March 17, 1953 R. R. BUCKWALTER 2,631,698

STORM SHUTTER

Filed Oct. 22, 1949 2 SHEETS—SHEET 1

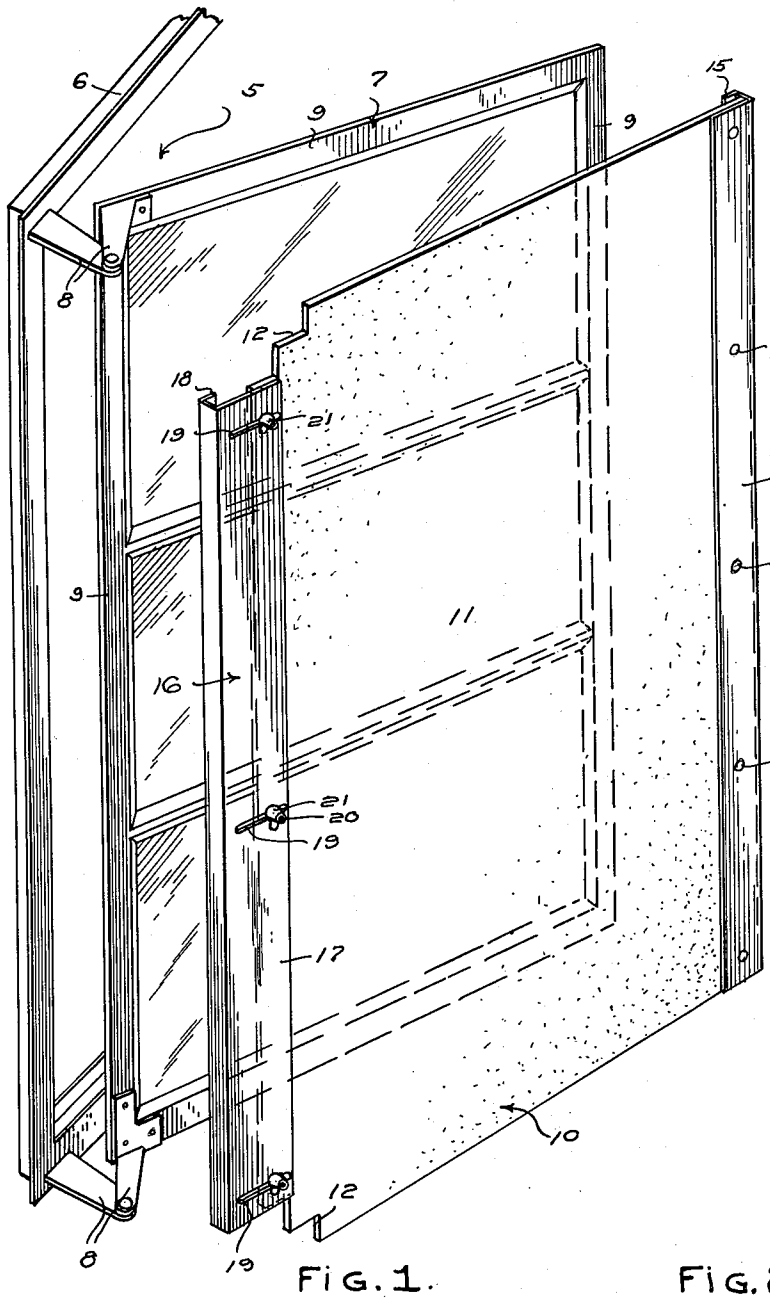


FIG. 1.

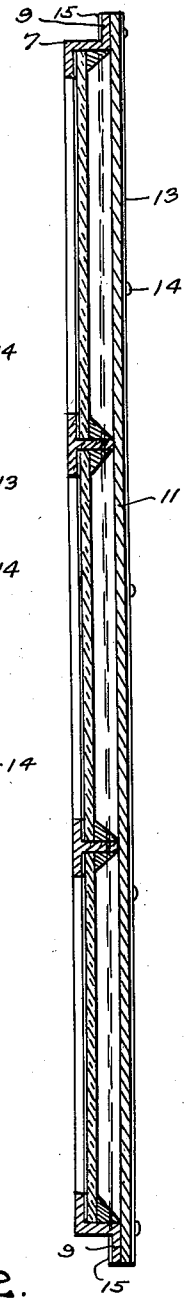


FIG. 2.

