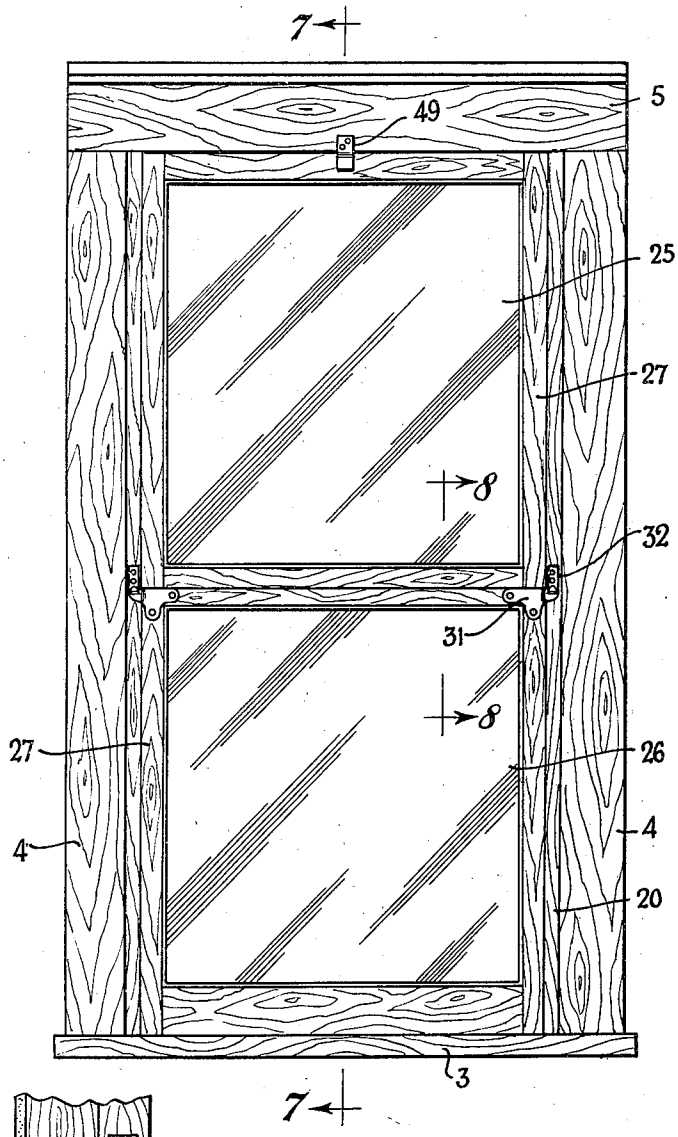
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STORM WINDOW

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Fig. 1.



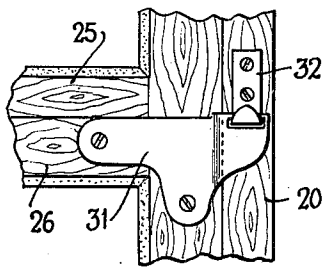


Fig. 6.

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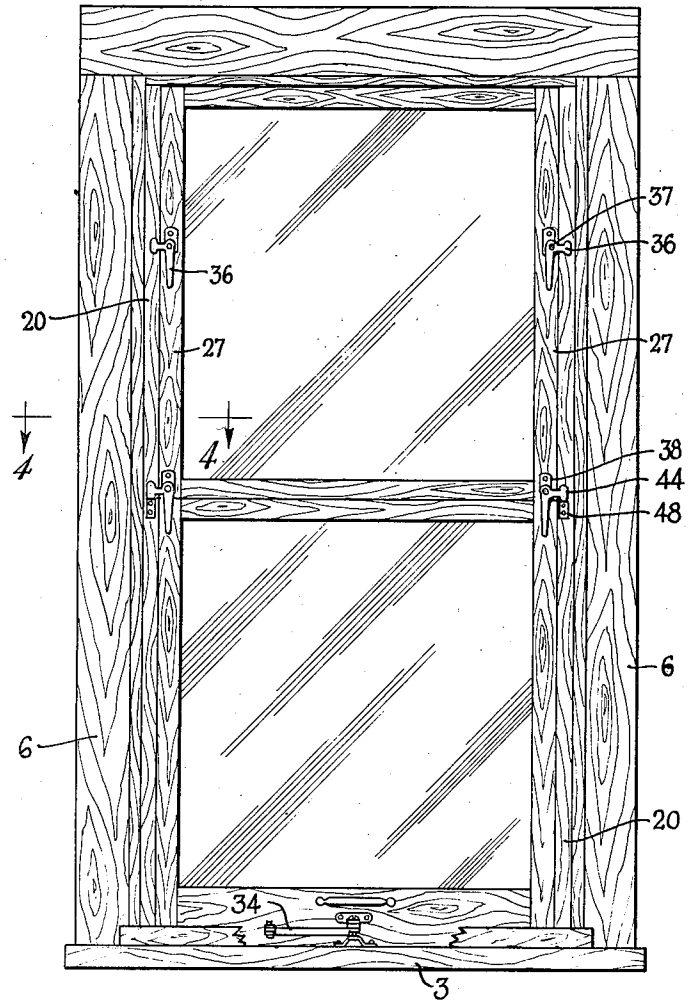
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STORM WINDOW

