Dec. 18, 1956 P. B. WOLVERTON 2,774,116

DOUBLE ACTING RELIEF VALVE

Filed Aug. 11, 1954

Fig. 1.

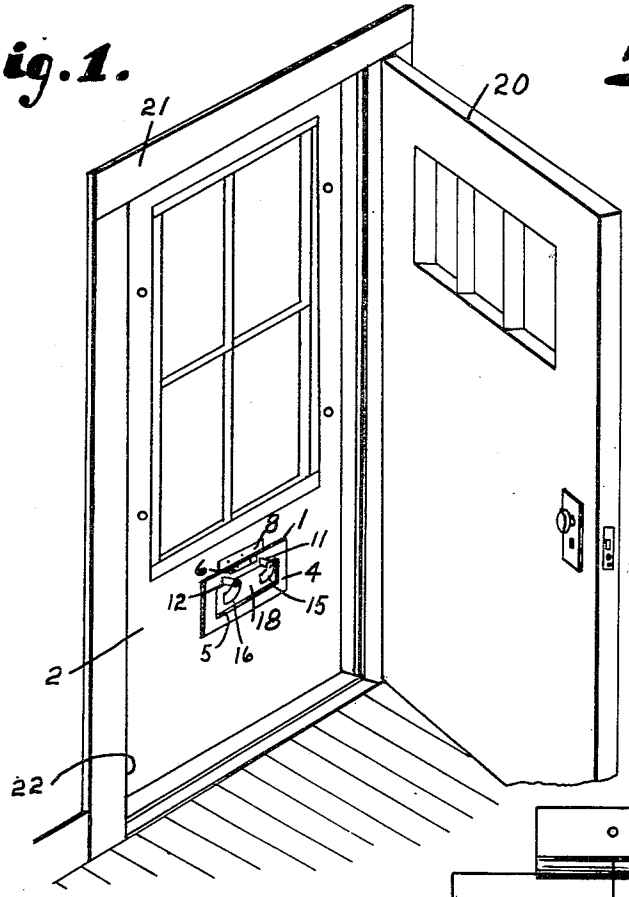


Fig. 2.

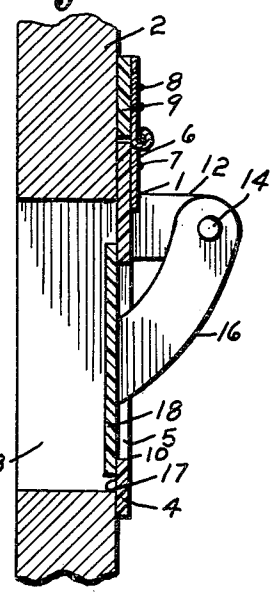


Fig. 3.

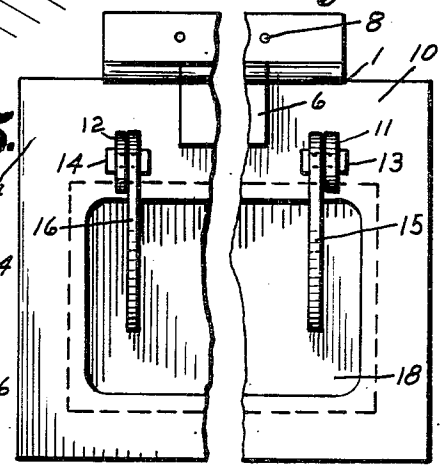


Fig. 4.

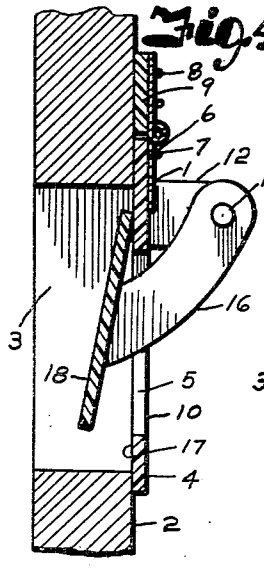
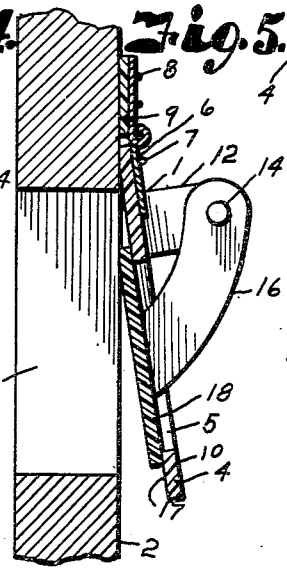


Fig. 5.



INVENTOR.

Percy B. Wolverton

BY

Fishburn & Mullendore

ATTORNEYS.

United States Patent Office 2,774,116 Patented Dec. 18, 1956

2,774,116

DOUBLE ACTING RELIEF VALVE

Percy B. Wolverton, Kansas City, Kans.

Application August 11, 1954, Serial No. 449,125

2 Claims. (Cl. 20—16)

This invention relates to a double acting relief valve, and more particularly to a valve for use in storm doors for releasing air pressure or vacuum between the storm door and the exterior door of the house when the door is either opened or closed.

In the past with the use of storm doors difficulty is encountered both in opening and closing of such storm doors and also the exterior door of the house or building in which the storm door is used due to the air pressure entrapped between such doors in closing or the causing of a vacuum therebetween at the start of the opening of such doors.

