

Sept. 18, 1951

H. MORRISON
VENTILATION SHUTTER

2,568,355

Filed May 29, 1947

2 Sheets-Sheet 1

FIG. 1

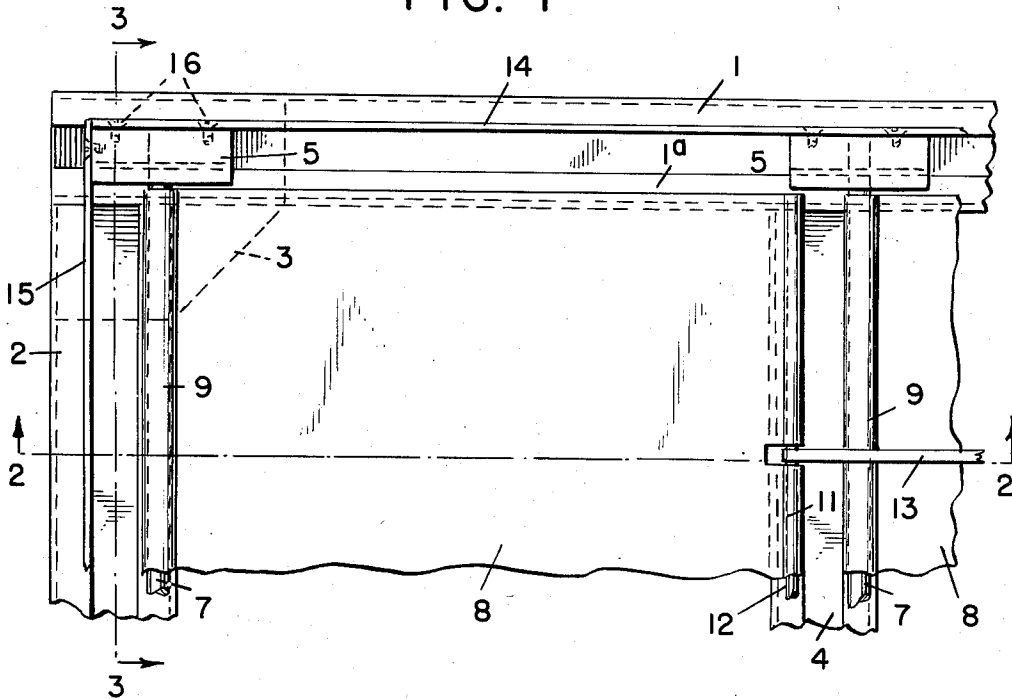
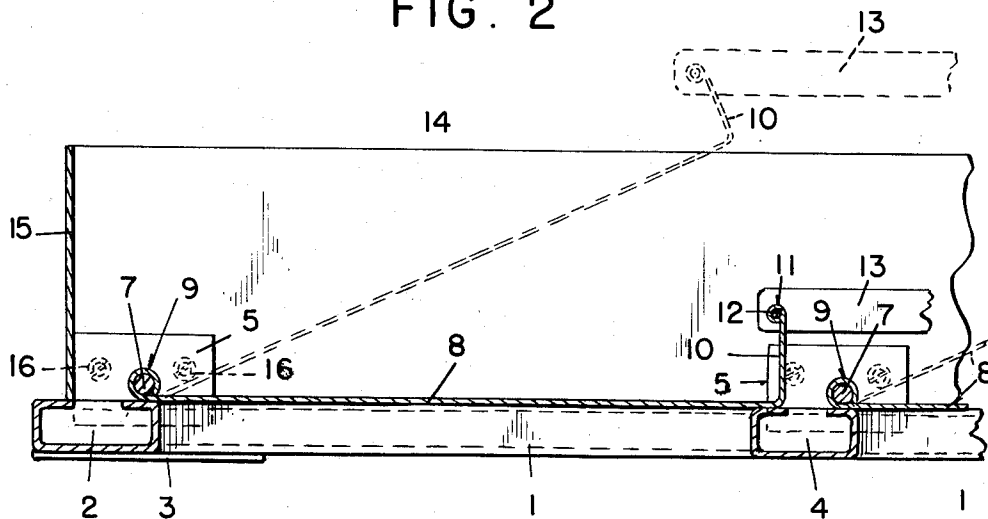


FIG. 2



HACKLEY MORRISON,
Inventor

By Stone, Boyden & Mack,

Attorneys.