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Fig. 2.



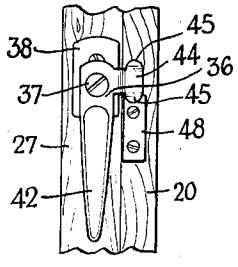


Fig. 5.

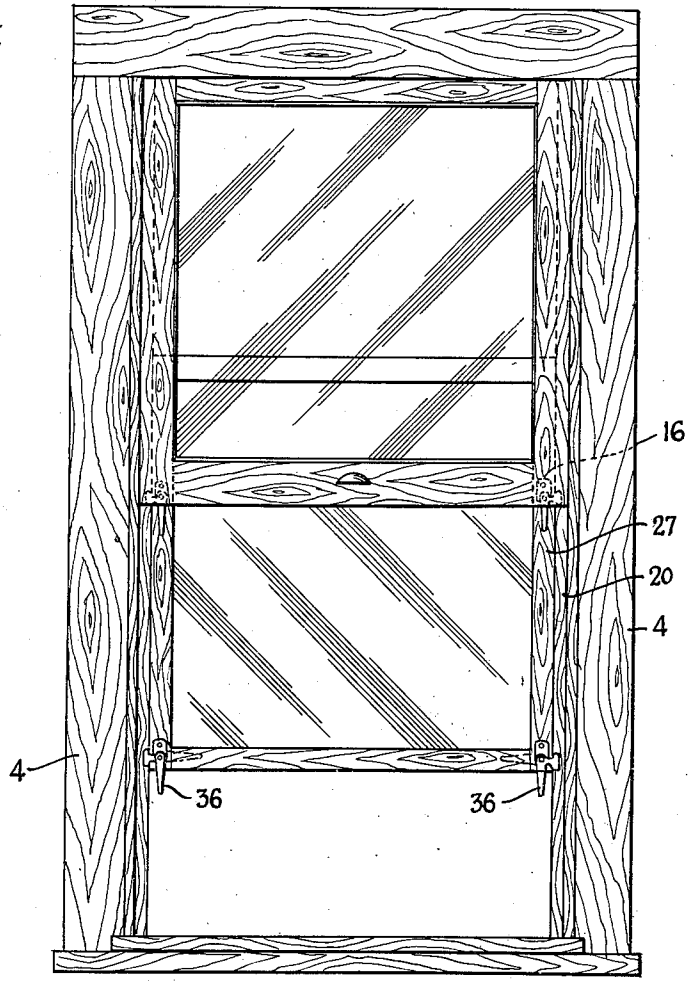
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STORM WINDOW

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Fig. 3.



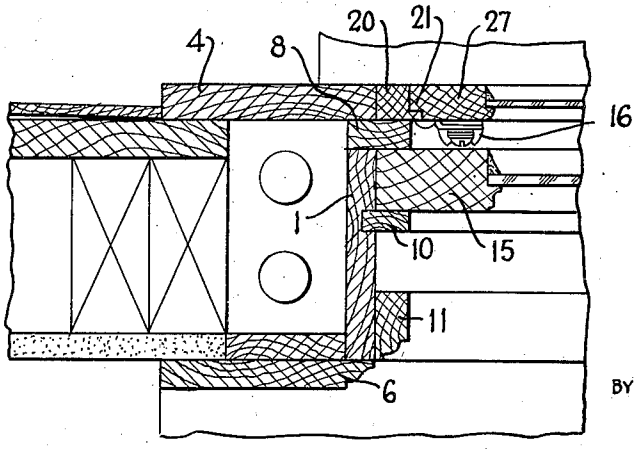


Fig. 4.

