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3,543,441

VERTICALLY SLIDABLE DOOR

Filed Feb. 20, 1969

2 Sheets-Sheet 1

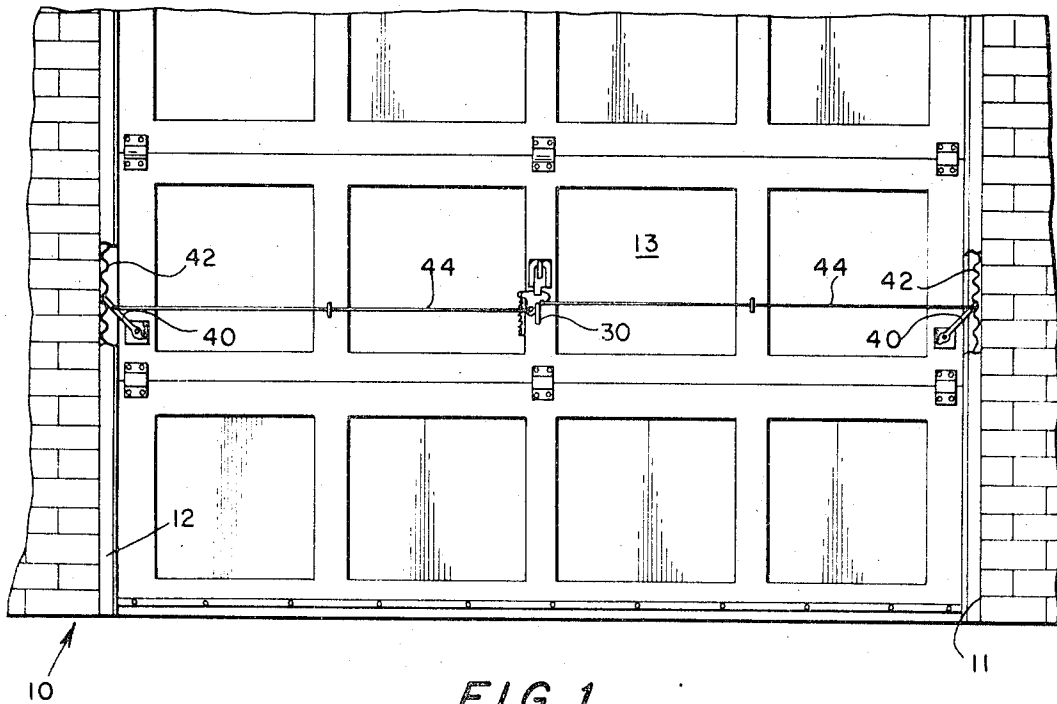