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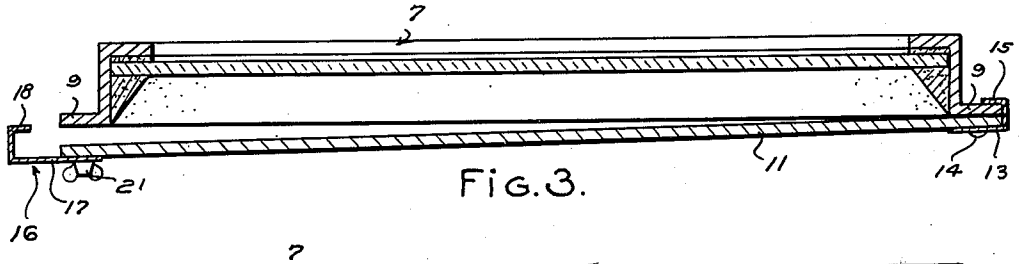


Fig. 3.

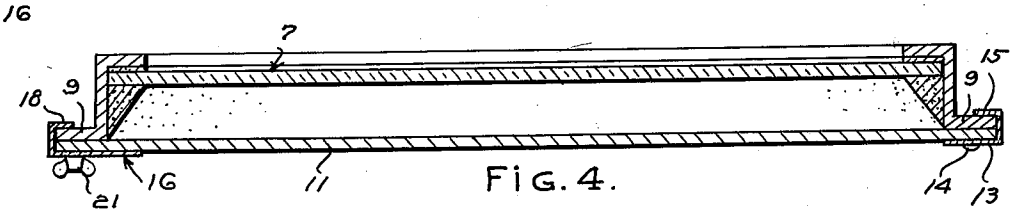


Fig. 4.

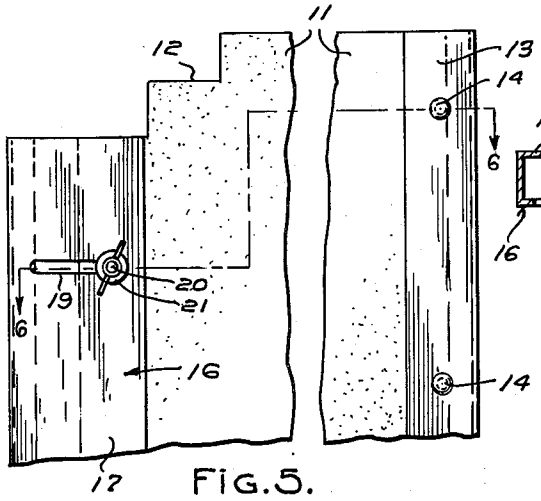


Fig. 5.

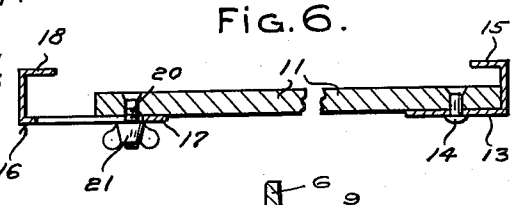


Fig. 6.

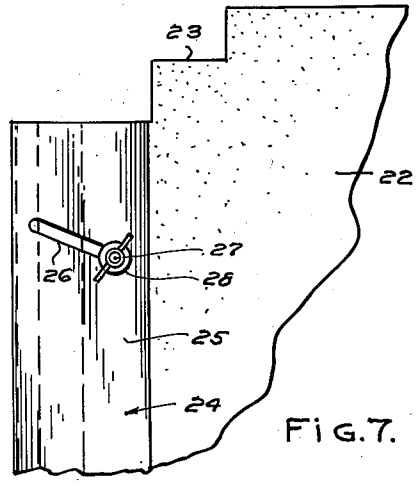


Fig. 7.

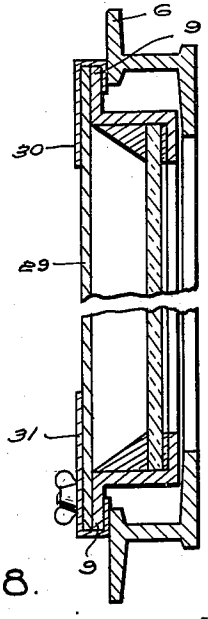


Fig. 8.

