Nov. 21, 1933. J. S. MURPHY 1,935,887

DOOR

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Fig. 2

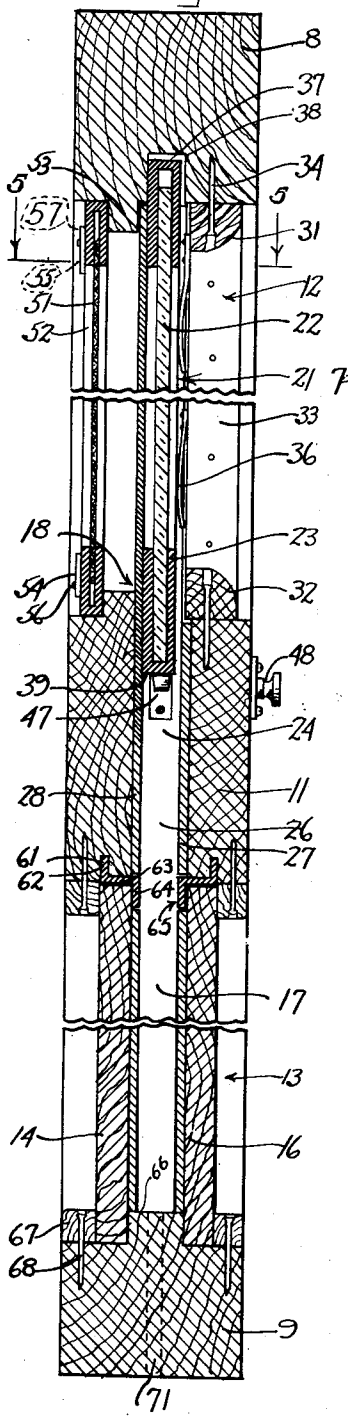
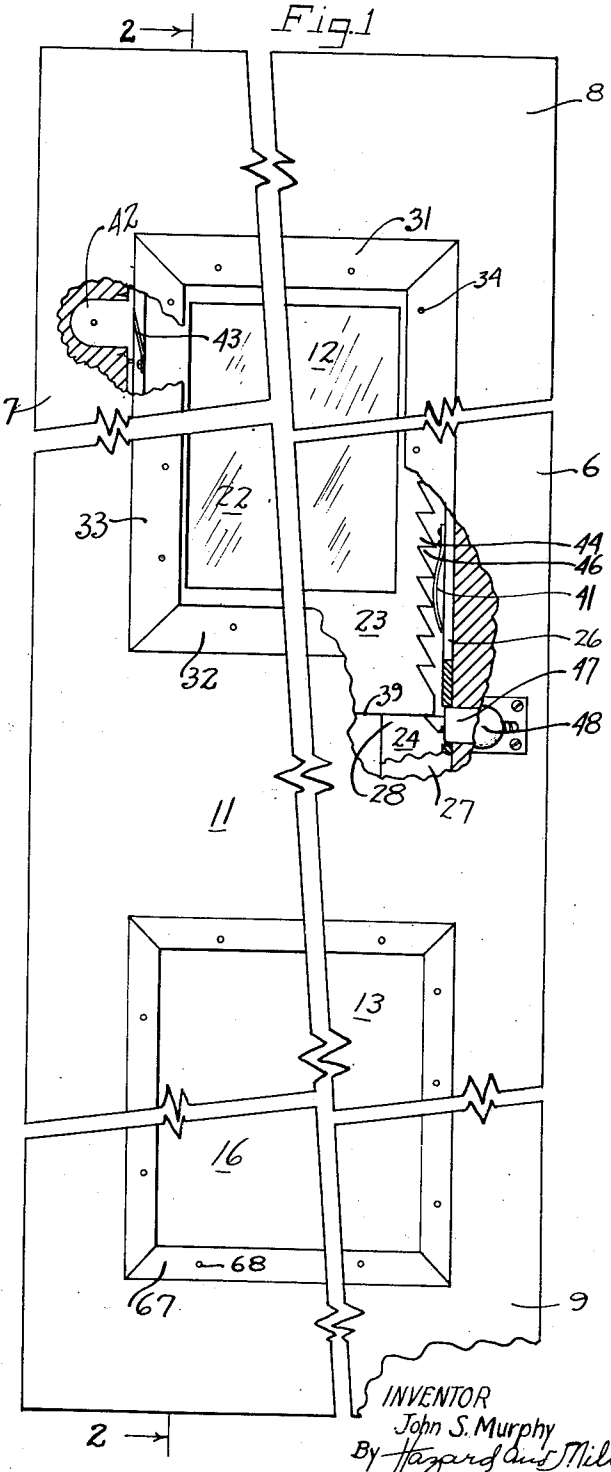