FIG. 1

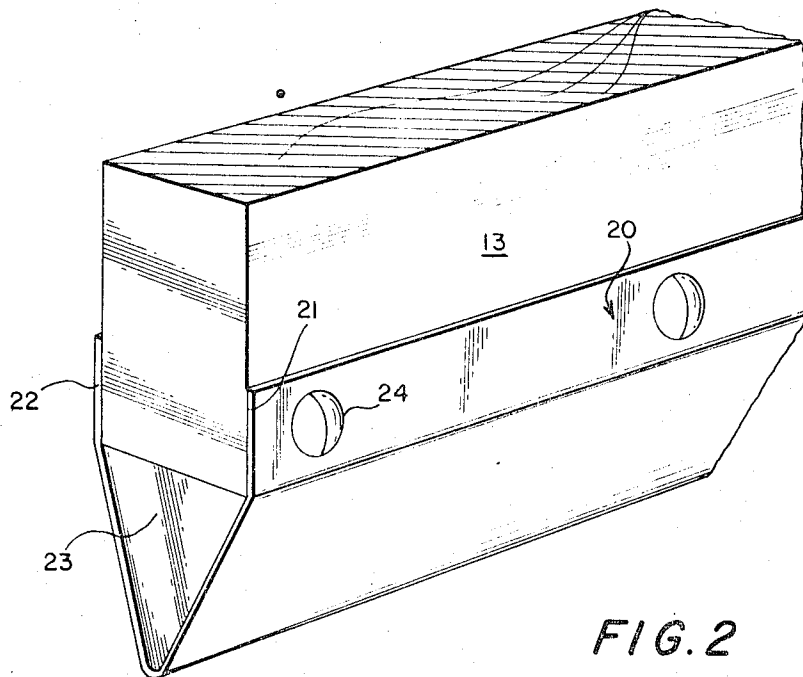


FIG. 2

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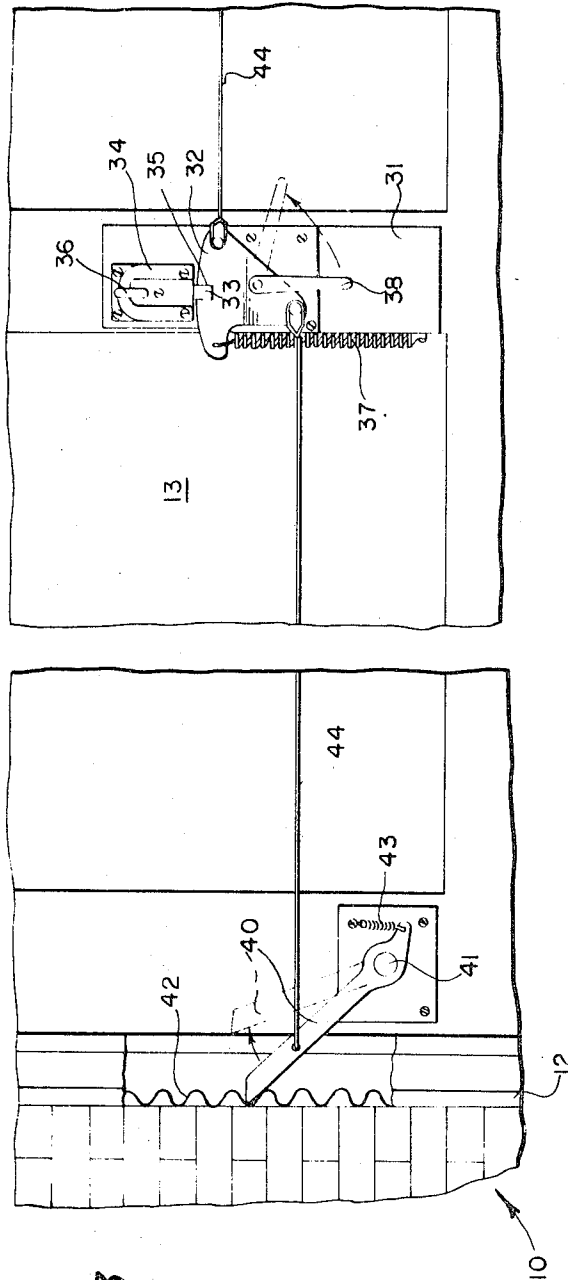


