Sept. 27, 1966 D. N. BAILEY 3,274,733

METAL STORM DOOR AND STOP THEREFOR

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Fig. 2.

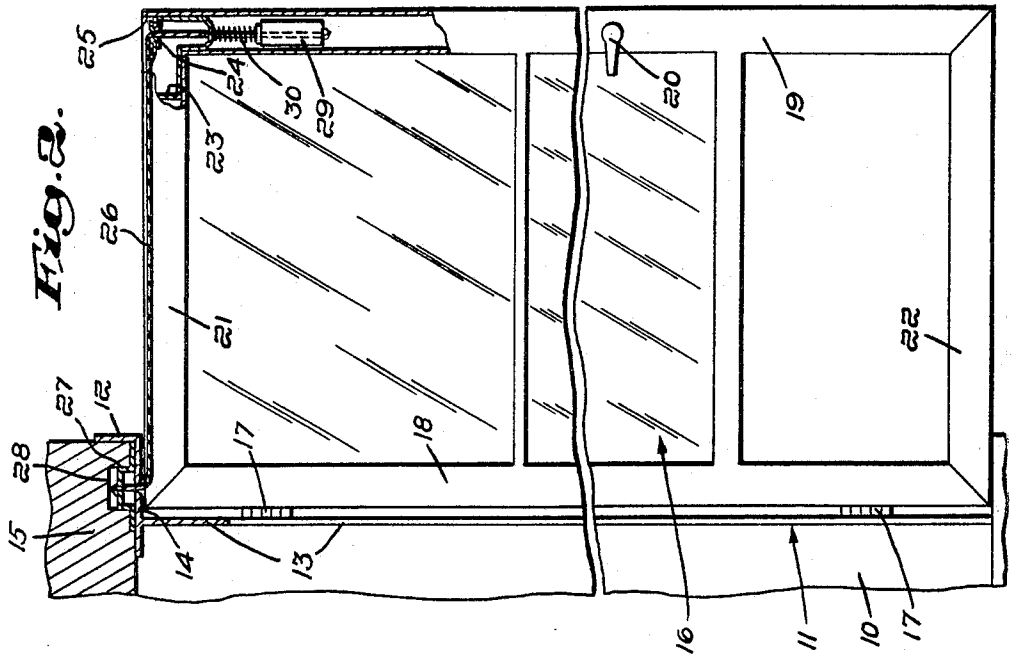
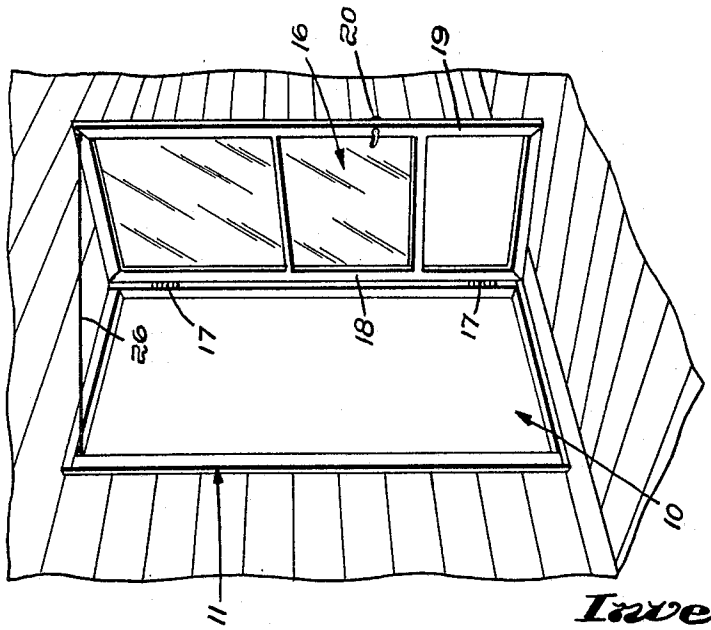


Fig. 1.



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METAL STORM DOOR AND STOP THEREFOR

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Fig. 5.

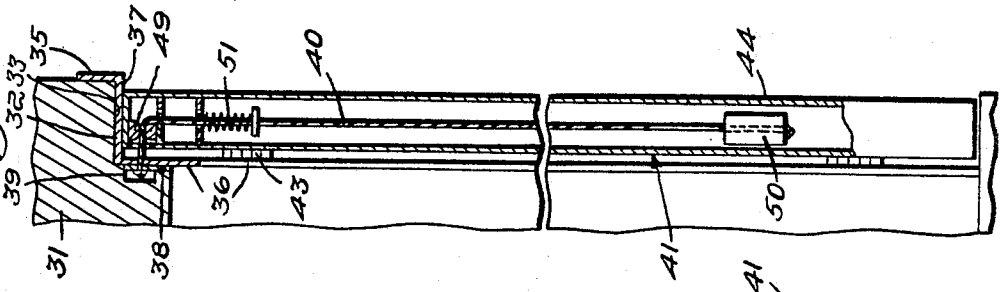


Fig. 4.