Fig. 1



INVENTOR
John S. Murphy
By Hazard and Miller
Attorneys

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DOOR

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Fig. 3

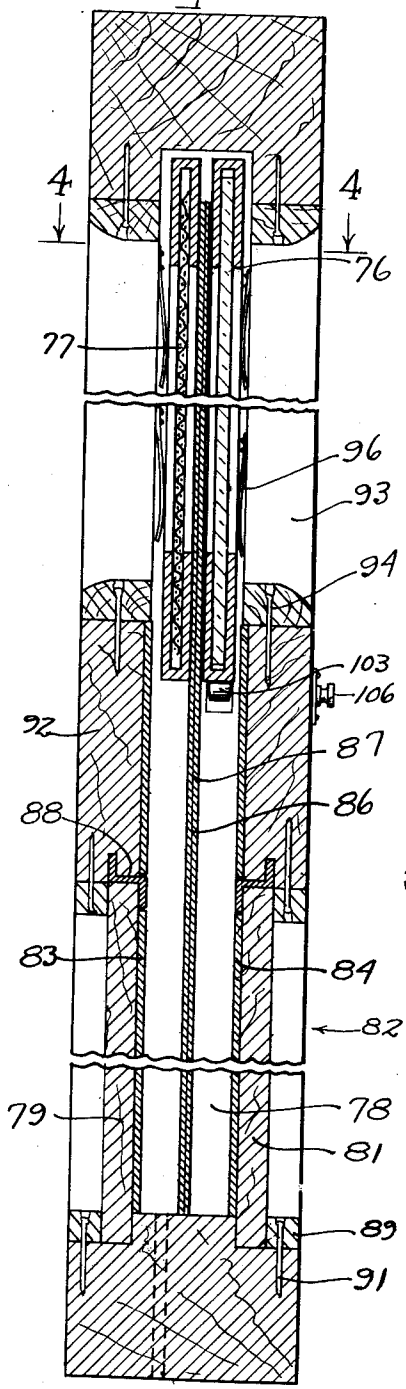


Fig. 4

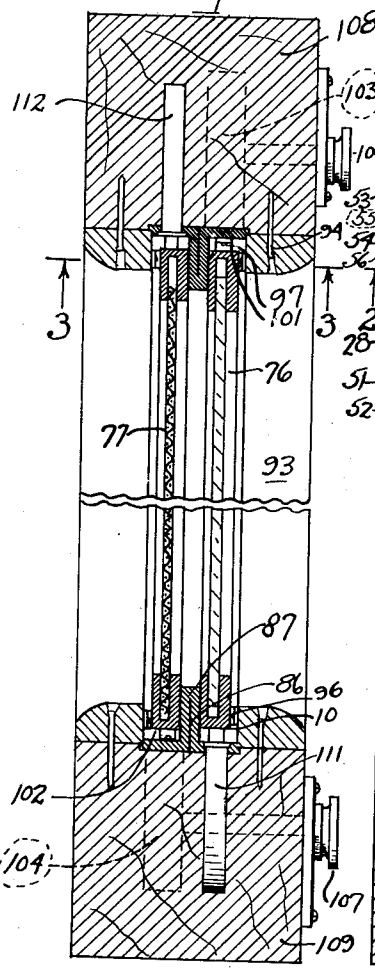
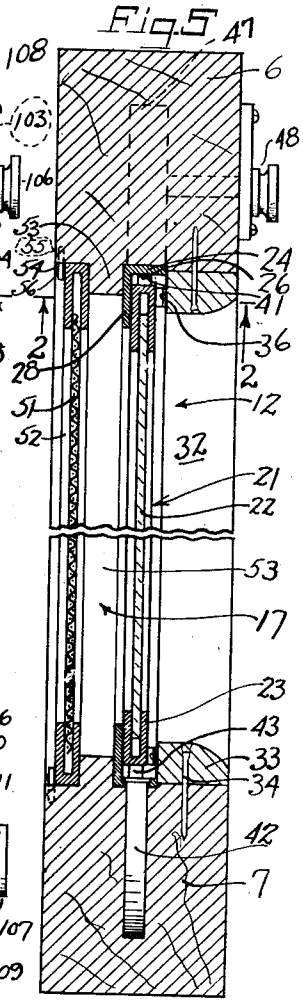