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UNITED STATES PATENT OFFICE

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STORM SHUTTER

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Application October 22, 1949, Serial No. 122,926

1 Claim. (Cl. 189—69)

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This invention relates to improvements in storm shutters and has particular reference to storm shutters for use with casement and awning type windows of metal construction.

It is an object of the present invention to provide a storm shutter that may be quickly and easily attached to the conventional casement window without the use of tools or other fastening devices and which, when mounted, will remain rigidly in place against displacement by winds or other external or internal forces.

An important object of the invention resides in a storm shutter constructed in a manner to engage and grip the flanged edges of a window in a novel manner and which will permit the normal operation of the window with the shutter attached.

A further and very important object of the invention resides in storm shutters having the above named characteristics, that are interchangeable with windows of corresponding sizes, thus avoiding the necessity of accurately fitting each shutter to its particular window and identifying such shutters for future use. The well known casement windows frequently vary in size a fraction of an inch and shutters heretofore employed must of necessity be accurately fitted to its particular window. With the shutter of the present invention, the construction is such as to make it adjustable automatically to windows of a particular stock number.

Another object of the invention resides in the extreme simplicity of the device, which has no parts likely to become disarranged, is exceptionally strong, durable, cheap to manufacture and highly efficient, requires no drilling or tapping of the window and in no way defaces the window.

Other important objects and advantages of the invention will be readily apparent during the course of the following description, reference being had to the accompanying drawings.

In the drawings, wherein like characters of reference denote like parts throughout:

Figure 1 is a perspective view illustrating a casement window and a storm shutter embodying the invention,

Figure 2 is a vertical sectional view of a casement sash with the shutter in mounted position,

Figure 3 is a horizontal sectional view through a casement sash with the shutter in the act of being mounted,

Figure 4 is a similar view with the shutter in fully mounted position,

Figure 5 is an enlarged fragmentary front elevation of the upper end of the shutter.

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Figure 6 is a horizontal section taken on line 6—6 of Figure 5,

Figure 7 is a fragmentary front elevation of a modified form of shutter and,

Figure 8 is a vertical section taken through a casement sash and illustrating an alternate method of mounting the shutter.

Referring specifically to the drawings, the numeral 5 designates a conventional window, having a frame 6 and a hinged sash 7. The window is of any usual metal construction, such as the steel or aluminum casement type and the sash 7 is swingably connected to the frame 6 by hinge elements 8. The sash embodies the well known flanged frame 9, with the flange extending entirely therearound. The hinge elements are secured to the sash and frame in the usual manner, with the hinge elements of the sash rigidly connected at one side of the sash at top and bottom upon the face of the flange 9.

The numeral 10 designates the storm shutter as a whole, embodying a panel of any desirable material, either of compressed fiber board, plywood or metal, such as aluminum, each being light in weight and easily handled. The panel 11 is cut to the approximate dimensions of the sash flange 9, so that, in use, the panel will completely overlie the sash. When used in connection with the type of sash illustrated, the corner of the panel 11 is cut away, at 12, both upper and lower upon one side, to provide clearance for the hinge mountings. The cut-away 12 may obviously vary with different windows and, when the device is employed with the well known awning type windows, the cut-away 12 is entirely avoided. Each panel 11 is provided along one vertical edge, with a fixed metallic channel member 13, bolted or riveted to the panel, as at 14. The attaching flange of the channel 13 is relatively wider than its companion parallel flange 15. The channel preferably extends for the full height of the shutter, as shown. The channel is of a width to accommodate the edge of the panel, with sufficient clearance to permit the flange 15 to snugly engage over the vertical flange 9 of the sash, as clearly shown in Figures 3 and 4, at assembly.

Mounted for shifting movement upon the opposite vertical edge of panel 11, is a channel clamp, designated as a whole by the numeral 16. The clamp 16 comprises a relatively wide flange 17 and a shorter parallel flange 18. The flanges 17 and 18 and their connecting wall, provide a channel having a width equal to the width of the channel 13. The clamp 16 extends for the full height of the free edge of the panel 11. The flange 17 is provided with a plurality of equidis-

tantly spaced horizontal slots 19, slidably engaging over stud bolts 20, fixed with respect to the panel 11, as shown in Figure 6. The stud bolts 20 carry wing nuts 21, through the medium of which, the flange 17 may be rigidly clamped in adjusted position with respect to the panel 11. The channel 13 and clamp 16 are preferably formed of any well known non-oxidizing material, calculated to withstand wear and avoid rusting.