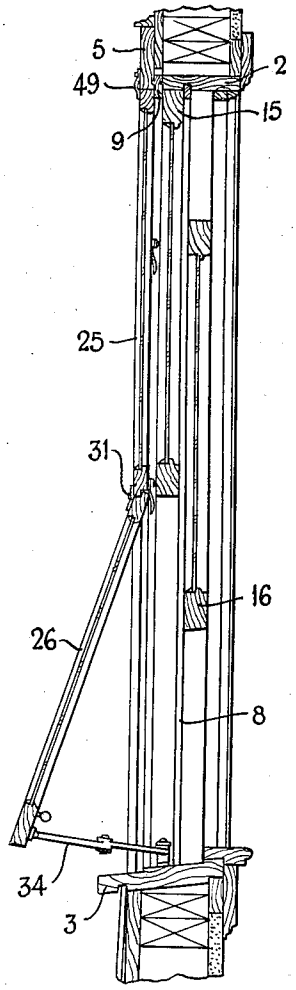
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STORM WINDOW

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Fig. 7.



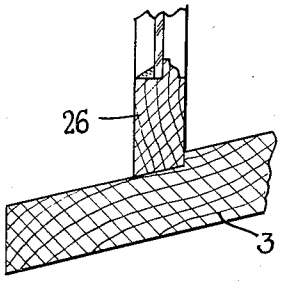


Fig. 9.

Fig. 8.

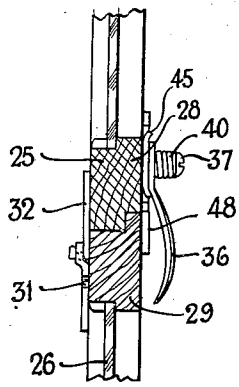


Fig. 11.

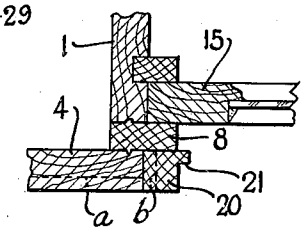
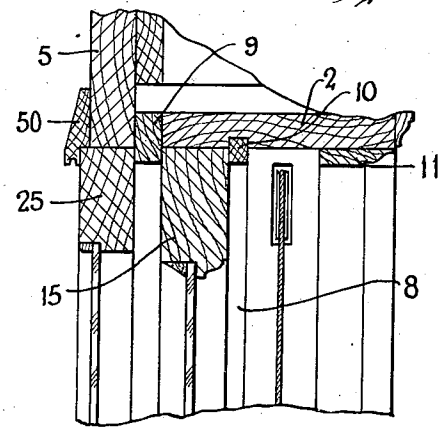


Fig. 10.



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UNITED STATES PATENT OFFICE

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STORM WINDOW

Virgil F. Espenschied, Hartville, Ohio, assignor to The F. E. Schumacher Company, Hartville, Ohio, a corporation of Ohio

Application March 15, 1945, Serial No. 582,932

17 Claims. (Cl. 20—55)

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The present invention relates to improvements in storm windows of the type which is designed to fit in any of the standard window frames.

It is the object of the present invention to improve upon existing designs of storm windows in order to eliminate the objectionable features found therein. The storm window illustrated and described herein is designed to facilitate easy and simple installation and removal. One of the primary objections to the installation of modern storm windows is that skilled carpenters have to be employed at substantial expense. The storm window illustrated herein may be installed by any householder for it is designed so that it can be fitted to any window frame of standard construction by merely nailing two strips along the frame opening and attaching a standard hardware fixture.

In many previous designs it is necessary, in order to install or remove the storm window to lower the upper window sash which is objectionable because of the presence of drapes or Venetian blinds. It is also an objection to earlier forms of storm windows that they have to be installed from the outside. The improved design disclosed herein obviates both of these objections for the entire storm window may be installed from the interior of the house without disturbing the upper sash.

It is also a purpose of the design shown herein —to make the installation with little change or alteration of the original window frame. It requires only the permanent addition of two small strips or rails along the vertical casing in order to provide for the installation of the storm window. These rails do not restrict the window opening and are permanently installed without materially affecting the appearance of the window.