Fig. 5



INVENTOR

John S. Murphy

By Hazard and Miller

Attorneys

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UNITED STATES PATENT OFFICE

1,935,887

DOOR

John S. Murphy, Monterey Park, Calif.

Application December 18, 1930
Serial No. 503,205

7 Claims. (Cl. 20—36)

This invention relates to door constructions, and more especially to that type of door which is known in the trade as an "all-weather" door.

An object of the invention is to provide a door having a window opening in the upper portion thereof and a sash so mounted therein that the sash may optionally be positioned within the opening as a closure therefor or lowered into a pocket which is provided between spaced panels in the lower portion of the door.

Another object is to provide constructional refinements in a door of the general class described, of such a nature that the over-all thickness of the door need be no greater than that of the conventional door wherein the sash is rigidly mounted or hinged.

Another object is to provide, as a modified form of my invention, a door having the above characteristics, and which is provided with a screen which also may be caused to disappear into the pocket in the lower portion of the door, or raised therefrom so as to extend across the opening in the upper portion of the door.

A further object is to provide guiding strips constructed according to novel design, these strips being capable not only of holding the sash and screen frames against movement out of their respective planes of adjustment, but also being capable of operating as inside abutments for the panels holding them in properly spaced relationship, so as to define the pocket into which the sash and door screen may be caused to disappear. This is one of the features of my invention which results in avoiding the necessity of increasing the thickness of the door.

Another object is to provide spring means continually exerting a pressure against the slidable frames, whereby rattling thereof is prevented, and a tight seal is established, especially between the sash frame and the guiding strip within which it is mounted.

A still further object is to provide abutment means for the inner face of each of the panels along its upper edge, this abutment means being in the form of a metal strip of Z-shaped cross section, which is so arranged within the door that it serves also to prevent the liability of moisture leaking downwards through the slot which is provided in the lock rail, and thence into contact with the upper edge of the associated panel.

A still further object is to provide means for releasably retaining the sash frame and the screen frame in selected position with respect to the remainder of the door, and independently of each other.

Another object is to arrange the retaining means for the sash in such a way that it can be released from only the inside of the door, thus making it impossible for a person outside the door to remove the sash and unlock the door by reaching through the window opening.

The invention possesses other objects and advantageous features, some of which, with those enumerated, will be set forth in the following description of the invention's particular embodiments which are illustrated in the drawings accompanying and forming a part of the specification.

Referring to the drawings:

Fig. 1 is a view in side elevation of a door constructed in accordance with the principles of the present invention. In this modification the sash alone is slidably adjustable, the screen frame being preferably permanently mounted in such position that its screen extends across the window opening. Portions of the figure are broken away to reduce its size.

Fig. 2 is a transverse vertical sectional view, the plane of section being taken upon the line 2—2 of Fig. 1, with the direction of view as indicated. Portions of this figure also are broken away to reduce its size.

Fig. 3 is a figure similar to Fig. 2, but showing a slightly modified form of door wherein both the sash frame and the screen frame are capable of being caused to disappear by sliding downwards into a pocket in the lower portion of the door.