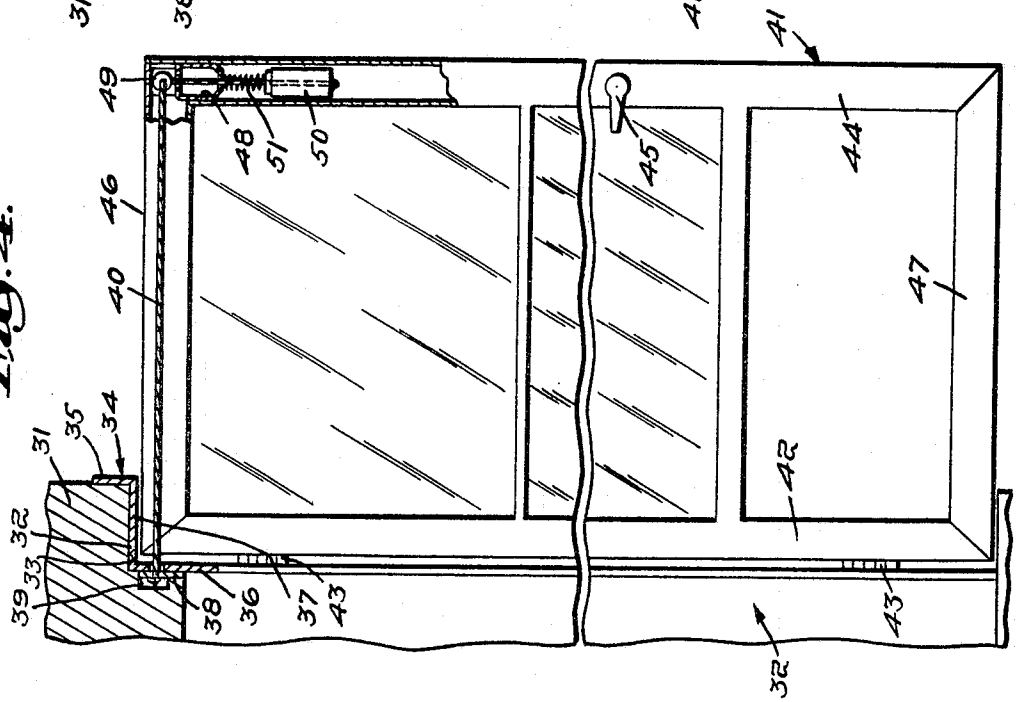
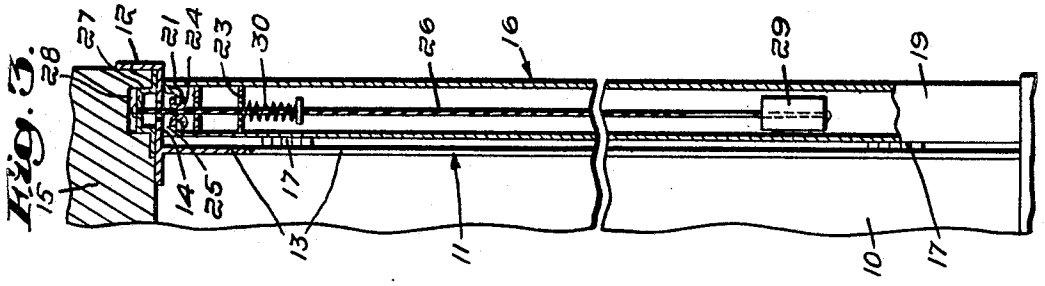


Fig. 3.



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Fig. 6.

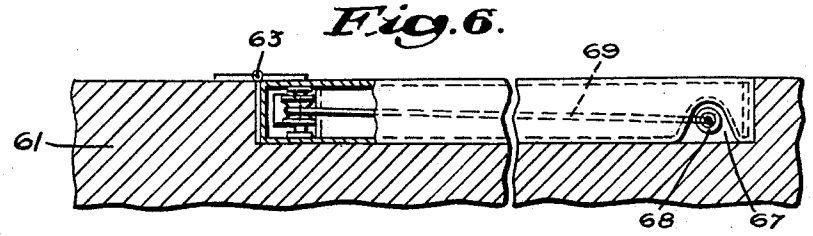


Fig. 7.