A further advantage of the improved design is that there is no horizontal strip or batten along the sill as in former storm windows. This prevents the entrapment of the dirt which is usually collected behind the lower horizontal batten and the housewife may clean the sill by brushing the dirt out of the window. This result is achieved in conjunction with an improved method of ventilation as the lower storm sash fits against the sill and may be swung outwardly for ventilation or for removing the dirt which may have accumulated behind it.

It is a further advantage that the storm window is so arranged as to be more air- and storm-proof than previous windows of this general type. In the design shown herein the force of the wind against the storm sash serves merely to seal the joints more tightly.

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Another advantage is that the improved storm window is readily adapted to the numerous codes or customs which are in effect throughout the United States. There are many standards for the wood in window frames which are designated in the trade by the local market areas and the manufacture of storm sashes which may be sold over the entire country has been greatly hampered by these arbitrary codes. The storm window shown herein is particularly designed so that with a slight variation in the vertical strips or rails referred to, a standard set of storm sashes may be readily adapted to any window frame. This is a very substantial advantage of the present invention as it eliminates the necessity for carrying a complete line of storm windows in order to supply a nation-wide demand.

In the drawings and specification the improved storm window is shown as adapted to a standard window frame for a frame house construction, but the invention is equally adaptable to all standard types of wooden window frames. With suitable changes such as would be apparent to those skilled in the art it may also be adapted to metal sash constructions. While a wooden storm window and attachments are shown as the preferred form of the invention, the improved storm window may be made of metal parts.

It will be understood that the lower storm sash or both storm sashes may be replaced with screens for summer. It will also be understood that other changes and modifications may be adopted without in any way sacrificing the benefits of the invention and that the claims are intended to be of sufficient scope to cover mechanical variations and even improvements in the invention as defined therein.

In the drawings which illustrate the invention in its best known form adapted to a standard window frame:

Fig. 1 is an elevation of the improved storm window looking from the outside;

Fig. 2 is an elevation from the inside of the house, this view being taken with the regular window sashes removed;

Fig. 3 is a view similar to Fig. 2 but showing both window sashes raised and the upper storm sash partly moved to its proper position;

Fig. 4 is a cross section on the line 4—4 of Fig. 2;

Fig. 5 is an enlarged fragmentary view of one of the swinging clamps on the upper storm sash;

Fig. 6 is an enlarged fragmentary view of one

of the swinging supports for the lower storm cash;

Fig. 7 is a vertical section on the line 7—7 of Fig. 1 showing the lower storm sash opened for ventilation;

Fig. 8 is an enlarged section on the line 8—8 of Fig. 1;

Fig. 9 is a detail view at the sill, showing the lower storm sash in closed position;

Fig 10 is a modification showing a form of drip cap used with a thinner head casing; and

Fig. 11 is a view showing the manner in which the improved storm window is readily adapted to wide or narrow frame openings.

As the improved storm sash is adapted to and in certain aspects of the invention cooperates with and is in combination with the window framing, it is necessary to describe the standard window frame which has been selected for illustrating the invention.

The window frame shown herein comprises the two vertical or side jambs 1, the upper or head jamb 2, and the sill 3. There are also the outer side casings 4, the head casing 5, and the inner casings 6. Between the outer casings and the jambs are located the strips which are designated in the trade as "blind stops." The vertical blind stops are indicated by the numeral 8 and the upper blind stop by the numeral 9. It will be noted that these blind stops project beyond the inner edges of the casings and thereby form angular recesses at sides and at the top of the window frame. This recessed formation is utilized in the improved storm sash as will become apparent. Seated in the vertical jambs are the parting strips 10 and on the inside of the frame are the moldings 11 which with the blind stops form the channels in which slide the upper window sash 15 and the lower window sash 16.

