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J. PAUL

2,242,541

WINDOW CONSTRUCTION

Filed March 4, 1940

Fig. 1.

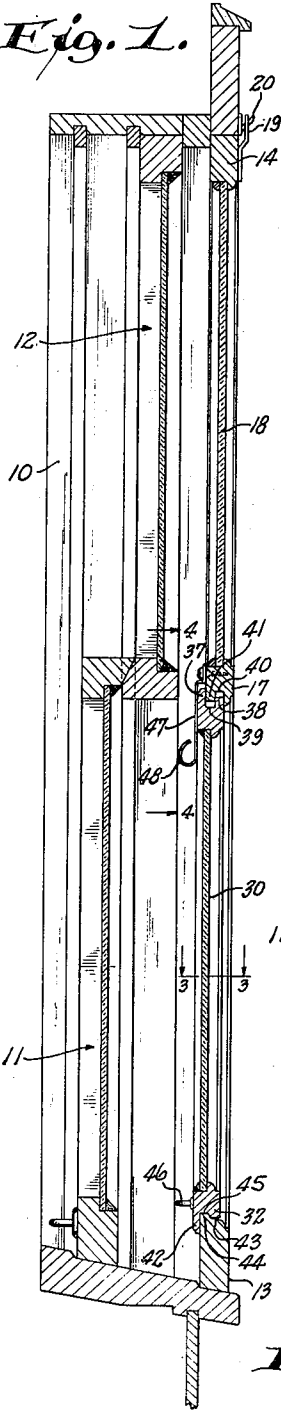


Fig. 3.

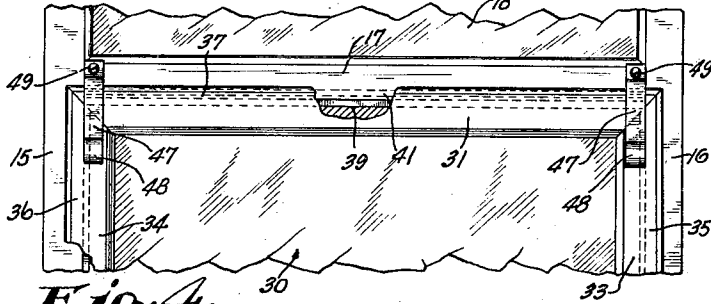
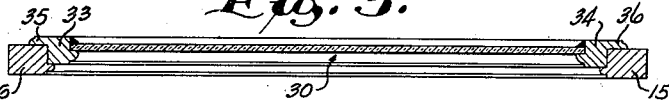


Fig. 4.

Fig. 5.

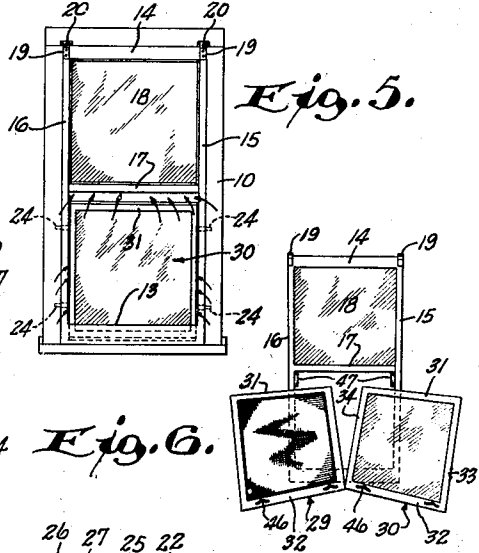


Fig. 6.

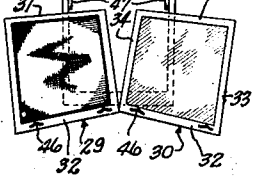


Fig. 7.

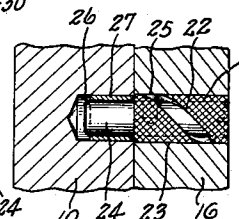
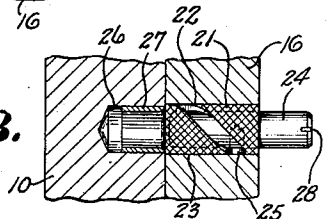


Fig. 8.



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WINDOW CONSTRUCTION

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3 Claims. (Cl. 20—55)

This invention relates to improvements in windows, and more particularly to all-season windows adapted to function as storm sashes and screens.

