Jan. 13, 1931. A. H. MILLS 1,788,928

STORM DOOR

Filed April 5, 1930 2 Sheets-Sheet 1

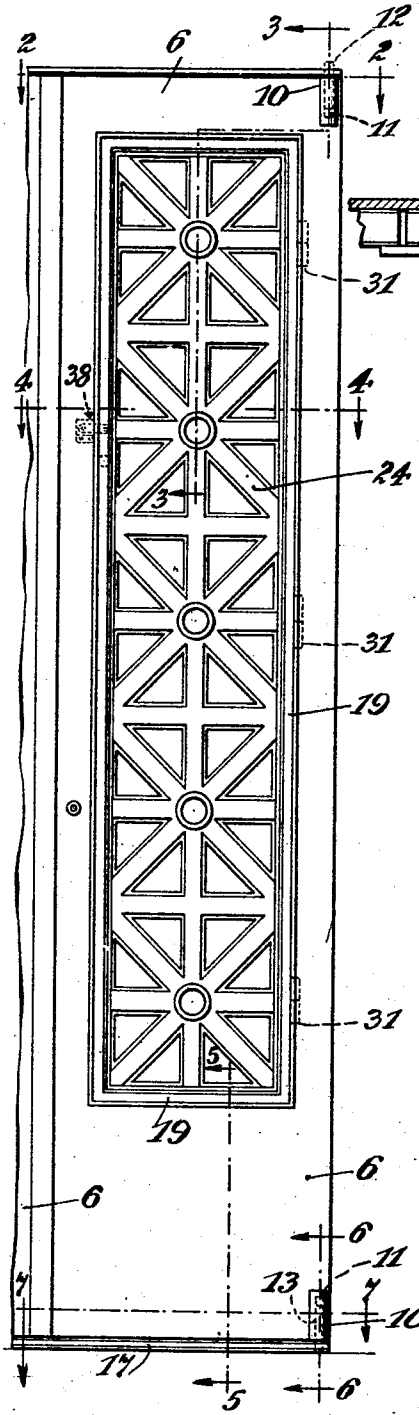


Fig. 1.

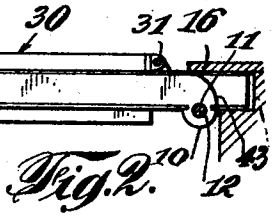


Fig. 2.

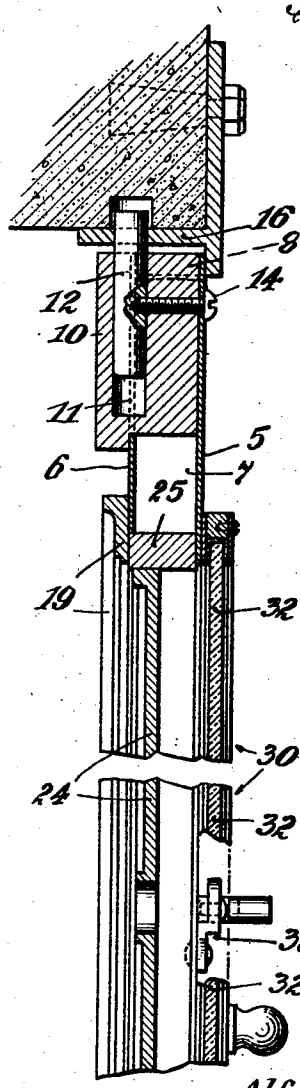


Fig. 3.

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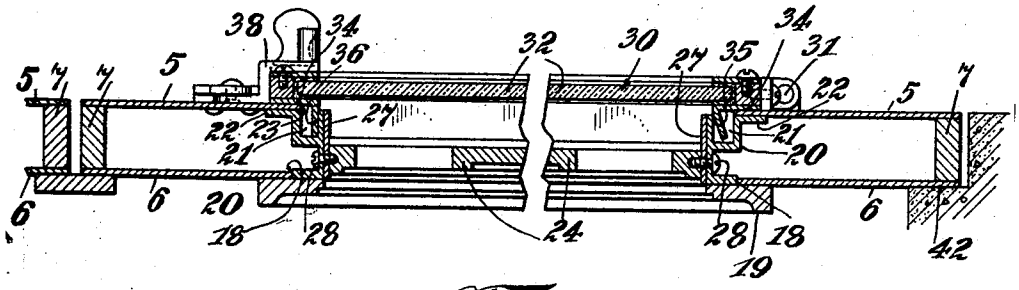


Fig. 4.