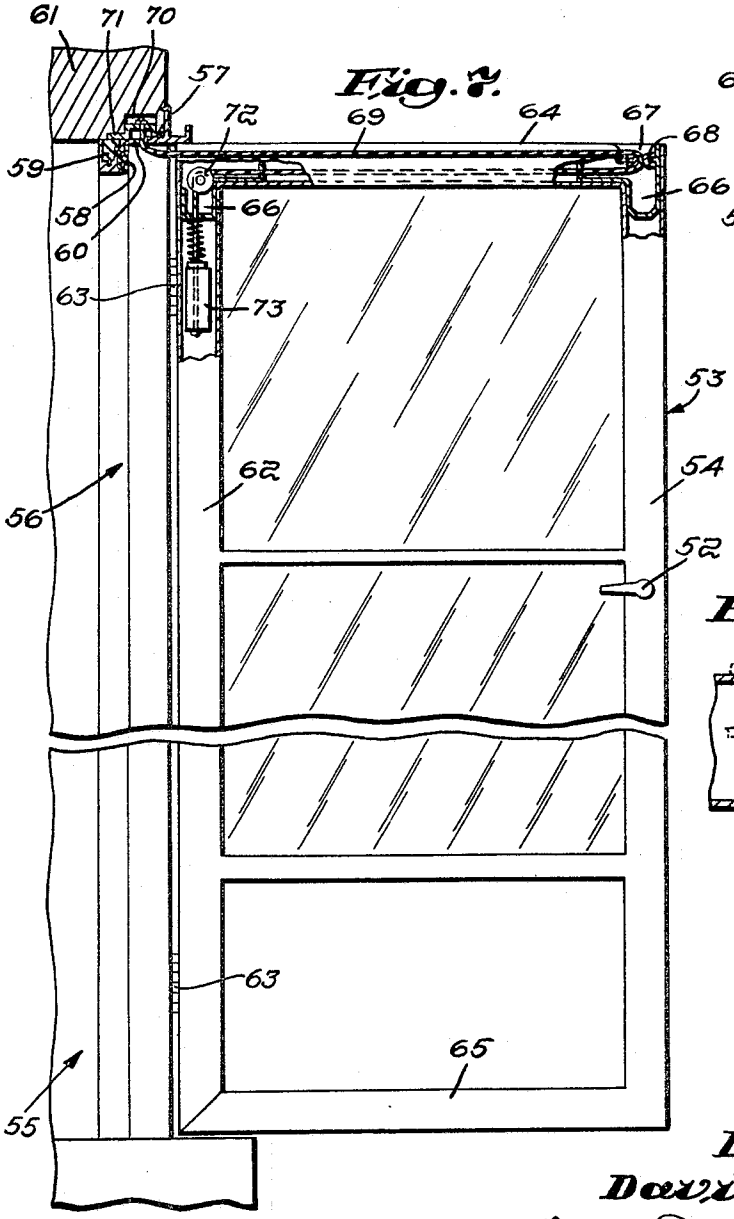


Fig. 8.

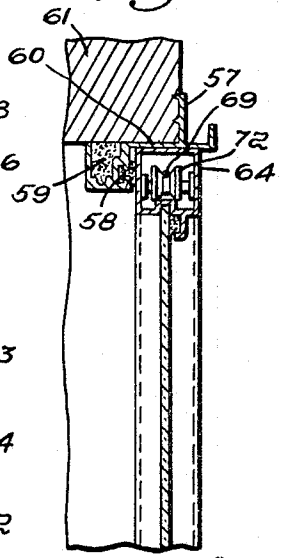
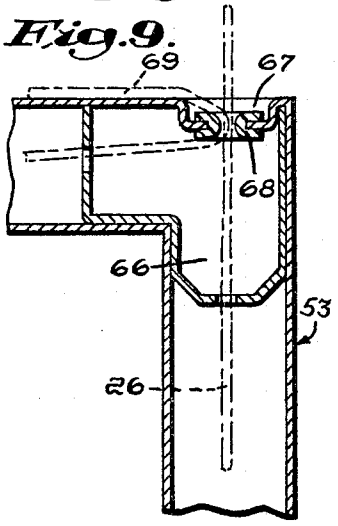


Fig. 9.



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3,274,733

METAL STORM DOOR AND STOP THEREFOR

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3 Claims. (Cl. 49—387)

The present invention relates to metal storm doors and to stop means to prevent their being damaged if blown open.