Vertical strips or rails 20 are seated in the angular recesses formed by the side casings 4 and the vertical blind stops 8. The outer exposed edge of each rail 20 is provided with a rabbet or channel 21 to receive flanges on the storm sashes to be described. It will be noted that these channels face outwardly for reasons to be stated. These rails are usually made of a thickness to correspond with the thickness of a standard casing so that the surfaces of the rails and the casings are flush. If the casing 4 is of somewhat thinner construction, as indicated by the dotted line *a* in Fig. 11, the installation is not affected in any way. It often happens that the outer casings 4 vary in width and may extend, for example, to the doted line *b* in Fig. 11. In such case the strips 20 are made somewhat narrower than is shown in full lines so as to compensate for the reduced distance between the casings without changing the effective location of the channels 21. It is possible therefore, with the storm window of the invention, to utilize the same storm sashes with a great variety of window frames, it being necessary merely to provide rails of appropriate widths for all types of standard frame construction.

The storm window shown herein consists of an upper and lower sash 25 and 26 respectively. Each storm sash has vertical side members 27, each of which is provided with a rabbeted edge or flange to fit within the channel 21 in the rail 20. It will be noted that the storm sashes overlap the rails so the line of contact between each rail 20 and its sash faces outwardly of the window and therefore the force of the wind against

the side of the storm window will tend to close the crack between the storm sash and the rail. This is a substantial improvement over previous storm sashes in which the force of the wind tends to open the cracks around the storm sashes. As shown in Fig. 7, this arrangement makes it possible to swing the lower sash outwardly for ventilation. In most storm windows the ventilation is secured by swinging the lower sash inwardly and the extent of ventilation opening is restricted by the position of the lower window sash. In the improved construction the lower storm sash may be set to the maximum ventilation opening and the actual ventilation controlled by the extent to which the lower sash 16 is raised.

The lower edge of the upper storm sash is designated as 28 and the upper edge of the lower storm sash by the numeral 29, these two members having mating rabbeted edges as shown in Fig. 8, facing so that the lower storm sash may be swung outwardly as described and the crack between the sashes is closed when the lower sash is closed. To support the lower sash 26 for this swinging movement, brackets 31 are secured to the upper corners of the lower sash and extend over the rails 20, being offset slightly at this point. Hook-shaped clips 32 are fastened on the side rails 20 and the brackets are slotted to permit the lower sash to be hung in position. It will be observed that the center or axis of the outward swinging movement of the lower sash is in substantial alignment with the lower edge of the sash 25. Any suitable type of commercial hardware such as the fixture 34 may be employed to hold the lower storm sash at the desired angle or to lock it in closed position. It will be noted that the lower edge of the lower storm sash fits against the sill 3 and therefore any dirt which may collect on the sill behind the lower sash may be brushed out when the lower storm sash is swung outwardly. The fixture 34 should be of the type which can be readily disconnected for installing and removing the storm window.

Referring now to the upper storm sash: At spaced points along each side member 27 of the sash are two (or more) clamping levers designated by the numeral 36. Each clamp or lever 36 is pivoted on the pin 37 mounted on a plate 38 attached to the member 27. A coil spring 40 surrounds the pin 37 and forces the lever yieldingly against the side of the storm sash. On one side of the pivot the lever is provided with an operating handle 42 and at right angles thereto is the bearing arm 44, the end of which is preferably broadened somewhat and provided with the two ears or lugs 45 which are turned upwardly slightly. On the inside of the rails 20 in position to be engaged by the lower pair of levers 36 when the upper sash is in its raised position, are two plates 48. These plates serve to retain the upper sash in its position in the window frame while the lower sash is being inserted and in case the lower sash is opened.

To install the storm window the operator works entirely from the inside of the house which simplifies the operation and makes it possible for the housewife to complete the entire installation and removal. The lower window sash is raised and the levers 36 on the upper storm sash are turned to the inactive or release position shown in dotted lines in Fig. 3. The upper storm sash is then inserted through the window opening and drawn back against the rails 20 with the rabbeted edges

in engagement. The levers 36 are then turned to active or full line position so that the upper storm sash is in sliding relation to the rails 20. The upper storm sash is then raised until it reaches the top of the frame against the head casing 5. It is desirable to provide a keeper for the upper edge of the sash 15 and for this purpose a clip 49 is attached to the casing 5 and projects over the edge of the sash. When the casing is not as thick as the storm sash it is desirable to provide a sealing means along the lower edge of the casing 5 and this is shown in Fig. 10 as a rabbeted molding or drip cap 50 which extends along the casing and overalps the upper storm sash 15.