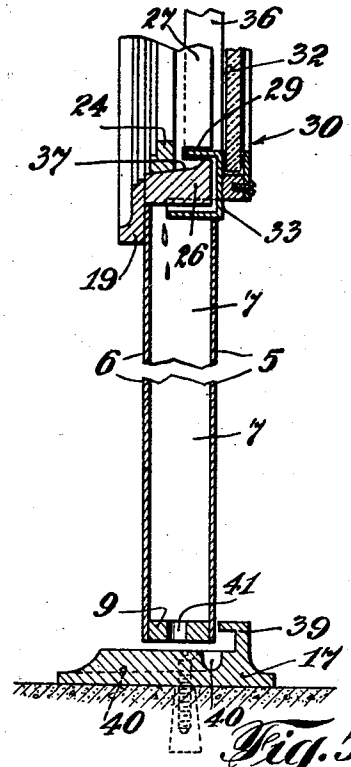


Fig. 5.

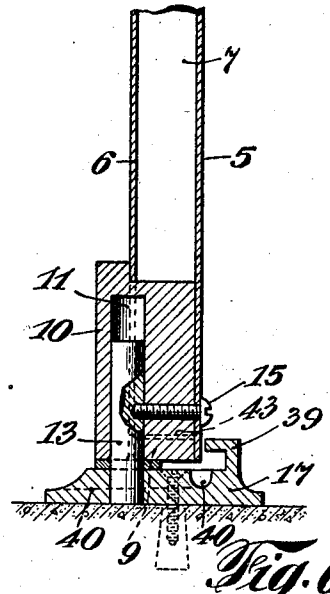


Fig. 6.

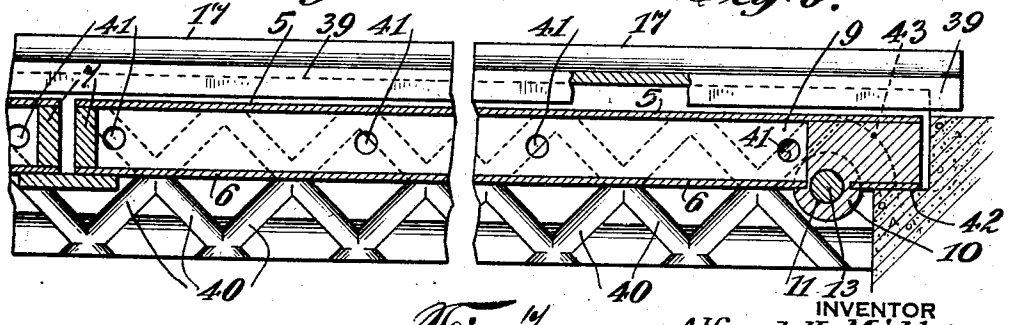


Fig. 7.

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UNITED STATES PATENT OFFICE

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STORM DOOR

Application filed April 5, 1930. Serial No. 441,765.

This invention relates to storm doors, and has for its primary object and purpose to provide a storm door for houses or residences which is simple and durable in construction, ornamental in appearance and is provided with means for effectively excluding water from passage to the inner side of the door and for draining the same exteriorly thereof.

It is a more particular object of the invention to provide a storm door having an open-work ornamental grille and a hinged window on the inner side of the door opposed to said grille, together with means operating when the window is closed to effect a water tight seal preventing the passage of driving rain through the grille to the inner side of the door.

It is also another important feature of the invention to provide a storm door having a hollow body structure and the frame of the pivoted window at its lower end having means cooperating with a part of the door structure at the lower end of the ornamental grille to effectively drain the water entering through the grille away from the inner face of the door and through the hollow lower end portion thereof.

With the above and other objects in view, the invention consists in the improved storm door and in the form, construction and relative arrangement of its several parts as will be hereinafter more fully described, illustrated in the accompanying drawing, and subsequently incorporated in the subjoined claims.

In the drawings, wherein I have disclosed one simple and practical embodiment of the invention, and in which similar reference characters designate corresponding parts throughout the several views,—

Figure 1 is an outer side elevation of a storm door illustrating one embodiment of my present improvements;

Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary vertical section taken on the line 3—3 of Fig. 1;

Fig. 4 is a horizontal sectional view taken on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged vertical section of the lower end portion of the door taken on the line 5—5 of Fig. 1;

Fig. 6 is a detail vertical section taken on the line 6—6 of Fig. 1, and

Fig. 7 is a horizontal sectional view taken on the line 7—7 of Fig. 1.