Fig. 4 is a horizontal transverse sectional view, the plane of section being taken upon the line 4—4 of Fig. 3, with the direction of view as indicated.

Fig. 5 is a view similar to Fig. 4, but taken upon the line 5—5 of Fig. 2, with the direction of view as indicated.

The door of my invention is of the so-called "all-weather" type, inasmuch as it is provided with a glass sash sq associated with a window opening in the door that the sash may optionally be employed as a closure for the opening or removed therefrom by sliding downwards into a pocket in the lower portion of the door. The window opening is provided with a suitable screen, so that when the sash is removed in this manner from the window opening the door serves the function of the ordinary screen door. Thus, it may be seen that a single door, when constructed in accordance with the principles of the present invention, may be employed in the stead of two doors, namely an ordinary door and a screen

door. The constructional details of the door of the present invention are such that although the sash frame and/or the screen frame may be caused to disappear into a pocket within the door itself, the over-all thickness of the door is not increased over that of the conventional doors previously employed under the same circumstances.

One embodiment of the door of my invention is illustrated upon Figs. 1, 2 and 5. In this door the sash frame alone is vertically adjustable, the screen frame being either permanently mounted within the window opening or hinged or otherwise secured therein but not being capable of being caused to disappear into the door itself.

This door comprises spaced vertical stiles 6 and 7, top and bottom rails 8 and 9 joining the upper and lower ends thereof, respectively, and a center or lock rail 11 intermediate the top and bottom rails 8 and 9, and extending between the stiles 6 and 7. This construction is purely conventional, inasmuch as it is the manner in which most panel doors are constructed. The lock rail 11 divides the space defined by the top and bottom rails and stiles into upper and lower openings 12 and 13, respectively. Whereas the upper opening 12 serves as a window opening within the door, the lower opening 13 is closed by a pair of panels 14 and 16 disposed in spaced parallel relationship, so as to present a pocket 17 therebetween in the lower portion of the door. This pocket 17 communicates with the upper opening 12 through a slot 18 which extends vertically through the lock rail 11, the length of this slot 18 being at least as great as the width of the pocket 17, measured in a direction parallel with the faces of the door.

A sash, indicated in its entirety at 21, and comprising one or more panes 22 of glass or its equivalent suitably mounted within a sash frame 23, preferably of metal, is slidably mounted between the stiles 6 and 7, and is adapted optionally to be moved into the upper opening 12 as a closure therefor or to be caused to disappear into the pocket 17 in the lower portion of the door, thereby leaving the window opening 12 fully opened for the free passage of air therethrough.

The sash 21 is guided within a pair of opposed channel-shaped strips 24, each of which is secured to the inner edge of one of the stiles 6, 7, and extends from the lower edge of the upper rail 8 to the upper edge of the lower rail 9. Each of these channel-shaped strips comprises a bottom 26 and inner and outer side flanges 27 and 28 respectively, extending perpendicularly from the bottom 26. Whereas the outer side flange 28 extends all the way to the lower edge of the upper rail 8, the inner side flange 27 terminates substantially in alinement with the upper edge of the lock rail 11, as best illustrated upon Fig. 2. The purpose of this is to permit insertion and removal of the sash 21, as will readily be understood. After insertion of the sash 21 its inadvertent displacement from the channels 24 is prevented by means of top, bottom and side moldings 31, 32 and 33, respectively, removably secured to the top rail 8, lock rail 11 and stiles 6 and 7, respectively. Any suitable means of attachment may be employed, such, for example, as nails or brads 34. Inasmuch as these moldings 31 to 33 inclusive are readily removable, removal and replacement of the sash 21 may very easily be effected.