Heretofore various convertible sashes have been provided which are capable of functioning as both storm sashes and screens. These prior structures, however, have been relatively expensive, have required the manipulation of more or less complicated fastenings to convert the storm window to a screen, and have failed to effectively provide for indirect ventilation in the winter and for ventilation in the summer while it is raining.

It is a general object of the present invention to provide an improved window of the convertible type which provides for an instant change from a storm window to a screen without manipulating any fastenings, which provides for an effective no-draft ventilation in the winter, for ventilation in the summer without danger of rain entering the room, and can be inexpensively manufactured with wooden frames.

Other objects of the invention are to provide a window as above described which can be employed in a manner to eliminate the entrance of dust and dirt while ventilating; a window which has a light-weight, easily handled, convertible insert that can be withdrawn from the inside of a room and can be stored in a relatively small space; a window having inserts which fit in a weather-tight and water-proof manner; a window which includes a novel, easily manipulatable plunger type of fastener for securing the main sash to the building, rendering the construction relatively burglar-proof and improving the exterior appearance; and a window which is so constructed as to make it possible to wash the outside of the storm glass without removing the main sash and without utilizing a ladder.

A more specific object of the invention is to provide a window comprising a main sash and a removable insert, said insert being capable of being instantly removed either partially for ventilation or completely for a seasonal change, by merely lifting upwardly a short distance and by pulling downwardly and inwardly on the lower edge, the upper portion of the insert being cooperable with yielding depending clips which perform the dual function of holding the insert in ventilating position and of guiding the insert into proper closing fit when it is being re-placed.

With the above and other objects in view, the invention consists of the improved window and

all its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawing illustrating one complete embodiment of the preferred form of the invention in which the same reference numerals designate the same parts in all of the views:

Fig. 1 is a vertical, longitudinal sectional view through the window casing of a building illustrating the usual upper and lower sashes of the inner window and the improved outside auxiliary window;

Fig. 2 is a similar view of the lower portion only showing the insert in winter ventilation position and showing the lower sash of the inner window raised to provide for no-draft ventilation;

Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 1;

Fig. 4 is a fragmentary view taken at the location indicated by the numerals 4—4 of Fig. 1;

Fig. 5 is an elevational view on a smaller scale, of the outside of the window showing the insert in the ventilating position of Fig. 2;

Fig. 6 is an elevational view of the improved window removed with the interchangeable screen and storm inserts positioned thereadjacent;

Fig. 7 is a fragmentary sectional view taken longitudinally through a portion of one of the stiles of the improved window showing the method of removably locking the stile to the side of the window casing; and

Fig. 8 is a similar view showing the locking plunger in released position.

Referring more particularly to the drawing, numeral 10 designates the window casing of a building, and movable within said casing in the usual manner is the customary slidable lower sash 11, and slidable upper sash 12. The improved convertible outside window forming the subject matter of the present invention comprises a lower rail 13 and upper rail 14, stiles 15 and 16, and a transverse rail dividing the window into upper and lower sections. The upper section is preferably fitted with a permanent, non-removable piece of glass 18, and the upper rail 14 is equipped with hangers 19 of any desired form for cooperation with hooks 20 to swingably support the upper portion of the window on the building.

Extending through the stiles 15 and 16 adjacent the lower section of the auxiliary window in the manner shown in Figs. 7 and 8 are tubular guides 21, each having a spiral slot 22 extending partially therearound, the tubular guides 21 have rough-

ened exterior surfaces and are driven into bores 23 of the stiles to be permanently and non-removably positioned therein. Movably located within each guiding tube 21 is a locking plunger 24, having a pin 25 projecting a short distance at an intermedial portion of its length, said pin being cooperable with the spiral slot 22 of the guide tube 21. The inner end of the plunger 24 is cooperable with an opening 26 in the side of the window casing, and said opening is preferably lined with a metal tube 27 driven therein. The outer end of the plunger 24 is equipped with suitable means for the reception of a turning tool, such as the screwdriver slot 28. When the pin 25 of the plunger is in the position of Fig. 8 at one end of the spiral slot 22, it is disengaged from the window casing. To lock the stile to the casing it is merely necessary to press the outer end of the plunger with the finger and it will then move to the locking position of Fig. 7 with an inward turning motion caused by the engagement of the pin with the slot, Fig. 7 showing the pin 25 stopped by the inner end of the spiral slot. This provides a flush lock which in no way interferes with the positioning of the window insert to be hereinafter described. Furthermore, there are no exterior fastenings, as is common with storm windows or screens. To disengage the plungers it is merely necessary to insert a screwdriver in the slot 28 and a quick twist to the left will cause withdrawal of the plunger back to the position of Fig. 8. It is preferred to employ four of the locking plungers 24 and associated guiding tubes at the points indicated in Fig. 5.