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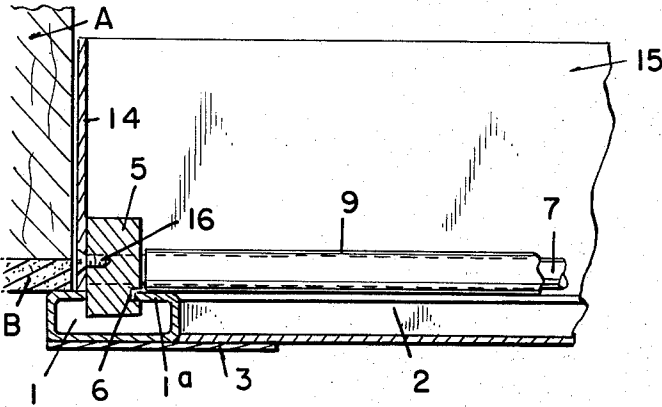


FIG. 3

FIG. 4

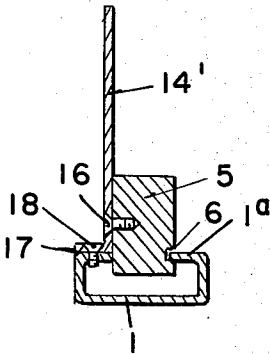


FIG. 5

FIG. 6

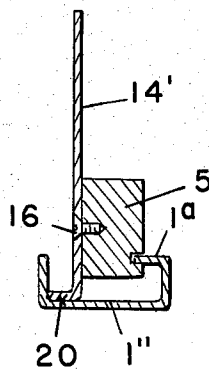
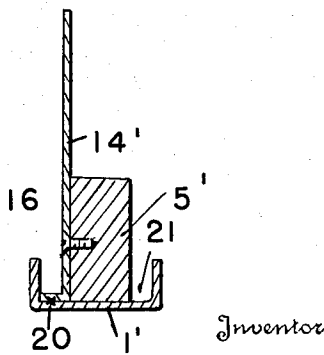
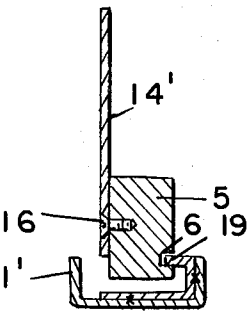


FIG. 7



Inventor
HACKLEY MORRISON,

By *Stone, Boyden & Mack,*

Attorneys.

UNITED STATES PATENT OFFICE

2,568,355

VENTILATION SHUTTER

Hackley Morrison, Houston, Tex., assignor, by
mesne assignments, to Hackley Morrison, Jr.

Application May 29, 1947, Serial No. 751,166

11 Claims. (Cl. 98—119)

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This invention relates to attic ventilating equipment and more particularly to automatic shutter frames forming a part of such equipment.

In my prior copending applications Serial Nos. 741,380 and 741,381, filed April 14, 1947, I have shown ventilating equipment including such automatic shutters. The present invention relates specifically to improved details of construction of automatic shutters of the type illustrated in the above identified applications.

An object of the invention is to provide an automatic shutter having a frame formed of channel members so constructed as to overlap the edges of the ceiling opening and constitute a trim.

Another object is to provide improved means for mounting and hinging the shutter doors on the frame.

Still another object of the invention is to devise improved means for mounting upon such a frame the plates constituting the "neck" referred to in said prior copending applications.

With the above and other objects in view, the invention consists in the construction and arrangement of parts hereinafter described and claimed, and illustrated in the accompanying drawings, forming part of this specification, in which

Fig. 1 is a fragmentary plan view of my improved automatic shutter, the shutter doors being shown as closed;

Fig. 2 is a longitudinal section substantially on the line 2—2 of Fig. 1 looking in the direction of the arrows, the shutter doors being shown in dotted lines in partially open position;

Fig. 3 is a transverse section substantially on the line 3—3 of Fig. 1 looking in the direction of the arrows; and

Figs. 4, 5, 6 and 7 are fragmentary transverse sections similar to Fig. 3, but with parts omitted, showing several modified constructions which I may employ and which fall within the scope of the invention.

Referring to the drawings in detail, I construct my improved shutter frame of side and end channel members 1 and 2, these members being joined at the corners and connected by means of gusset plates 3, spot welded to the channel members.

In Figs. 1 to 4 I have shown the members 1 and 2 as in the form of what is known commercially as a box channel, that is to say a channel having at its free edges inwardly extending flanges 1a. The rectangular frame thus constructed is reinforced at intervals along its length by cross bars 4 also shown as in the form of box channels. In practice it is usually satisfactory to construct

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the main frame of channels $1\frac{1}{2} \times \frac{1}{2}$ inches in size and the cross bars $1 \times \frac{1}{2}$ inches. Other dimensions may of course be used, if desired.

Carried by the side channel members 1 are pairs of oppositely disposed supporting blocks 5. As shown in Figs 1 to 4 these blocks are provided at one side with a notch 6 adapted to fit over the edge of one of the intumed flanges 1a. In this way the blocks extend partially down into the open side of the channel members.

