throat that extends substantially the length of said lower rail.

Weather seals 96 and 98 are mounted in these channels 88 and 94 and may be provided with tongues 100 and 102 which are of resilient, compressible material such as felt or rubber or plastic compound.

The tongues extend substantially the length of the respective channels and the tongue 100 is adapted forcibly to engage the outer face of the frame header 10 and the tongue 102 is adapted forcibly to engage the sill 12 when the storm window is closed. This arrangement weather seals at the top and bottom.

The sides of the storm window are weather sealed as follows (see Figure 6): each side rail of each sash 46 and 48 is provided with a laterally extending flange 104 which flange thence extends inwardly as at 106 and thence backwardly on itself as at 108 to complement a flange 110 that extends inwardly and thence laterally, as at 112, toward the portion 108 of the flange 104 to, together, form a channel 114 that has an open throat that extends substantially the length of said sash side rail. A compressible, resilient weather seal 116 is mounted in each side channel and may have a tongue portion 118 extending from said throat and which is adapted forcibly to engage the adjacent face of the frame jambs 14 as at 120 to weather seal the sides of the storm window.

The form of the weather seals above described is the preferred embodiment, but it will be understood that other forms of weather seals may be employed.

The storm window may be constructed as one unit but as above indicated it is preferably formed of two sashes such as illustrated at 46 and 48. In this construction the upper sash 46 is retained in position on the window frame by clips 122. Each of these clips comprises a body portion 124 that is adapted to be secured to the jamb and a resilient cam latch 126 which is adapted to engage the adjacent flange 104 to retain the sash in position. The cam form and resiliency of the latch makes it possible to snap the sash into its operative and secured position.

The lower sash 48 is supported by the upper sash 46 as follows: The lower rail of the upper sash 46 is provided with a separable hinge element 128 and the upper rail of the lower sash is provided with a complemental separable hinge element 130. The hinge element 128 is in the form of a flange that extends outwardly, at 132, downwardly, at 134, inwardly, at 136, and thence upwardly at 138, forming a trough shaped inwardly opening lip. The hinge element 130 comprises an outwardly extending flange 140 that thence extends downwardly at 142 terminating in a beadlike edge 144 that loosely pivots in the troughlike lip 138 to permit the sashes to swing relative to each other.

It will be noted that the flange 140 is spaced from the flange 132; extending inwardly from the flange 140 is a shelf 146 which establishes a condensation receiving space 148 to receive the water of condensation that flows from the upper sash 46 to the shelf 146. At the inner portion of the shelf 146 a lip 150 extends upwardly of the upper sash to receive and retain the water of condensation on said shelf and to permit it to flow outwardly to be released from the ends of the trough of the lip 138.

It will be seen that the installation and removal of the upper and lower sashes is a relatively simple operation that can be effectuated from the inside of the room. It is simply necessary to engage the separable hanger or hinge members 78 and 80 while the lower end of the upper sash is outwardly swung and to then swing said lower end inwardly past the latches 126 which will cam outwardly and then automatically move to locking position. The upper sash having been thus placed the bottom of the lower sash 48 is placed outwardly somewhat further than is shown in Figure 4 and the bead of the flange 140 engaged in the trough of the lip 138. Thus engaged the lower sash will be supported by the upper sash and the lower end of the lower sash may then be swung inwardly to close the window. As the upper sash is swung to closed position the weather sealing tongue 100 will be forcibly engaged with the frame header and as the lower sash is swung to closed position the tongue 102 will be forcibly engaged with the frame and sill 14. Moreover the swinging of the sashes to closed positions as described will forcibly engage the side sash weather seals 116 with the frame as shown in Figure 6.

It is to be noted especially that it is conven-

ient for the installer to observe the hinge elements 78 and 80 from the inside of the room which will, of course, facilitate interengagement of these elements. Moreover, from the inside of the room the installer may observe the open inside position of the trough lip 138 between the lower rail of the lower main sash and the lower rail of the upper main sash when the former is raised to permit the installation of the storm sashes. This will make it possible easily to engage the interengaging flanges 130 and 132 during the installation of the lower sash 48.