Removably cooperable with the opening in the lower section of the improved window is an interchangeable screen insert 29, and a storm insert 30 (see Fig. 6), and inasmuch as the fit of the frame of each insert in the opening of the window is the same, a single description will suffice.

Each insert has upper and lower frame portions 31 and 32, and side frame portions 33 and 34, the side frame portions 33 and 34 having projecting flanges 35 and 36 (see Figs. 3 and 4), which fit against and overlap the inner surfaces of the stiles of the main frame. The upper frame part 31 of each insert has a similar flange projection 37 which, however is spaced inwardly from an upwardly extending tongue 38 of less length than the flange 37 (see Figs. 1 and 2), there being a groove 39 formed between the flange 37 and the tongue 38. The tongue 38 is adapted to cooperate with a groove 40 formed in the lower edge of the transverse rail of the main frame, and a tongue 41 projecting from said lower edge of the transverse rail is adapted to cooperate with the groove 39 of the upper frame part 31 of the insert.

The lower frame part 32 of the insert is formed with a depending flange 42 and with a tongue 43 spaced outwardly from said flange to define a groove 45 therebetween. The groove 45 is cooperable with an upwardly projecting tongue 44 on the upper edge of the lower rail of the main frame.

When the insert is in position within the main frame, as shown in Fig. 1, the upper and lower tongues and grooves are in engagement, and the side flanges 35 and 36 are pressed snugly in overlapping position, providing a weather-tight and water-proof seal. It is to be noted, however, that the upper edge of the tongue 38 at the top of the insert terminates short of the groove 40 leaving a space for upward movement. It is also to be

noted that the bottom of the tongue 41 terminates short of the bottom of the groove 39. Thus when the handles 46 at the bottom of the insert are grasped, the insert may be slid upwardly a sufficient distance to disengage the tongue and groove 44, 45 at the bottom, whereby the lower portion of the insert may then be pulled inwardly and downwardly to the ventilating position of Fig. 2, or it may be withdrawn entirely for a seasonal change.

Spring clips 47 having curved or curled lower ends 48 are secured to the inner surface of the intermediate rail of the storm window, as at 49, and depend downwardly therefrom. These spring clips are of sufficient length to still engage the upper portion of the insert when the latter is in the ventilating position of Fig. 2. Thus the insert will be held securely in ventilating position against wind action or accidental displacement. These spring clips not only serve the above function but also maintain the upper portion of the insert between the stiles of the main window and yieldingly urge the upper portion of the insert outwardly so that when the insert is raised upwardly from ventilating position the spring clips urge the upper tongues and grooves into engagement, and no care on the part of the operator is required. The curled lower ends of the clips project inwardly a sufficient distance to be rubbed by the lower rail of the upper sash of the inner window, whereby the latter may be partially lowered to press the clips more tightly against the insert when the latter is in the ventilating position of Fig. 2. The spring clips also make it a simple matter to replace the insert after a seasonal change, because it is merely necessary to hold the insert at an angle against the main frame with the upper portion of the insert between the stiles of the main frame. By then pushing upwardly, the upper portion of the insert will slide beneath the curved lower ends of the spring clips and the spring clips will then function to insure cooperation of the upper tongues and grooves.

From the above it is apparent that the storm insert 30 can be easily replaced by the screen insert 29 in the spring, and that the latter can be easily replaced by the storm insert 30 in the fall. Inasmuch as these inserts are less than half the size and weight of a complete storm window or complete screen, they are light to handle and can be stored in a relatively small space. It is also apparent that the seasonal change can be done entirely from the inside of the building, eliminating the necessity of using ladders, and this change can be effected in a few minutes without manipulating any fastenings, it being unnecessary to remove the main frame because the upper section of glass 18 is used in both winter and summer.