The principal objects of the present invention are to provide a double acting relief valve in said storm door to release the air entrapped between the exterior and storm door during closing and to relieve the vacuum during opening of the doors; to provide an opening in the storm door through which said air is relieved; to provide a valve having an opening therein engaging over the opening in the storm door; to provide an auxiliary valve engaging over the opening in the main valve and swingable in the opening in the storm door and allowing release of air therethrough when the doors are being closed; to provide a hinged mounting for the main and auxiliary valves whereby both valves will swing away from the opening in the storm door upon opening of either or both doors, and to provide a device of this character simple and economical to manufacture.

In accomplishing these and other objects of the present invention, I have provided improved details of structure the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of the valve shown attached to the storm door.

Fig. 2 is a vertical cross-sectional view through the valve and showing it attached to the storm door.

Fig. 3 is a fragmentary front view of the valve showing the opening in the main valve and the auxiliary valve in dotted lines closing said opening.

Fig. 4 is a vertical cross-sectional view showing the auxiliary valve in open position.

Fig. 5 is a vertical cross-sectional view showing the main and auxiliary valves in open position.

Referring more in detail to the drawings:

1 designates a double acting relief valve embodying the features of my invention shown attached to a storm door 2 having an opening 3 therein. The opening is here shown to be of substantially rectagular shape, but I do not wish to be limited to any particular shape as other shapes and sizes may be used without departing from the spirit of my invention.

The main valve or plate 4 is also of substantially the same shape. One-half a hinge 6 is secured to the top side of the valve or plate 4 by screws or the like as indicated at 7. The other half of the hinge is secured to the storm door by screws or the like as indicated at 8. A plate 9 of the same thickness as the body of the main valve is provided underneath the second half of the hinge so that

the main valve will be mounted in straight alignment with the face of the door to cover the opening 3. Extending outwardly from the face 10 of the plate 4 are lugs or ears 11 and 12 and pivotally mounted thereon by pins 13 and 14 are curved arms 15 and 16 extending into the opening 5 of the plate 4 and substantially flush with the inner face 17 thereof, to which is attached an auxiliary valve plate or closure member 18 which hangs within the opening 3 of the storm door and normally lies flat against the inside surface 18 of the valve 4 to close the opening 5 in the main valve.

In operation of the device assembled as described, when the exterior door 20, secured to the door frame 21 to close the opening 22 of a room, is closed and the storm door 2 is also closed the main valve plate 4 and auxiliary valve plate 18 will hang in normally closed position as indicated in Fig. 2 with the main valve 4 closing the opening 3 in the storm door and the auxiliary valve 18 closing the opening 5 in the main valve 4.

Upon opening the door 20 instead of entrapping air between the two doors the main and auxiliary valve will both swing inwardly toward the exterior door as shown in Fig. 5 to allow the air to enter through the opening 3 in the storm door to prevent a vacuum being created normally caused by entrapped air between the two doors. When the suction is relieved after the door is opened the valves will resume their normal position. Closing of the door 20 will cause air normally entrapped between the doors to exert pressure on the auxiliary valve plate 18 causing it to swing outwardly in the opening 3 in the storm door as shown in Fig. 4 thus preventing a vacuum between the doors of the plate 18. When the air is released the valve 18 will resume its normal position against the face 17 of the plate 18 closing the opening 5.

The valve will operate in the same manner upon opening and closing the storm door as described in connection with the main or exterior door 20.

It will be obvious from the foregoing that I have provided an improved double acting valve for releasing of air pressure between the storm and main door of an enclosure which acts to relieve the air pressure on either closing or opening of the door.

What I claim and desire to secure by Letters Patent is:

1. In combination with a main door of a building structure and a storm door having an opening therein exteriorly of said main door for passage of air therethrough entrapped between said doors, a double acting relief valve comprising a plate having an opening therein hinged to the inner face of the storm door covering the opening in the storm door, ears projecting from the plate, curved arms pivotally connected to said ears and extending through the opening in said plate, a second plate secured to the free ends of said arms and covering the opening in the first named plate and swingable in said opening in the storm door, said last named plate comprising a valve and seating against the inside of the first named plate around said opening therein, whereby both of said plates will swing toward said main door when opening said doors and the second plate will swing into said opening in the storm door to relieve the air from between said doors upon closing said doors.

2. In combination with a main door of a building structure and a storm door having an opening therein exteriorly of said main door for passage of air therethrough entrapped between said doors, a double acting relief valve comprising a plate having an opening therein hinged to the inner face of the storm door covering the opening in the storm door, said plate being secured so as to hang in straight alignment with the face of the door and being slightly larger than the opening in the storm door, ears projecting from the plate, curved arms pivotally connected to said ears and extending through the opening in said

plate, a second plate slightly larger than the opening in the first named plate, secured to the free ends of said arms and covering the opening in the first named plate and swingable in said opening in the storm door, said last named plate comprising a valve and seating against the inside of the first named plate around said opening therein, whereby both of said plates will swing toward said main door when opening said doors and the second plate will swing into said opening in the storm door to relieve the air from between said doors upon closing said doors.

References Cited in the file of this patent

UNITED STATES PATENTS

2,101,315	Kemp	Dec. 7, 1937
2,224,494	White	Dec. 10, 1940

OTHER REFERENCES

American Builder Magazine, July 27, 1938, page 152.