As the sash 15 is raised in the manner described, the levers will yield slightly as they pass over the plates 48. The spring pressure exerted through the levers and on to the rails 20 serves to hold the upper storm sash tightly seated against the rails. The lower storm sash is now passed through the window opening and the brackets 31 engaged over the hooks 32, the sash swung inwardly and the fixture 34 properly engaged. The installation is now completed. To remove the storm window in the spring the lower sash 16 only may be taken out and replaced with a screen sash, but if both sashes are to be removed, the upper sash is lowered to the level of the window opening, the levers 36 swung to release position and the sash removed. The levers 36 make an excellent gripping means for manipulating the upper storm sash. It will be noted from the description of the operations that the upper window sash need not be moved in order to install or remove the storm window. It will also be observed that the rails 20 are the only items which are retained in the window frame.

While the disclosure made hereby is very full and complete, all of the details thereof are not essential and may be varied or altered without in any way impairing the invention.

What is claimed is:

1. A storm window installation comprising the combination of a window frame having outer vertical casings and blind stops located inwardly thereof and providing a recessed channel along the vertical edges of the frame, a vertical strip permanently secured in each vertical channel, said strip also being provided with a recessed channel facing outwardly of the window, an upper storm sash the edges of which are seated in the channels in the strips, and movable clamps carried on the inside of the storm sash, said clamps having portions which project beyond the sash and have sliding contact with the rails when the clamps are in one position and free the rails when the clamps are in another position to permit removal of the sash.

2. A storm window installation comprising the combination of a window frame having outer vertical casings and blind stops located inwardly thereof and providing a recessed channel along the vertical edges of the frame, a vertical strip permanently secured in each vertical channel, said strip also being provided with a recessed channel facing outwardly of the window, an upper storm sash the edges of which are seated in the channels in the strips, movable clamps carried on the inside of the storm sash, said clamps having portions which project beyond the sash and have sliding contact with the rails in one position or to free the rails to permit the removal of the sash when in another position, and reisilent mountings for the clamps which serve to draw the sash against the rail.

3. A storm window installation comprising the combination of a window frame, rails attached to the vertical portions of the frame, each said rail being formed with a recessed channel opening outwardly of the window, a storm sash, the edges of which have a sliding fit in said channels, and movable clamps mounted on the inside surface of the storm sash, said clamps being adapted in one position to hold the sash in sliding relation to the rails and in the other position to release the sash from the rails.

4. A storm window installation comprising the combination of a window frame, rails attached to the vertical portions of the frame, each said rail being formed with a recessed channel, a storm sash, the edges of which have a sliding fit in said channels, and movable clamps mounted on the storm sash, said clamps having portions adapted in one position to project beyond the sash and over the rail to hold the sash in sliding relation to the rails and in the other position to free the rail and release the sash from the rails.

5. A storm window installation comprising the combination of a window frame, rails attached to the vertical portions of the frame, each said rail being formed with a recessed channel opening outwardly of the window, a storm sash, the edges of which have a sliding fit in said channels, movable clamps mounted on the inside surface of the storm sash, said clamps being adapted in one position to hold the sash in sliding relation to the rails and in the other position to release the sash from the rails, and resilient means associated with said clamps to hold the sash against the rail.

6. A storm window installation comprising the combination of a window frame, rails attached to the vertical portions of the frame, each said rail being formed with a recessed channel, a storm sash, the edges of which have a sliding fit in said channels, movable clamps mounted on the storm sash, said clamps having portions adapted in one position to project laterally beyond the sash and hold the sash in sliding relation to the rails and in the other position to release the sash from the rails, and spring means associated with said clamps to hold the sash against the rails.

7. In a storm window installation the combination of a window frame comprising vertical side casings and a sill, vertical rails attached to the side casings, said rails having channels rabbeted in the outer edges thereof, upper and lower storm sashes, the edges of the upper storm sash having a sliding engagement with the said channels, the lower storm sash having edges which fit in said channels, means to support the lower storm sash for outward swinging movement on a horizontal axis adjacent the lower edge of the upper sash, and overlapping rabbeted edges along the mating edges of the upper and lower sashes.

8. In a storm window installation the combination of a window frame comprising vertical side casings and a sill, vertical rails attached to the side casings, said rails having channels rabbeted in the outer edges thereof, upper and lower storm sashes, the edges of the upper storm sash having a sliding engagement with the said channels, the lower storm sash having edges which fit in said channels, means to support the lower storm sash for outward swinging movement on a horizontal axis adjacent the lower edge of the upper sash, and overlapping rabbeted edges along the mating edges of the upper and lower sashes,

the lower edge of the lower sash fitting against the sill when the lower sash is closed.