In order to prevent rattling of the sash 21, and to establish a tight seal between the sash and the outer flanges 28 of the channels 24, I have provided a plurality of leaf springs 36 secured at spaced intervals along the vertical moldings 33 on those faces thereof which are proximal to the sash 21. These springs operate to press the sash firmly into engagement with the opposite sides of the channels 24, as will readily be understood. Obviously, the sash 21 is of such dimensions that when it is moved into registry with the window opening 12 the upper edge 37 of the sash 21 will seat within a groove 38 formed within the lower edge of the upper rail 8 for the reception thereof, which groove, however, is not deep enough to permit withdrawing the lower edge 39 of the sash 21 from the slot 18 in the lock rail 11. The parts are so proportioned and arranged that the outer edges of the groove 38 and the slot 18 are in alinement with the inner faces of the outer flanges 28 of the channels 24, with the result that the sash 21 will make contact with some portion of the door throughout its entire periphery, so as to establish a tight seal therewith when the sash is moved to closing position. This permits making the channels 24, within which the sash 21 is slidable, wide enough to prevent binding between them and the sash, and allows for swelling of the parts when affected by moisture. However, when the sash frame 23 is constructed of metal, the sash itself is not subject to swelling.

I also employ a plurality of springs 41 between an edge of the sash 21 and the bottom 26 of the associated channel 24, these springs 41 serving to press the sash 21 against the bottom 26 of the opposite channel 24, as best illustrated upon Fig. 5.

The sash is provided with a spring balance 42, preferably of conventional design and having a spring-wound tape or cord 43 secured at one end to an edge of the sash 21, whereby the weight of the sash 21 is counterbalanced to assist in retaining the sash wherever positioned. However, I have found it also desirable to provide a ratch 44 in the form of a plurality of saw-shaped teeth 46 along one edge of the sash 21, preferably that edge thereof opposite the spring balance 42. A spring bolt 47, also preferably of conventional design, is mortised into the associated stile 6, and cooperates with the teeth 46 of the ratch 44, thereby serving as a ratchet to releasably retain the sash 12 in selected degree of vertical adjustment. The handle 48, whereby the ratchet bolt 47 may be retracted, extends through the inner face of the associated stile 6 so as to be operable from the inside of the door only. This is a feature of no small importance, for the reason that there has not been produced previously any door of this general type which could not be opened easily from the outside. For example, most doors of this type can easily be opened by cutting the screen, lifting the sash so as to remove the water table by which it is supported and then permitting the sash to drop into the pocket in the lower portion of the door, and then reaching through the window opening to release the door lock.

The window opening 12 is provided with a screen 51 suitably mounted in a preferably metal frame 52. This frame is preferably removably mounted within the window opening 12, either by means of hinges (not shown) or by being simply set in against abutting beads 53 formed on the rails and stiles and held thereagainst by

a plurality of metal clips 54 pivotally mounted upon the frame 52 by pins 56. These clips are preferably L-shaped, so that they are urged by gravity into that position in which one leg 57 is swung into a notch 55 in the associated rail or stile, as the case might be, and thus hold the screen frame 52 against inadvertent displacement.