In the wintertime when it is desired to ventilate, the storm insert can be dropped down to the ventilating position, shown in Fig. 2, whereby the majority of air will enter above the upper edge of the insert, as indicated in Figs. 2 and 5. A small amount of air will also enter at the sides of the insert, as indicated in Fig. 5. Then by raising the lower sash of the inner window, as shown in Fig. 2, an indirect ventilation is provided. It is also possible to obtain indirect ventilation by lowering the upper sash of the inner window. In either case direct draft is eliminated and entry of dirt, dust, or snow into the room is retarded. This method of ventilation is very advantageous as compared to the usual flap shutter controlling a porthole in the lower rail

of the ordinary storm window because this provides a direct draft when the lower sash of the inner window is opened.

In the summertime when the screen insert 29 is being used, the upper sash of the inner window may be lowered for ventilation, leaving the lower portion of the inner window closed. Thus air can enter through the lower screen section and pass upwardly over the top of the upper sash of the inner window. Due to the fact that the glass 18 of the storm sash remains in place in the summer, it is possible to ventilate in the manner above described without danger of rain entering the room.

The improved construction is also advantageous for window washing because the lower insert may be removed easily and washed inside of the room, and while removed a person may lean out through the lower opening and reach up to wash the outside of the glass 18. On an ordinary storm window this is not at all possible.

The improved window with its two inserts can be manufactured for approximately the same cost as a storm window and a screen. However, in view of the fact that there is only one frame to fit when the improved windows are being installed in a home, the net cost to the user is less than if he had separate storms and screens.

Should it be desired to remove the entire auxiliary window from the building, for painting or for washing of the outside of the inner windows, this can be easily done by removing the insert and then by withdrawing all of the plungers 24 to the position of Fig. 8. The main frame can then be swung outwardly and removed from the upper hanger hooks 20.

It is obvious that the tongue and groove engagement of the insert may be reversed within the range of mechanical skill and that other changes and modifications may be made without departing from the spirit of the invention, and all of such changes are contemplated as may come within the scope of the claims.

What I claim is:

1. In a window construction, a main frame having an opening defined by stiles and by upper and lower rails, an insert removably positionable between said stiles and rails, said insert having sides which are insertable between the stiles by outward pressure from the inner side of the frame, and yielding clip means depending from the upper cooperating rail of the main frame and exerting an outward pressure on the insert to guide the upper edge thereof into cooperating engagement with the upper cooperating rail of the main frame, said yielding

clip means being of such length as to engage the upper portion of the insert when the latter is partially removed and lowered with its lower edge resting on the window sill, whereby the clip means maintains the insert in ventilating position.

2. In a window construction, a main frame having an opening defined by stiles and by upper and lower rails, an insert removably positionable between said stiles and rails, said insert having sides which are insertable between the stiles by outward pressure from the inner side of the frame, means for limiting the outward movement of the insert when said outward pressure is exerted, means for supporting the lower edge of the insert when the insert has been partially lowered to inclined position by inward withdrawal of the lower portion and downward movement thereof, and yielding clip means on the inner side of the main frame positioned to engage the upper part of the insert, said clip means being of sufficient length to engage said upper part of the insert after the insert has been partially lowered and to exert outward pressure thereon to maintain said upper portion between the stiles, whereby air may enter above the upper edge of the insert.

3. In a window construction, a casing, a lower inner sash movable in said casing, an upper inner sash movable in said casing and having a bottom rail, a main storm frame having an opening defined by stiles and by upper and lower rails, an insert removably positionable between said stiles and rails, said insert having sides which are insertable between the stiles by outward pressure from the inner side of the frame, means for limiting the outward movement of the insert when said outward pressure is exerted, means for supporting the lower edge of the insert when the insert has been partially lowered to inclined position by inward withdrawal of the lower portion and downward movement thereof, and yielding clip means on the inner side of the storm frame positioned to engage the upper part of the insert, said clip means being of sufficient length to engage said upper part of the insert after the insert has been partially lowered and to exert outward pressure thereon to maintain said upper part between the stiles whereby air may enter above the upper edge of the insert, said clip means having an inward projection which is frictionally engaged by the lower rail of the upper inner sash when the latter is lowered to press the clip means against the insert when the latter is in partially lowered ventilating position.

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