9. In a storm window installation the combination of a window frame comprising vertical side casings and a sill, vertical rails attached to the side casings, said rails having channels rabbeted in the outer edges thereof, upper and lower storm sashes, the edges of the upper storm sash having a sliding engagement with the said channels, movable clamps adapted to hold the upper storm sash on the rails, spring means associated with the clamps and acting to draw the upper sash in close fitting engagement with the rails, the lower storm sash having edges which fit in said channels, means to support the lower storm sash for outward swinging movement on a horizontal axis, and overlapping rabbeted edges along the mating edges of the upper and lower sashes.

10. In a storm window installation the combination of a window frame comprising vertical side casings and a sill, vertical rails attached to the side casings, said rails having channels rabbeted in the outer edges thereof, upper and lower storm sashes, the edges of the upper storm sash having a sliding engagement with the said channels, movable clamps adapted to hold the upper storm sash on the rails, spring means associated with the clamps and acting to draw the upper sash in close fitting engagement with the rails, the lower storm sash having edges which fit in said channels, means to support the lower storm sash for outward swinging movement on a horizontal axis, and overlapping rabbeted edges along the mating edges of the upper and lower sashes, the lower edge of the lower sash fitting against the sill when the lower sash is closed.

11. A storm window comprising a window frame, vertical rabbeted rails secured along the inner vertical edges of the frame, an upper storm sash having a sliding engagement with the rails, a lower storm sash mounted for swinging movement outwardly of the window frame, both said sashes overlapping the outer surface of the rabbeted portions of said rails, and means to draw both said sashes inwardly toward the rails.

12. A storm window comprising a window frame, vertical rabbeted rails secured along the inner vertical edges of the frame, an upper storm sash having a sliding engagement with the rail, a lower storm sash mounted for swinging movement outwardly of the window frame, both said sashes overlapping the outer surface of the rabbeted portions of said rails, and movable clamps located on the inner surface of the upper sash and movable over the inner surface of the rails to hold the upper sash in sliding relation therewith.

13. A storm window comprising a window frame, vertical rabbeted rails secured along the inner vertical edges of the frame, an upper storm sash having a sliding engagement with the rail, a lower storm sash mounted for swinging movement outwardly of the window frame, both said sashes overlapping the outer surface of the rabbeted portions of said rails, movable clamps located on the inner surface of the upper sash and movable over the inner surface of the rails to hold the upper sash in sliding relation therewith, and resilient means associated with each clamp and adapted to draw the upper sash against the rail.

14. A storm window comprising the combination with a window frame of vertical rails secured to the vertical inside edges of the frame, each rail having a channel, a storm sash having vertical edges in sliding and mating fit with the rail channels, and pivoted levers on the sash, said levers having arms movable over the rails to hold the sash in sliding engagement with the rails or to release it therefrom.

15. A storm window comprising the combination with a window frame of vertical rails secured to the vertical inside edges of the frame, each rail having a channel, a storm sash having vertical edges in sliding and mating fit with the rail channels, pivoted levers on the sash, said levers having arms movable over the rails to hold the sash in sliding engagement with the rails or to release it therefrom, and a yielding mounting for said levers, said mountings serving to draw the sash in close contact with the rails.

16. A storm window comprising the combination with a window frame of vertical rails secured to the vertical inside edges of the frame, each rail having a channel, a storm sash having vertical edges in sliding and mating fit with the rail channels, pivoted levers on the sash, said levers having arms movable over the rails to hold the sash in sliding engagement with the rails or to release it therefrom, and a second storm sash to complete the storm window, said second sash having a pivotal support whereby it may be swung outwardly of the frame.

17. A storm window comprising the combination with a window frame of vertical rails secured to the vertical inside edges of the frame, each rail having a channel, a storm sash having vertical edges in sliding and mating fit with the rail channels, pivoted levers on the sash, said levers having arms movable over the rails to hold the sash in sliding engagement with the rails or to release it therefrom, a spring mounting for said levers, said spring mountings serving to draw the sash in close contact with the rails, and a second storm sash to complete the storm window, said second sash having a pivotal support whereby it may be swung outwardly of the frame.

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