The provision of the pocket 17 in the lower portion of the door for the reception of the sash 21 presents a problem in mounting the panels 14 and 16, because of the fact that the thickness of the door is limited by commercial requirements. However, I have been enabled to overcome this difficulty to such an extent that a door constructed as hereinabove described need be of no greater thickness than one and three-eighths (1⅜) inches, this being a standard thickness for doors in common use. I have accomplished this by providing novel interior abutment means for the panels 14 and 16, whereby the panels are retained in properly spaced relationship, so as to define the pocket 17. The side flanges 27 and 28 of each of the channels 24 engage the inner faces of the panels 14 and 16 along their vertical edges, and thus serve as internal abutment means for these edges of the panels. As abutment means for the upper edge of each of the panels I have provided a metal strip 61, which is Z-shaped in cross section, as best illustrated upon Fig. 2. One flange 62 of each strip 61 is rabbeted into the lower edge of the lock rail 11 in such position that it is spaced at a material distance from the plane of the proximal edge of the slot 18 through the lock rail. The central portion 63 of the strip 61 extends horizontally inwards from the lower edge of the flange 62 across the upper edge of the associated panel 14, 16, so as to position the other side flange 64 of the strip 61 in the plane of the associated side flanges 27 or 28, as the case might be, of the channel strips 24, this side flange being cut away, as indicated at 65, to receive the end of the flange 64. Hence, the horizontally extending side flanges 64 of the Z-shaped strips 61 serve as internal abutment means for the upper edges of the panels 14 and 16. The Z strips serve another function, however, inasmuch as they prevent the possibility of any moisture which runs down through the slot 18 of the lock rail 11 from coming into contact with the upper edges of the panels 14 and 16, this being a matter of considerable importance, inasmuch as these panels are frequently constructed of multi-ply material, the several plies being secured together by glue which would be dissolved in the presence of moisture. Inasmuch as each of the strips 61 extends across the upper edge and downwards in engagement with the inner face of one of the panels, any moisture running down through the slot 18 cannot come into contact with the panels until it has passed the extreme upper edges thereof. The abutment means for the lower edges of the panels 14 and 16 is a bead 66 formed on the upper edge of the bottom rail 9. Cooperative with these internal abutment means are stop moldings 67 secured to the inner edges of the stiles 6 and 7, the lower edge of the lock rail 11, and the upper edge of the bottom rail 9, and abutting the outer faces of the panels 14 and 16, so as to hold them securely against the flanges 27 and 28 of the channels, the flanges 64 of the Z strips 61, and the bead 66. Brads 68 or equivalent fastening means are employed to secure the stop moldings 67 in place, thereby permitting removal of the moldings for the purpose of replacing either or both of the panels 14 and 16 whenever desired. It should be observed, however, that the moldings 67, as well as the moldings 33, are disposed entirely inside the limiting planes of the door, i. e., the planes of the inner and outer faces of the rails and stiles. This is a matter of considerable importance, because of the fact that it permits stacking and crating the doors with one superimposed upon another, without danger of damaging them, as would be the case if there were any projecting portions on either door apt to penetrate or otherwise mar the exterior surface of the adjacent door. This feature is made possible by means of the internal abutment means hereinabove described for the panels 14 and 16, as well as by the fact that metal sash 21 is employed, it being understood that a metal sash is materially thinner than one in which the sash frame is constructed of wood.

Another advantage in connection with having the stop moldings 67 disposed completely inside the bounding planes of the door is that is avoids the danger of their entrapping water flowing down the sides of the lock rail 11 for conducting the water inwards into engagement with the upper edges of the panels 14 and 16, as would be the case if they projected outwards beyond the external faces of the lock rail 11. Provision is made for the escape of liquid entrapped within the pocket 17 by flowing downwards thereinto through the slot 18 in the lock rail 11. A plurality of weep holes 71 extends vertically through the bottom rail 9 from the bottom of the pocket 17, as clearly illustrated in broken lines upon Fig. 2.

In the modificaiton of the door of my invention which is illustrated upon Figs. 3 and 4, both the sash 76 and the screen 77 are slidably mounted so as to permit them to be caused to disappear into the pocket 78 which is provided between the panels 79 and 81 which close the space 82 in the lower portions of the door. Whereas the pocket 78 in this modification must be wide enough to accommodate both the sash 76 and the screen 77, thereby necessitating a wider pocket than the pocket 17 provided in the previously described modification, it is possible, by employing the internal stop means of my invention for the panels 79 and 81, to construct the door so that it is no thicker than the conventional one and three-quarters (1¾) inch door.

As in the previously described modification, the internal stop means for the panels 79 and 81 are the side flanges 83 and 84 of channel-shaped guides 86, which in this modification, however, are double channels instead of single channels. Hence, each of the strips forming the channels 86 is substantially W-shaped in cross section, each having an intermediate flange 87 midway between the side flanges 83 and 84. These intermediate flanges 87 of the two opposite double channels 86 serve to keep the sash 76 and the screen 77 separated, thereby permitting facile adjustment of one without affecting the other. Z-shaped strips 88 similar to those described in conjunction with the first modification are employed as stop means for the upper edges of the panels 79 and 81, as clearly illustrated upon Fig. 3; and the external stop means also are in the form of stop moldings 89, removably secured in place by brads 91 or their equivalent.