Metal storm doors are widely used and are well adapted to give long and satisfactory service except for one undesirable feature. It frequently happens that such doors are blown open or caught by the wind when partly opened. When this happens, metal storm doors often become damaged as the stops with which they are provided are incapable of opposing the considerable force exerted thereon due to the fact that such stops are located on the hinge sides of the doors.

The principal objective of the present invention is to provide protection against damage from that cause without limiting their utility and appearance. In accordance with the invention, this objective is attained by utilizing the hollow construction of the top and sides of metal storm doors with one of the sides housing a vertically slidable weight and with the upper corner of the latch side having an opening through which a flexible member extends with one end secured to the weight and the other end anchored to the top of the frame from the door. A resilient bumper is interposed between the weight and the opening for engagement by the weight thus resiliently to limit movement of the door as it approaches its wide open position as determined by the length of the flexible member within the door when in its closed position.

The weight may be slidably housed in either side of the door and the opening may be in the top or in the inner face of the upper corner of the latch side and it is preferred that such a door be used with a metal frame which is employed to overlie and securely hold the anchor.

In the accompanying drawings, there are shown illustrative embodiments of the invention from which these and other of its objectives, novel features, and advantages will be readily apparent.

In the drawings:

FIGURE 1 is a perspective view of a door and door fram in accordance with the invention, the door being shown in its wide-open position,

FIGURE 2 is a vertical section, on a substantially increased scale, through the door frame with the door in its open position and with the inner face of the door partly broken away on its latch side,

FIGURE 3 is a vertical section through the door and door frame, the door being shown in its closed position.

FIGURE 4 is a view similar to FIGURE 2 illustrating another embodiment of the invention,

FIGURE 5 is a vertical section through the door and door frame shown in FIGURE 4, the door being in its closed position,

FIGURE 6 is a cross section of a door frame showing the top of a door in accordance with another embodiment of the invention, the top of the door being broken away at the hinge side thereof,

FIGURE 7 is a view of that door and its frame, the view being similar to FIGURES 2 and 4,

FIGURE 8 is a fragmentary vertical section of the door and frame of FIGURES 6 and 7, the door being in its closed position and the section being taken adjacent the hinge side, and

FIGURE 9 is a fragmentary section, on an increased scale taken approximately along the indicated lines 9—9 of FIGURE 6.

The doorway **10**, in the embodiment of the invention illustrated by FIGURES 1–3, is shown as having a generally indicated metal frame **11** extending along its sides and top. The metal frame **11** is of Z-shaped section, see FIGURES 2 and 3, thus presenting an external trim flange **12**, a parallel, oppositely disposed inner flange **13**, and an intermediate portion **14** anchored to the jamb **15** at a substantial number of places as by screws, not shown.

A metal storm door is generally indicated at **16** and is connected to the jamb **15** by means of hinges **17** on its side member **18**. The other side member **19** is provided with a latch **20**. The side members **18** and **19**, the top member **21** and also the bottom member **22** are hollow, commonly hollow extrusions, and are joined to provide corners by welding or, as shown, by corner gussets **23** to which the ends of appropriate members are connected by screws or rivets.

At the upper corner of the door **16** on its latch side, the top member **21** has a grommet **24** located in a depression **25** extending centrally of its upper face and opening inwardly of the door, see FIGURE 2. The depth of the depression **25** is such as to accommodate the cable **26** as the door **16** swings into and out of its closed position. One end of the cable **26** extends through the intermediate portion **14** of the top of the frame **11** where its flanged anchor **27** is entered in a pocket **28** in the jamb **15**, with its flanges held against dislodgment by the top of the frame **11**. The pocket **28** overlies the grommet **24** when the door is closed.

The gusset **23**, at the corner of the door **16**, is provided with vertically alined passages enabling the other end of the cable **26** to be introduced therethrough into the latch side member **19** and attached to a weight **29** which is vertically slidable in the side member **19**, and operative to pull the cable **26** downwardly into the side member **19** as the door **16** closes. The cables **26** also passes axially through a coiled compression spring **30** attached to and backed by the gusset **23** through which the cable passes thereby to provide a resilient stop when the door swings into its wide open position as determined by the length of the cable **26** within the latch side member **19** when the door **16** is in its closed position.

In the embodiment of the invention illustrated by FIGURES 4 and 5, the jamb **31** of the doorway **32** has a rabbet **33** for the generally indicated metal frame **34**. The metal frame **34** is of Z-shaped section and has an external trim flange **35**, a parallel, oppositely disposed, inner flange **36**, and an intermediate portion **37** which is anchored in place as by a plurality of spaced screws, not shown, with part of the inner flange **36** within the rabbet **33** and securely retaining the anchor **38**. A pocket **39** in the jamb receives the extremity of the cable **40** that is attached to the anchor **38**.