In the use of this form of the invention, when a condition exists that requires the protection of storm shutters, the operator moves the sash to open position. The channel member 13 is then engaged with the flange 9 of the sash in the manner illustrated in Figure 3, the clamp 16 having first been fully extended. The panel is then swung into contacting position with the face of the sash, at which time the clamp 16 is moved inwardly, guided by its slot and bolt mounting, until the flange 18 snugly engages the vertical flange 9 upon the side of the sash opposite to the channel 13. After the clamp has been forced into rigid contact with the flange 9, the wing nuts 21 are turned down to clamping position, thus insuring against accidental shifting of the clamp. The panel is thus rigidly secured in protective position, completely covering the glass of the sash against breakage. The mounting of the panel permits freely swinging movement of the sash. In dismounting the panel, the operator merely loosens the wing nuts 21 and slides the clamp outwardly to disengage the flange 9, after which the panel is removed by a side motion to disengage the channel 13. While the panel has been illustrated as being clamped upon the inner flange of the sash, it will be perfectly obvious, that the channel 13 and clamp 16 may be reversed with equal success.

In Figure 7, a slightly modified form of the invention has been illustrated. In this form, the panel 22 is cut away at 23, similar to the panel 11. A similar clamp member 24, having a flange 25, corresponding in dimensions to the flange 17, is provided with a plurality of diagonally arranged slots 26, slidably engaging over stud bolts 27, carrying wing nuts 28. The purpose of arranging the slots 26 diagonal, is to impart a wedging action against the bolts 27, as the clamp is moved to sash engaging position, thus further adding to the rigidity of the clamping action. The operation of this form of shutter is identical to that first described.

In Figure 8, a further modified form of the invention has been illustrated. In this form of the invention, the shutter 29 carries the channel 30 along one horizontal edge, preferably the top edge, while the clamp 31 is shiftably mounted along the opposite horizontal edge of the shutter, preferably the lower edge. The operation is identical, except that the shutter is mounted by first engaging the channel 30 over the upper flange 9 of the sash and the shutter swung inwardly to engage the face of the sash, after which the clamp 31 is moved to clamping engagement with the lower flange 9 of the sash and clamped rigidly

in position by the nuts 32. This last form of the invention is particularly adaptable where the windows are of a height from the ground where it would be relatively inconvenient for the operator to install the shutters of the type of Figure 1, without the aid of a ladder.

From the foregoing, it will be seen that a very novel and greatly simplified type of storm shutter has been provided. The device may be manufactured at a minimum cost as compared with other shutters now in use, since it is unnecessary to drill and tap openings in the sash for attachment, automatically adjusts itself to slight variations in the width of standard sash, requires no bolts, bars or like fastening means to retain the shutter in place and may be quickly installed or removed with a minimum effort. The panel will positively protect the sash against foreign objects and will permit the sash to be used in the normal manner, offering no obstacle to the complete closing and latching of the sash.

It is to be understood, that while preferred embodiments of the invention have been shown and described, various changes in the shape, size and arrangement of parts may be resorted to as modified by prior art devices and the spirit and scope of the subjoined claim.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

A storm shutter for metal casement sash having a flanged frame entirely therearound, comprising a panel having a dimension that corresponds to the outer dimension of the sash flange, the sash being supported by substantially vertically aligned hinge elements, and the panel being notched at upper and lower corners upon one vertical edge to clear the hinges but contact at least the upper surface of the lower hinge, a channel member fixedly carried by the opposite vertical edge of the panel, the channel extending for the full height of the panel, a channelled clamp supported upon the opposite vertical edge of the panel and extending for the full length of the free edge of the panel, the clamp providing a short flange parallel to the edge of the panel, a plurality of stud bolts carried by the panel inwardly of the last named free edge, a plurality of slots formed in the channelled clamp for the reception of the bolts, nuts threaded upon the bolts, the clamp adapted to be shifted inwardly and outwardly of the panel edge and guided by the slots and bolts, the short flange of the clamp adapted to engage over the flange of the sash when the clamp is adjusted inwardly.

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