In order that both the upper and lower sashes 46 and 48 may be locked in closed positions there is provided a locking arrangement in connection with the lower sash. In the illustrated embodiment at least one pivoted latch is employed. This latch, which is pivoted to the lower sash at 152, includes a detent portion 154 which is preferably resilient and a thumb piece 156, the detent portion being adapted to be pivotally moved into forcible engagement with the window frame or upper main sash stop 158 with which, because of its form and characteristics, it has a cam locking action.

In order that the lower sash 48 may be held in open position such as shown in Figures 4 and 5 stay bars 160 are provided. These stay bars may be pivoted to the window frame at 162 at both sides of the sash and have slidable pivotal connection with the sash through the pins 164 and slots 166.

In order that the sashes may be interchangeable with a full length screen the invention contemplates the use of a sash 168 such as shown in Figures 7, 8, 9 and 10. This sash is provided on its upper rail 170 with a hinge element 172 adapted to interengage with the hinge element 78 already described to support the sash. This sash may be provided with a screen 174, with a strengthening bar 176 which carries a finger pull clip 178, and with the latch, indicated by 180 in Figure 9, which is of the construction already described. The upper rail of the sash 168 is provided with an inwardly extending seal 182 which is adapted to engage the frame header, the lower rail is provided with a downwardly extending seal 184 adapted to engage the sill and the side rails are provided with inwardly extending seals 186 adapted to engage the frame jambs.

As in the case of the upper sashes 46 this sash 168 may be secured in position by the clips 124. The lights of either or both of the sashes 46 and 48 may be glazed or screened. Thus it will be possible to combine these sashes to produce various combinations of screened and glazed sashes.

Moreover, when it is desired only to use the lower sash 48 as a screen sash the sash may be adapted to such use. To effectuate this adaptation the clips 124 are provided with notches or hangers 188 for the reception of trunnions 190 such as shown in Figure 11. These trunnions are removably supported by brackets 189 that are removably secured to the upper rail of the screen sash. This sash may be sealed in much the same manner as already described and the upper rail may be provided with a compressible resilient weather seal 191 that contacts the lower rail of the upper main sash.

Thus it will be seen that the invention herein described provides means for sealing a window opening by means of double hung sashes and auxiliary or storm sashes. It also contemplates



the selective interchangeability of upper and lower screen sashes with the storm sashes, as well as the replacement of the storm sashes by a single or full length screen; and the invention contemplates a novel mounting of and sealing of the above referred to window construction elements.

I claim:

In a window construction including a stationary upper sash having a lower rail, a lower sash having an upper rail, means hinging the lower sash to the upper sash for swinging movements of the lower end of the lower sash outwardly in a direction substantially normal to the plane of the upper sash for removably attaching said lower sash to said upper sash and preventing the removal of said lower sash from said upper sash except when the lower end of said lower sash extends outwardly from the plane of the upper sash and said lower sash is lifted vertically, said means comprising: a flange extending downwardly from the lower rail of the upper sash and thence inwardly and upwardly to form a trough-like bearing member having an edge spaced from said lower rail; a flange extending outwardly from the upper rail of said lower sash in vertically spaced relation to the adjacent face of the lower rail of said upper sash and over said edge and thence downwardly and terminating in an edge pivotally resting in said trough-like bearing member; the adjacent faces of said lower and upper rails being spaced apart to permit the downwardly extending portion of the flange on the lower sash to be lifted over the edge of the upwardly extending portion of the flange on the upper sash when the lower edge of the lower sash is moved pivotally outwardly; said space between said lower and upper rails extending from the inner surface of the upper sash to said trough-like member; and an upwardly extending lip on said upper rail of said lower sash for directing moisture of condensation from the inner surface of said upper sash to said space and thence to said trough-like member; said lip also extending inwardly beyond the plane of the inner surface of the upper sash.


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