The generally indicated door **41**, like the door **16**, has a hollow side member **42** provided with hinges **43**, a side member **44** provided with the latch **45**, a top member **46**, and a bottom member **47**. These are hollow and joined by corner gussets such as the gussets **48** joining the top member **46** and the latch side member **44**.

The door **41** has a grommet **49** in the rear face of the upper corner of the latch side, the grommet **49** registering with the pocket **39** when the door **41** is closed. The cable **40** passes downwardly through the grommet **49** and through vertically alined holes in the corner gusset **48** into the side member **44** when it is attached to a weight **50** vertically slidable therein and by which the cable **40** is pulled in as the door **41** closes. The cable **40** also passes axially through a coiled spring **51** backed by the corner gusset **48** thereby to provide a resilient stop as the door approaches its wide-open position as determined by the length of cable **40** within the side member **44** when the door **41** is closed.

It will be noted that, in the embodiments of the invention thus far described, the wide-open positions of the doors have been established by the lengths of the cables that are within the latch sides thereof. Where the location of the latch, the latch **52** of the generally indicated door **53** for example, is such that an insufficient length of cable may be received within the hollow latch side member **54** to provide a desired, wide-open position, the embodiment of the invention illustrated by FIGURES 6–8 is used.

With reference to FIGURES 6–8, the doorway **55** has a generally indicated metal frame **56** which is also of Z-shaped cross section providing an external trim flange **57**, an oppositely disposed, parallel, inner flange **58** channeled to receive insulation **59**, and an intermediate portion **60** secured to the jamb **61** at a plurality of spaced zones as by screws, not shown.

The door **53** has, in addition to the hollow latch side member **54**, a hollow side member **62** provided with hinges **63** and hollow top and bottom members **64** and **65**, respectively. The appropriate ends of appropriate door members are joined to provide door corners as by corner gussets **66**.

In this embodiment of the invention, the upper surface of the top member **64** is provided at the upper corner of the latch side with a control depression **67** in which a grommet **68** is located, the depression opening inwardly of the door and being of a depth to accommodate the cable **69** as the door swings into and out of its closed position and being located so that the grommet **68** underlies the pocket **70** in the jamb **61** for the flanged anchor **71** to which one end of the cable **69** is attached and which is securely held by the top part of the frame **56** which is apertured to receive that cable end.

The cable **69** extends through the grommet **68** and through a hub in the gusset **66** of that corner and thence lengthwise of the top member **64**. The gusset **66** at the top of the hinge side of the door is provided with a pulley **72** about which the cable **69** is trained and has end openings permitting the cable to extend downwardly into the hinge side member **62** where it is connected with a weight **73** slidable therein. The cable **69** also extends through a coiled spring **74** backed by the proximate end of the proximate gusset **66** thereby to provide a resilient stop when the wide open portion of the door is reached as determined by the length of cable within the door members **62** and **64** when the door is closed.

Where grommets are used, they may be of any type ensuring the free travel of the cable and those of nylon are satisfactory. Other anti friction means may be used. The weights can be used to pull the door closed or simply to pull the cable into the doors as they close and they are preferably a free but close fit in the side members

and are provided with a cushiong coat or the equivalent to sure quiet door operation.

From the foregoing, it will be appreciated that safety stops are provided that protect metal storm doors even if slammed into their wide-open positions by winds of high velocity. The protection is due both to the resilient stop effect, to the fact that it is applied at the latch side, and to the fact that the metal door frame affords an excellent anchoring means. These results are attained without detracting from the appearance of the doors or interference with their use.

I claim:

1. In combination, a door frame, and a metal storm door hingedly mounted within said frame of the type having hollow top, hinge and latch sides, and with said latch side being blocked by a latch, a weight vertically slidable in one of said sides, said door having an opening in the form of an anti-friction grommet adjacent the upper corner of the latch side thereof, a flexible member extending through said opening and connected to said weight, the free end of the flexible member being attached to the top of the frame for the door adjacent the latch side of the door when the door is closed, and a resilient bumper secured within said one side adjacent the upper end thereof and engageable by said weight for resiliently limiting movement of said door as it approaches its wide-open position, said position being determined by the length of said flexible member within said door when said door is in its closed position.

2. The door of claim **1** in which the opening is in the inner face of the door.

3. The combination of claim **1** in which the frame includes a metal frame secured to a supporting jamb, the top of the jamb having a pocket behind an opening in the metal frame both located to register with the opening in the door when the door is closed, and the flexible member extending through the opening in the metal frame and secured to an anchor in the pocket, the anchor being flanged and in engagement with the metal frame.

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