FIG. 3

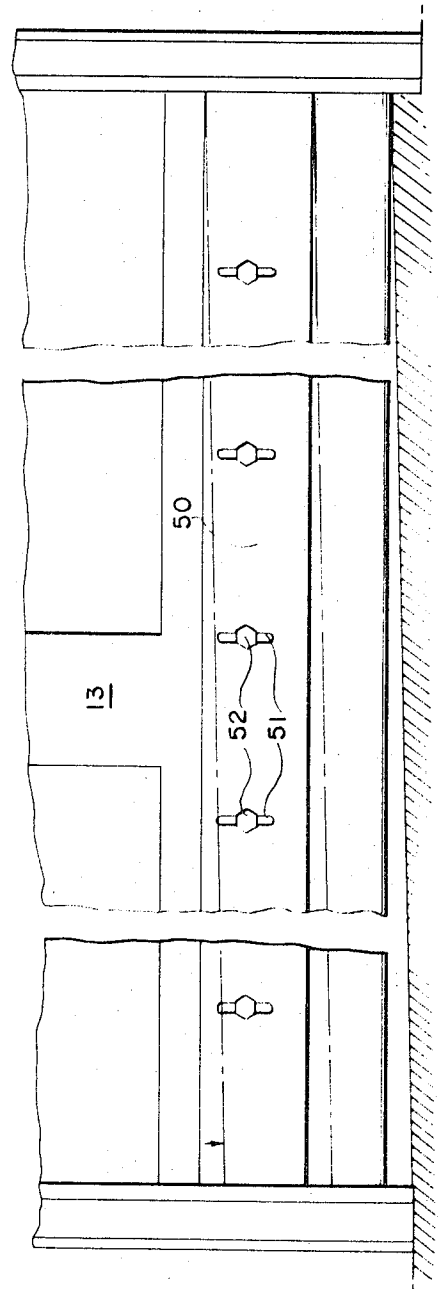


FIG. 4

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3,543,441

VERTICALLY SLIDABLE DOOR

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6 Claims

ABSTRACT OF THE DISCLOSURE

A vertically movable exterior door for a building such as a garage, etc., is provided with a metal channel member or strip having a V-shaped cross section fixed to its bottom rail to displace loose or hard snow, ice or stones on the floor surface in the entrance, so the door may be closed with snow on the ground. The metal strip may be adjusted to the angle made by the floor surface with the door guide tracks or door frame. A latch mechanism has a plurality of engaging elements fixed on the building at the side of the door and vertically spaced so the door may be latched when the lower edge is prevented from engaging the floor surface by ice or hard snow.

This invention relates to a door for closing the entrance to a building, especially to a garage.

A common type of garage door is vertically slidable, and when lowered engages the floor surface of the entrance to the garage. A centrally operated latch mechanism operates pawls at each side of the door which engage latch elements fixed to the building at the side of the door.

In severe winter weather, the accumulation of snow in the entrance creates a problem in closing and locking the door. The snow banks against the door and is packed by the automobile when moving into or out of the garage. Every time the car passes through the entrance, more snow will be packed on the floor surface, so that it soon becomes impossible to close the door against the floor surface.

Consequently, the snow must be dug away from the door and the entrance kept clear of snow. In wintry weather, or during a snowfall, the snow must be cleared as often as the car passes in or out. Such a task becomes very burdensome if the car is frequently used.

The object of this invention is to form the door so that its downward movement will pass through or displace snow accumulated on the floor surface, and frequent clearing of the snow will be unnecessary.

This object is accomplished by securing a metal member or strip along the lower edge of the door, the member having a V-shape cross section with its edge engaging the floor surface in the entrance. When the door is moved downwardly, the V-shape edge of the member displaces snow accumulated in the entrance, so the door may contact the floor surface and completely close the opening.

A further object of the invention is to connect the metal member or strip to the door so that the angle of the strip to the vertical may be adjusted to conform to the angle which the floor surface makes with the side of the door. If, as is often the case, the floor surface is not exactly normal to the side of the door, the strip may be fastened to engage the floor surface along the entire width of the door.

A further object is to provide for locking the door even though its engagement with the floor surface is obstructed. At times, snow or ice will collect on the floor surface and become so hard that the door will not cut through or displace the ice or snow. In order to assure that the door will be locked, even though the lower edge

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will not displace the snow and ice, the latch mechanism is formed for engagement in a plurality of vertically spaced positions. When the lower edge of the door strikes ice on the floor surface, the latch mechanism will allow the door to be locked in that position.

DRAWINGS

The invention is illustrated in the drawings in which:

FIG. 1 is an inside view of a garage entrance with the vertically slidable door closed.

FIG. 2 is a fragmentary perspective view of a portion of the lower edge of the door, showing the strip fastened to the door.

FIG. 3 is an enlarged, fragmentary view of the latch mechanism used to fasten the door.

FIG. 4 is an elevation view of the lower edge of the door, showing the adjustable strip.

DESCRIPTION

The building structure 10 is provided with an entrance opening 11 having standard roller guide tracks 12 in the frame bordering the sides of the entrance and a floor surface at the lower side of the opening. A door 13 formed of hinged panels in conventional form is vertically slidable on the guide tracks 12. The door is also provided with wheels (not shown) riding in the guide tracks 12 on the sides of the opening in a conventional manner.

Along the lower rail of the door, a metal strip 20 is secured by fastening elements such as screws or bolts. This member may be made of sheet material formed into a modified channel having flanges 21, 22, engaging opposite sides of the door rail. The base or central portion 23 of the channel is tapered to constitute a V-shape in cross section, as may be seen in FIG. 2. The fasteners 24 are provided to secure the member 20 to the door.

A latch mechanism 30 is mounted on the inner side of the door. The fixed plate 31 fixed to the door carries a pivoted plate 32 which may be locked against movement by a lock bolt 33 of lock 34 engaging in a notch 35 in the plate. The lock bolt 33 may be withdrawn by a knob 36 or by a key on the outside of the door, as in the customary form of lock. A spring 37 fixed at one end to plate 32 and at its other end to fixed plate 31 exerts force to bias the pivoted plate 32 from latching position. A handle 38 or a handle on the outside rotates the plate 32 to lock the door.