Hinge rods 7 extend across the frame between the side members and have their ends received in openings in pairs of the supporting blocks 5. A shutter door 8, preferably of light sheet metal, such as aluminum, is secured at one edge to each hinge rod 7, the preferred method of securing being to roll the sheet metal around the rod as indicated at 9.

In this connection it may be pointed out that the shutter doors may be firmly secured to the rods 7, and the ends of the rods journaled in the blocks 5, or the rods may be set firmly in the blocks 5 and the shutter doors loosely secured to the rods.

The end of each door 8 opposite the rod 7 is bent upwardly at right angles as shown at 10 in Fig. 2, and these bent up ends of all of the doors are pivotally connected by means of a tie-bar 13. The metal at the edge of the bent up portion is preferably rolled around a rod 12, as indicated at 11, and this rod passes freely through an opening in the tie-bar 13.

In Fig. 3 a joist supporting the attic floor and the ceiling B below is shown at A, and as set forth in my above mentioned prior copending applications, it is desirable to provide a "neck" extending up through the opening in the ceiling and lying closely adjacent to the faces of these joists. In the present application, I have shown this neck formed of plates 14 and 15, the lower edges of which are secured to the outer face of the blocks 5 as by means of screws 16.

By reference to Fig. 3, it will be particularly noted that the blocks 5 are located along the middle of the side channel members 1 and are of less width than these members, so that the channel members project laterally beyond the blocks on the inside and beyond the neck plates on the outside of the frame. The end members 2 also project laterally beyond the neck plates. The shutter doors 8, when closed, rest upon those portions of the side members which project inwardly beyond the face of the blocks, while the portions of these side members and of the end members which project outwardly beyond the faces of the

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neck plates overlap the edges of the opening in the ceiling. Thus these frame members serve as a trim around such opening, and are secured to the ceiling by wood screws passing upwardly through the outwardly projecting portions into the joists A.

In Fig. 3, and some of the other figures where box channels are used, it is the inwardly directed flanges 1a at the upper sides of such channels which support the shutter doors on the one hand and engage the edge of the ceiling B on the other hand.

It will be observed that as the blocks 5 are firmly interlocked with the side channel members and the neck plates 14 are secured directly to the blocks, the construction provides a rigid unitary structure which is adapted to be prefabricated and then placed in position in the ceiling opening.

In Fig. 4, I have shown a slightly modified construction in which, while a box channel similar to that of Fig. 3 is employed, the lower edge of the neck plate 14' is turned outwardly as at 17 and secured to the flange of the box channel 1 as by means of screws 18.

In Fig. 5 I have shown a composite channel structure made up of a standard channel member 1' and a special liner 19, preferably formed of sheet metal and nested within the channel and spot welded thereto. This liner has an inwardly projecting flange adapted to engage the notch 6 of the supporting blocks 5. Such a composite channel is probably cheaper to produce than the special box channel shown in Figs. 1 to 4.

In Fig. 6 I have shown a box channel 1'' provided with an inwardly directed flange 1a only at one side, that is to say on the inside of the frame. On the outside, the neck plate 14' is extended down past the block 5 to the bottom of the channel and is provided with a laterally projecting extension 20 spot welded to the bottom of the channel.

Finally, in Fig. 7 I have again shown the use of a standard channel 1', and in this figure the block 5' is not provided with any notch. The block rests upon the bottom of the channel and the lower edge of the neck plate 14' has an out-turned portion 20, as in Fig. 6, resting upon and spot welded to the bottom of the channel.

It will be particularly noted that in Fig. 7 the block 5' does not extend the full width of the channel but is spaced from the inner flange thereof as shown at 21. Thus in this figure, as in the other figures, there is provided a portion of the channel member at the inside of the frame, which projects beyond the face of the blocks and which serves as a support on which the shutter doors 8 rest when closed.

It will be observed that in all of the modifications, I employ a frame constructed of upwardly opening channel members, and that the blocks which support the hinge rods are firmly united with the channel members and with the plates forming the neck of the shutter frame, thus producing an exceptionally strong and rigid structure.

What I claim is:

1. A ventilating shutter comprising a rectangular frame adapted to fit a ceiling opening and composed of upwardly opening channel members having side flanges lying in parallel planes, neck plates in addition to said side flanges secured to said channel members and constructed to extend up inside of the ceiling opening, said neck plates being so disposed relative to said channel mem-

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bers that the latter extend outwardly beyond said plates to constitute a trim overlapping the edges of the ceiling opening, supporting blocks carried by opposite channel members and extending at least partially down into the open side thereof, and shutter doors pivotally mounted on said supporting blocks and normally closing the opening embraced by said frame.