In the accompanying drawings, for purposes of illustration, I have shown one of a pair of two similar storm doors which are adapted to be mounted in the door frame or opening for swinging or pivotal movement at the opposite vertical sides thereof, the free edges of the doors when closed, meeting on substantially the central vertical line of the door opening. However, it will be understood that the structure to be presently described might also be embodied in a single door for completely closing the door frame or opening. As shown herein, each door consists of the inner and outer body plates 5 and 6 respectively, arranged in spaced parallel relation to each other, said plates being rigidly connected by the vertical side bars 7, the top bar 8 and the bottom bar 9. The top and bottom bars at one of their ends and at the outer side of the door are formed with semi-cylindrical portions indicated at 10 concentric with the cylindrical bores 11 which receives vertically disposed pivot rods 12 and 13 respectively. These rods are rigidly fixed against axial rotative movement relative to the door structure by set screws indicated at 14 and 15 respectively.

The upper pivot rod 12 is journalled in an opening provided in one flange of an angle bar 16 suitably secured to the face of the masonry at the top of the door opening, and

the lower pivot rod 13 is similarly journalled in an opening provided in one end of the sill or threshold bar 17 which is suitably anchored to the floor structure.

The outer door plate is provided with an opening therethrough indicated at 18 of elongated rectangular form and extending the greater portion of the length of the door as indicated in Fig. 1 of the drawings. An ornamental metal frame bar 19 is suitably secured to the outer face of the door plate 6 and projects inwardly beyond the edges of the opening 18. To the inner face of this frame bar at the opposite vertical sides thereof and within the opening 18 one of the flanges of the angular metal bars 20 are welded or otherwise permanently secured. These bars are of the angular cross sectional form as shown in Fig. 4 of the drawings, and have vertically extending channels 21 opening towards the inner side of the door and the flanges 22 which are welded or otherwise secured to the inner door plate 5 along the opposite vertical edges of a window opening 23 in said door plate.

An ornamental grille 24 is positioned between the top bar 25 and the lower horizontal bar 26 extending between the inner and outer door plates at the lower end of the opening 18 in the latter plate, suitable weather strips indicated at 27 being interposed between the vertical sides of the grille and the bars 20 and rigidly secured with the grille to said vertical bars by means of the screws or other suitable fastening devices indicated at 28. The inner side walls of the channels 21 in the bars 20 and the weather strips 27 adjacent to the lower horizontal bar 26 are provided with horizontal recesses or notches shown at 29 for a purpose which will be later explained.

A window generally indicated at 30 is mounted upon the inner side of the door plate 5 adjacent one vertical edge of the opening therein between suitable brackets attached to the door plate for swinging movement on the vertical pivots indicated at 31. This window includes a suitable frame structure in which the window glass 32 is tightly sealed around the edges thereof, said frame structure having a lower horizontal cross piece 33 of channel shaped form with upper and lower spaced flanges extending outwardly through the opening in the door plate 5 when the window is closed. The window frame also includes vertical side bars 34, the said bar adjacent the pivoted side of the window having an outwardly projecting flange 35 obliquely inclined at an angle of less than 90° while the other side bar 34 has a flange 36 projecting outwardly at a 90° angle with respect to the plane of the window. These flanges are adapted to extend into the channels 21 of the side bars 20 of the door structure and closely engage the inner walls of said channels to prevent the passage of water into said channels. However, by obliquely inclining the flange 35, the window may be readily swung to its open and closed position.

The upper surface of the horizontal bar 26 is outwardly and downwardly inclined as indicated at 37 and when the window is closed, the upper relatively narrow flange of the channel bar 33 of the window frame is received in the recesses 29 of the bars 20 and the strips 27, while the lower wider flange of the frame bar 33 extends beneath and in spaced relation to the bar 26. A suitable latch device indicated at 38 is provided for tightly securing the pivoted window 30 in its closed position.

The sill or threshold bar 17 is provided along its inner edge with an upstanding angular flange 39 and the surface of said sill bar is formed with a plurality of intersecting drainage channels 40. These channels receive the water draining through openings 41 provided in the lower horizontal bar 9 of the door structure and discharge such water beyond the outer edge of the sill 17.

From the above description, the several advantages of my improved storm door structure will be clearly understood. In fair weather, the window 30 may be swung to open position for purposes of ventilation, while the doors remain closed. In stormy or inclement weather, the windows are securely latched in closed position. By the close cooperation of the flanges 35 and 36 with the inner walls of the channels 21, the entrance of a hard driving rain passing through the grille into said channels is prevented. The rain water will therefore, collect upon the upper inclined surface 37 of the bar 26 and will finally overflow between the upper inner edge of said bar and the top flange of the channel bar 33 of the window frame and be directed outwardly by the lower flange of the channel bar and into the lower hollow section of the door as indicated in Fig. 5 of the drawings, the water finally passing off through openings 41 into the drain channels 40 of the sill bar 17.