At each side of the door, a pawl 40 is pivoted on the door at 41 to engage latching elements 42 fixed to the building at each side of the opening. These elements may be integral with the roller guide tracks 12 and are spaced vertically, so that the pawls 40 will engage the elements 42 on opposite sides of the entrance even though the door may not be completely closed because of obstruction.

Each pawl 40 is held in engagement with one of the elements 42 by a spring 43. The two pawls are connected to the pivoted plate 32 by cables 44, so that rotation of the pivoted plate draws the cables toward the center and rotates the pawls 40 out of engagement with the latch elements 42.

In many instances, the floor surface at the entrance is not normal to the sides of the opening and the door will not engage the floor surface along its entire length. To overcome this difficulty, so that the door will close tightly, the strip 50, similar to metal member 20, is adjustably fastened. This strip has elongated openings 51 to receive fasteners 52. With the member 50 only loosely fastened, the door is lowered until the member 50 engages the floor surface throughout its length, and then

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the fasteners are tightened to maintain the metal member in position.

The strip 20 in FIGS. 1 and 2 may also be adjusted to conform to the floor surface when installed. The strip is positioned along the floor before the screws 24 are inserted and the holes are then drilled in the wood rail of the door to receive the screws.

It will be readily apparent that the V-shape of the member 20 or 50 may be tapered at a sufficiently acute angle to displace snow packed on the surface at the entrance, so that it may engage the surface. The apex of the channel is not made too sharp, to avoid danger from such an edge, but is adequate for the purpose of passing through snow. When the snow or ice is hard enough to obstruct movement of the door, the latch will allow the door to be locked in its obstructed position. The adjustable strip provides for engagement with the floor surface along the entire width of the door, in those doors with frames which are not normal to the floor surface. With the edge engagement of the strip, any unevenness of the floor surface may be overcome by grooving the floor below the door to allow the strip to engage throughout its length.

I claim:

1. In a building structure having an exterior entrance, with a floor surface in said entrance, a vertically slidable door closing said entrance and having a metal lower edge in engagement with a floor surface bordering said opening, said lower edge of said door being downwardly tapered, the opposite sides of said edge converging downwardly to intersect at an angle to form a V-shape edge in cross section, so that said edge forms a wedge to displace snow or other material on said floor surface and allow engagement by said V-shape edge.

2. In a structure as claimed in claim 1, in which said metal lower edge is formed as a sheet metal strip bent into a channel shape having spaced, flat parallel sides integral with flat converging walls forming said V-shape edge, said parallel sides being secured to said door.

3. In a structure as claimed in claim 2, in which said metal strip is angularly adjustable.

4. In a ground attached building structure having an exterior entrance with a floor surface on the ground in said entrance, a vertically slidable door closing said entrance and engaging with the floor surface, said door hav-

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ing a channel shape metal strip forming the lower edge with the lower margin of the door received between and secured to the flanges of said strip, the bottom of the channel having flat sides converging downwardly to intersect at an angle in a V-shape in cross section to form a tapered lower edge on said door, so that said edge forms a wedge to displace snow or other loose material on said floor surface and allow said V-shape edge to engage said floor surface.

5. In a building structure as claimed in claim 4, in which said channel member is adjustably secured to said door panel to allow said strip to be positioned angularly on said door to conform to the angle between said floor surface and the door frame.

6. In a ground attached building structure having an exterior entrance, with a floor surface on the ground in said entrance, a vertically slidable door for the entrance, said door having a metallic member secured along its lower edge, said member being downwardly tapered with flat sides converging downwardly to intersect along a line and a V-shape in cross section, so that upon closing said door downwardly against the floor surface of the entrance, said V-shape strip forms a wedge to displace snow or other material to close the entrance, and a latch mechanism on said door and engageable with vertically spaced latch elements on the sides of said entrance to prevent raising said door when said latch mechanism is in engagement with any of said elements, so that said door may be latched shut in different vertically spaced positions if downward movement of the door is obstructed by ice or other material.

References Cited

UNITED STATES PATENTS

88,502	3/1869	Morris	49—488 X
1,452,703	4/1923	Pollard	49—488
1,922,009	8/1933	Axe	49—450 X
2,274,552	2/1942	Kingsland	49—27 X
3,407,537	10/1968	Urbanick	49—483

J. KARL BELL, Primary Examiner

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49—197, 483, 488; 160—201