2. A ventilating shutter comprising a rectangular frame adapted to fit a ceiling opening and composed of upwardly opening channel members having side flanges lying in parallel planes, neck plates in addition to said side flanges secured to said channel members and constructed to extend up inside of the ceiling opening, said neck plates being disposed near the transverse middle of each of said channel members, so that the latter extend laterally both inwardly and outwardly of said plates, supporting blocks extending at least partially down into the upper open side of opposite channel members on the inside of said plates and shutter doors pivotally mounted on said supporting blocks and normally resting, when closed, on the inwardly extending portion of said channel members, that portion of said channel members extending outwardly beyond said plates overlapping the edges of the ceiling opening, whereby said channel members serve as a trim around said opening.

3. A ventilating shutter comprising a rectangular frame adapted to fit a ceiling opening and composed of upwardly opening side and end channel members, pairs of oppositely disposed bearing blocks carried by and extending within the upper open side of said side channel members at points inside of said ceiling opening, hinge rods extending across said frame and having their ends journaled in said pairs of blocks, and shutter doors secured to said hinge rods.

4. A ventilating shutter comprising a rectangular frame adapted to fit a ceiling opening and composed of upwardly opening side and end channel members, pairs of oppositely disposed supporting blocks carried by and extending within the upper open side of said side channel members at points inside of said ceiling opening, hinge rods extending between said side channel members and having their ends received in openings in said pairs of blocks, and shutter doors carried by said hinge rods.

5. A ventilating shutter comprising a rectangular frame adapted to fit around a ceiling opening and composed of side and end members, said side members being in the form of upwardly opening box channels having on at least one side an inwardly directed flange, pairs of oppositely disposed supporting blocks carried by said box channels, each block having at one side a notch engaging the edge of said flange, means at the opposite side of said block for holding said notch in engagement with said edge, hinge rods extending between said box channels and having their ends received in openings in said pairs of blocks, and shutter doors carried by said hinge rods.

6. A ventilating shutter comprising a rectangular frame adapted to fit around a ceiling opening and composed of side and end members, said side members being in the form of upwardly opening box channels having on at least one side an inwardly directed flange, pairs of oppositely disposed supporting blocks carried by said box channels, each block having at one side a notch engaging the edge of said flange, means at the opposite side of said block for holding said notch

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in engagement with said edge, hinge rods extending between said box channels and having their ends received in openings in said pairs of blocks, and shutter doors carried by said hinge rods, said doors overlapping and resting upon said flange.

7. A ventilating shutter comprising a rectangular frame adapted to fit around a ceiling opening and composed of side and end members, said side members being in the form of upwardly opening box channels having on at least one side an inwardly directed flange, pairs of oppositely disposed supporting blocks carried by said box channels, each block having at one side a notch engaging the edge of said flange, hinge rods extending between said box channels and having their ends received in openings in said pairs of blocks, shutter doors carried by said hinge rods, and neck plate extending around all four sides of said frame and rigidly united at the corners, said neck plates being adapted to extend up into said ceiling opening, and the neck plates adjacent said side members being secured to the opposite side of said blocks.

8. A ventilating shutter comprising a rectangular frame adapted to fit a ceiling opening and composed of upwardly opening side and end channel members, pairs of oppositely disposed supporting blocks carried by and extending within the open side of said side channel members at points inside of said ceiling opening, hinge rods extending between said side channel members and having their ends received in openings in said pairs of blocks, and neck plates secured to and carried by said blocks and adapted to extend up into said ceiling opening.

9. A ventilating shutter comprising a rectangular frame adapted to fit a ceiling opening and composed of upwardly opening side and end channel members, pairs of oppositely disposed supporting blocks carried by and extending within said side channel members, hinge rods extending between said side channel members and having their ends received in openings in said pairs of blocks, and neck plates secured to said blocks and to the bottom of said channel members, and adapted to extend up into said ceiling opening.

10. A ventilating shutter comprising a rectangular frame adapted to fit around a ceiling opening and composed of side and end members, said side members being in the form of upwardly opening box channels having on at least one side an inwardly directed flange, pairs of oppositely disposed supporting blocks carried by said box channels, each block having a notch engaging the edge of said flange, hinge rods extending between said box channels and having their ends received in openings in said pairs of blocks, shutter doors carried by said hinge rods, and neck plates secured to said blocks and to the bottom of said channel members, and adapted to extend up into said ceiling opening.

11. A ventilating shutter comprising a rectangular frame adapted to fit a ceiling opening and composed of upwardly opening side and end channel members, pairs of oppositely disposed supporting blocks carried by and extending within the open side of said side channel members at points inside of said ceiling opening, hinge rods extending between said side channel members and having their ends received in openings in said pairs of blocks, said blocks being of less width than said side channel members, whereby said members project inwardly of said frame beyond the face of said blocks, and shutter doors carried by said hinge rods and resting upon the said inwardly projecting portions of said channel members.

HACKLEY MORRISON.

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