In the illustrated embodiment of my invention, I show the pivot pins or rods 12 and 13 spaced inwardly from the edge of the door so that the door edge may abut against the stop shoulder indicated at 42 on the masonry or door frame to limit the swinging movement of the door to closed position. The lower portion of the bar 9 adjacent to the pivot 13 is cut away as indicated by the dotted line 43 in Fig. 7 of the drawings to permit swinging movement of the door to open position without interference by the flange 39 of the sill or threshold bar 17.

From the above description considered in connection with the accompanying drawings,

the several structural features of my new storm door will be clearly understood. It will be seen that I have produced a house storm door which is of simple and substantial construction as well as ornamental in appearance and which will effectively exclude the penetration of water through the open-work grille thereof to the inner side of the door, while providing means for securing the desired ventilation while the door itself may remain securely locked in closed position. I have herein shown and described a practical and desirable embodiment of my present improvements, but it will nevertheless, be understood that as to the several detail parts thereof, the essential features of the invention might also be incorporated in various other structural forms, and I accordingly, reserve the privilege of resorting to all such legitimate changes therein as may be fairly incorporated within the spirit and scope of the invention as claimed.

I claim:

1. A storm door including a hollow door structure having a window opening therethrough, an open-work grille fixed to the door structure within said opening, said door structure having water outlet openings at the bottom thereof, a window mounted upon the inner side of the door for closing said opening, said window and door structure having cooperating parts for preventing the passage of water entering through the grille to the inner side of the door and for directing the water into the lower hollow part of the door for passage through said drainage openings.

2. A storm door including a hollow door structure having a window opening therethrough, an open-work grille fixed to the door structure within said opening, said door structure having water outlet openings at the bottom thereof, a window mounted upon the inner side of the door for closing said opening, said door structure including vertical bars extending along the opposite sides of said opening having channels opening toward the inner side of the door, outwardly projecting flanges on said window adapted to be received in said channels and engaging the inner side walls thereof to exclude water from the channels, and said door structure and the window having cooperating parts to direct water passing through said grille into the lower end of the door structure for passage through said drainage openings.

3. A storm door comprising a hollow door structure having inner and outer door plates, said door plates having openings therethrough, vertical bars extending along each side edge of said openings in each door plate and having channels opening on the inner side of the door, horizontal bars at the upper and lower ends of said openings, an open-work grille secured between said vertical bars, a window mounted upon the inner side of said door structure for pivotal movement and having a frame provided with outwardly projecting flanges adapted to be received in said channels and engaging the inner walls of the channels when the window is closed to prevent the passage of water into said channels, and means carried by the window frame extending outwardly through the opening in the inner door plate and cooperating with said lower horizontal bar to direct water passing through said grille into the lower part of the hollow door structure.

4. A storm door comprising a hollow door structure having inner and outer door plates, said door plates having openings therethrough, vertical bars extending along each side edge of said openings in each door plate and having channels opening on the inner side of the door, horizontal bars at the upper and lower ends of said openings, an open-work grille secured between said vertical bars, a window mounted upon the inner side of said door structure for pivotal movement and having a frame provided with outwardly projecting flanges adapted to be received in said channels and engaging the inner walls of the channels when the window is closed to prevent the passage of water into said channels, said lower horizontal bar having a downwardly and outwardly inclined upper surface, and said window frame having a lower horizontal channel bar receiving said horizontal bar of the door structure when the window is closed and cooperating therewith to direct water passing through the grille into the lower portion of the hollow door structure.

5. A storm door comprising a hollow door structure having inner and outer door plates, said door plates having openings therethrough, vertical bars extending along each side edge of said openings in each door plate and having channels opening on the inner side of the door, horizontal bars at the upper and lower ends of said openings, an open-work grille secured between said vertical bars, a window mounted upon the inner side of said door structure for pivotal movement and having a frame provided with outwardly projecting flanges adapted to be received in said channels and engaging the inner walls of the channels when the window is closed to prevent the passage of water into said channels, said lower horizontal bar having a downwardly and outwardly inclined upper surface, said window frame having a lower horizontal channel bar receiving said horizontal bar of the door structure when the window is closed and cooperating therewith to direct water passing through the grille into the lower portion of the hollow

door structure, a sill bar upon which said door structure is mounted for swinging movement provided in its upper surface with a plurality of outwardly and downwardly inclined drainage channels, and said door structure being provided in its lower end with a plurality of openings for the passage of water from the interior of the door structure into said drainage channels.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

ALFRED H. MILLS.