Both side flanges 83 and 84 of the double channel 86 terminate substantially in alinement with the upper edge of the lock rail 92, inadvertent

removal of the sash 76 and screen 77 being prevented by stop moldings 93 removably secured in place by brads 94 or their equivalent, these moldings taking the place of those portions of the side flanges 83 and 84 which are cut away. Leaf springs 96 are provided upon preferably each of the vertical stop moldings 93 in position to engage the proximal faces of the sash 76 and screen 77 and press them against the intermediate flange 87 of the channel 86, and thereby prevent rattling. In this modification I also prefer to employ the leaf springs 97 interposed between an edge of each of the sash 76 and screen 77 and the bottom of the associated channel, so as to continually press the frames of the sash and screen against the bottom of the opposed channel.

I have also provided in this modification a ratch 101 on a vertical edge of the sash 76, and a ratch 102 on the distal vertical edge of the screen 77, and with these ratches 101 and 102 mortised spring bolts 103 and 104, respectively, cooperate, serving as ratchets whereby the sash 76 and screen 77, respectively, may be releasably retained in selected degree of vertical adjustment. The handles 106 and 107, whereby the ratchet bolts 103 and 104, respectively, may be manually withdrawn, both extend through the inner face of the door, but through different stiles 108 and 109, respectively, as clearly illustrated upon Fig. 4. The sash frame 76 and the screen frame 77 are each preferably provided with a spring balance 111, 112, respectively, to assist in vertical adjustment thereof and in releasably retaining each frame in selected degree of vertical adjustment.

Thus, it may be seen that I have provided a single door which is capable of taking the place of two conventional doors, one of which carries a glass pane and the other of which is a screen door. When it is desired to effectually close the room to which the door of my invention leads, the glass pane 21 or 76, as the case might be, is moved to that position in which it closes the window opening of the door. However, when it is desired to ventilate the room, the sash 21 or 76 may be lowered into the pocket 17 or 78, either partially or completely, depending upon the degree of ventilation required. However, this removal of the sash from the window opening will not permit entrance of insects and the like to the room, because of the presence of the screen, which, however, may be removed if desired, by sliding it downwards into the pocket 78 in the case of the last described modification, or completely removed from the door in the case of the first described modification. Moreover, on account of the details of construction hereinabove described as a portion of my invention, my improved door is capable of presenting these advantages, although it need not be any thicker than the conventional door now manufactured, and not capable of serving the double function of a paneled and a screen door.

It is to be understood that the details of the invention as herein disclosed, are subject to alteration within the spirit or scope of the appended claims.

I claim:

1. In a closure construction, a frame comprising spaced stiles, top and bottom rails and a center rail dividing the space defined by said rails and stiles into upper and lower openings, a pair of panels closing said lower opening and spaced to define a pocket therebetween, said center rail having a slot therethrough from said pocket into said upper opening, a sash slidably mounted between said stiles and adapted to be moved optionally into said pocket or into said upper opening as a closure therefor, and stop means for each of said panels comprising a flanged strip substantially Z-shaped in cross section, one flange of each of said strips being rabbeted into said frame and spaced from the plane of said slot, and the other flange lying substantially flush with the proximal edge of said slot and engaging the inner face of the associated panel.

2. In a closure construction, a frame comprising spaced stiles, top and bottom rails and a center rail dividing the space defined by said rails and stiles into upper and lower openings, a pair of panels closing said lower opening and spaced to define a pocket therebetween, said center rail having a slot therethrough from said pocket into said upper opening, a sash and a screen, each being slidably mounted between said stiles and adapted to be moved independently of the other and optionally into said pocket or said upper opening, and stop means for each of said panels comprising a flanged strip substantially Z-shaped in cross section, one flange of each of said strips beings rabbeted into said frame and spaced from the plane of said slot, and the other flange lying substantially flush with the proximal edge of said slot and engaging the inner face of the associated panel.

3. In a closure construction, a frame comprising spaced stiles, top and bottom rails and a center rail dividing the space defined by said rails and stiles into upper and lower openings, a pair of panels closing said lower opening and spaced to define a pocket therebetween, said center rail having a slot therethrough from said pocket into said upper opening, a sash and a screen, each being slidably mounted between said stiles and adapted to be moved independently of the other and optionally into said pocket or said upper opening, internal stop means for each of said panels comprising a flanged strip substantially Z-shaped in cross section, one flange of each of said strips being rabbeted into said frame and spaced from the plane of said slot, and the other flange lying substantially flush with the proximal edge of said slot and engaging the inner face of the associated panel, and external stop means for each of said panels comprising a molding secured to each of said stiles, bottom rail and center rail and lying entirely inside the planes of the outer faces thereof.

4. A door comprising spaced stiles, top and bottom rails and a lock rail dividing the space defined by said rails and stiles into upper and lower openings, a pair of panels closing said lower opening and spaced to define a pocket therebetween, said lock rail having a slot therethrough from said pocket into said upper opening, a sash slidably mounted between said stiles and adapted to be moved optionally into said pocket or into said upper opening as a closure therefor, and guiding means for said sash comprising a channel-shaped metal strip extending along the inner edge of each of said stiles with an edge of said sash slidably disposed therein, the side flanges of said channel-shaped strips engaging the inner faces of said panels along the vertical edges thereof to serve as inner abutments therefor.

5. A door comprising spaced stiles, top and bottom rails and a lock rail dividing the space defined by said rails and stiles into upper and lower openings, a pair of panels closing said lower opening and spaced to define a pocket there-

between, said lock rail having a slot therethrough from said pocket into said upper opening, a sash frame and a screen frame, each slidably mounted between said stiles and adapted to be moved independently of the other and optionally into said pocket or said upper opening, and guiding means for said frames comprising a double channel-shaped metal strip extending along the inner edge of each of said stiles, each vertical edge of each frame being slidably disposed within one of the channels of one of said strips, a side flange of each of said channel-shaped strips engaging the inner face of one of said panels along a vertical edge thereof to serve as an inner abutment therefor.

6. A door comprising spaced stiles, top and bottom rails and a lock rail dividing the space defined by said rails and stiles into upper and lower openings, a pair of panels closing said lower opening and spaced to define a pocket therebetween, said lock rail having a slot therethrough from said pocket into said upper opening, a sash slidably mounted between said stiles and adapted to be moved optionally into said pocket or into said upper opening as a closure therefor, guiding means for said sash comprising a channel-shaped metal strip extending along the inner edge of each of said stiles with an edge of said sash slidably disposed therein, the side flanges of said channel-shaped strips engaging the inner faces of said panels along the vertical edges thereof to serve as inner abutments therefor, and moldings secured to said stiles, bottom rail and lock rail and engaging the outer faces of said panels to serve as outer abutments therefor, said moldings lying entirely between the planes of the outer faces of said rails and stiles.

7. A door comprising spaced stiles, top and bottom rails and a lock rail dividing the space defined by said rails and stiles into upper and lower openings, a pair of panels closing said lower opening and spaced to define a pocket therebetween, said lock rail having a slot therethrough from said pocket into said upper opening, a sash frame and a screen frame, each slidably mounted between said stiles and adapted to be moved independently of the other and optionally into said pocket or said upper opening, guiding means for said frames comprising a double channel-shaped metal strip extending along the inner edge of each of said stiles, each vertical edge of each frame being slidably disposed within one of the channels of one of said strips, a side flange of each of said channel-shaped strips engaging the inner face of one of said panels along a vertical edge thereof to serve as an inner abutment therefor, and moldings secured to said stiles, bottom rail and lock rail and engaging the outer faces of said panels to serve as outer abutments therefor, said moldings lying entirely between the planes of the outer faces of said rails and stiles.

JOHN S. MURPHY.