

Feb. 18, 1964

G. F. RITTER, JR.  
GLASS DOOR CONSTRUCTION

3,121,261

Filed Feb. 25, 1960

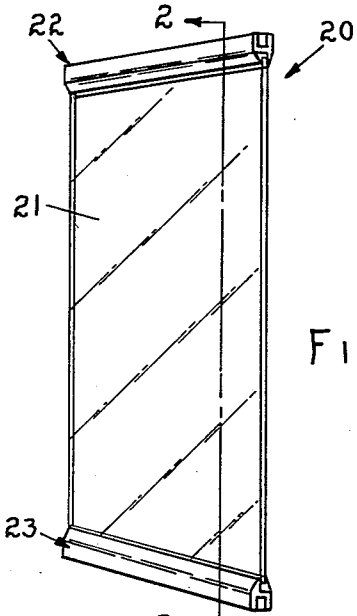


Fig. 1

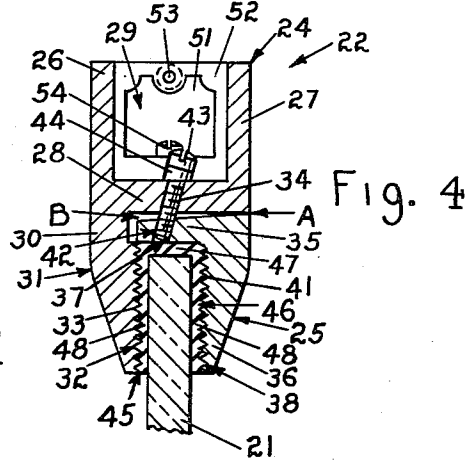


Fig. 4

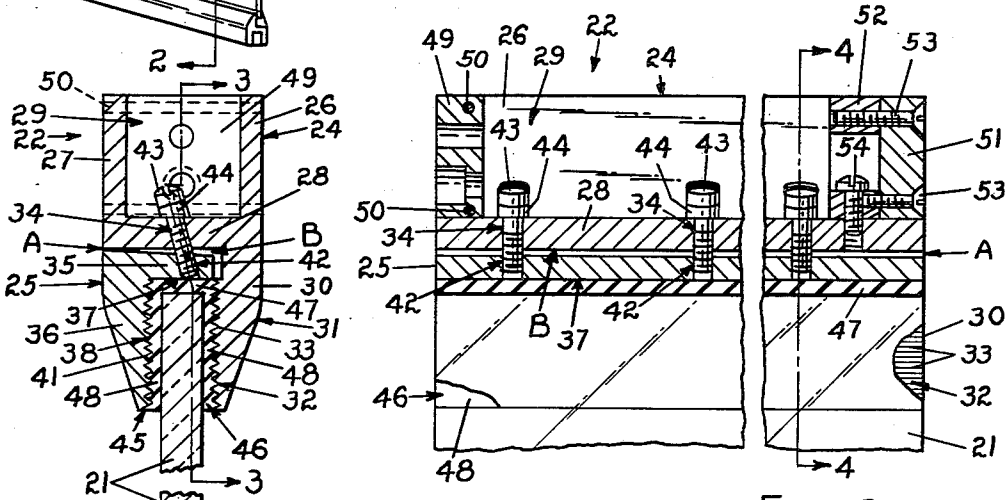


Fig. 3

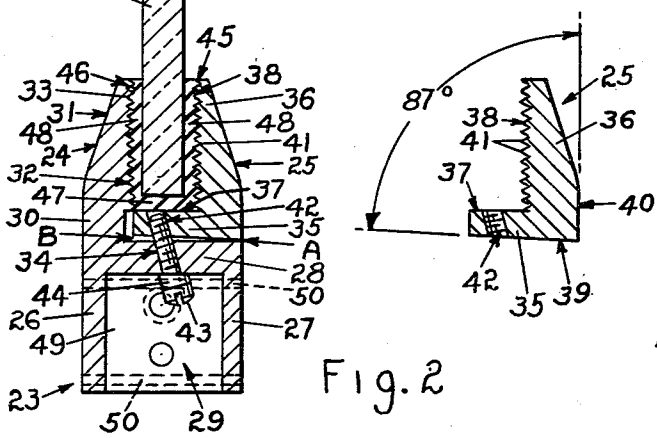


Fig. 2

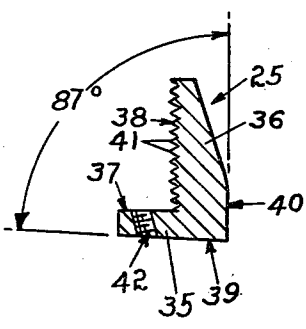


Fig. 5

INVENTOR.  
BY George F. Ritter, Jr.  
Nobbe & Swope  
ATTORNEYS

1

3,121,261

## GLASS DOOR CONSTRUCTION

George F. Ritter, Jr., Toledo, Ohio, assignor to Libbey-Owens-Ford Glass Company, Toledo, Ohio, a corporation of Ohio

Filed Feb. 25, 1960, Ser. No. 10,916  
6 Claims. (Cl. 20—35)

The present invention relates broadly to doors and more particularly to a door construction comprising a glass panel provided with metal sash members along the top and bottom edges thereof.

It is an object of this invention to provide a glass panel door embodying novel metal sash members, each of which includes two interfitting sections, and means for securing the sash sections together in clamping relation to the glass panel.

Another object of the invention is to provide a glass panel door of the above character in which the means for securing the sections of each sash member together and to the glass panel comprises screws which are concealed from view.

Another object of the invention is to provide a glass panel door of the above character in which a resilient gasket is provided at the top and bottom of the glass panel and is interposed between the panel and the two sections of the sash member which clamp the resilient gasket therebetween.

A further object of the invention is to provide a glass panel door of the above character in which the sash sections are so designed and associated with one another as to compensate for the normal shrinkage and/or flow of the resilient gasket.

A further object of the invention is to provide a glass panel door of the above character which may be readily dis-assembled and re-assembled for service at the site of installation.

A still further object of the invention is to provide a glass panel door which is both pleasing in appearance and durable in service.

Other objects and advantages of the invention will become more apparent during the course of the following description, when taken in connection with the accompanying drawings.

In the drawings wherein like numerals are employed to designate like parts throughout the same:

FIG. 1 is a perspective view of a glass door constructed in accordance with this invention;

FIG. 2 is a transverse sectional view taken substantially along line 2—2 of FIG. 1;

FIG. 3 is a fragmentary sectional view taken substantially along line 3—3 of FIG. 2;

FIG. 4 is a fragmentary sectional view taken substantially along line 4—4 of FIG. 3; and

FIG. 5 is a cross-section of the smaller of two sections comprising a sash member.

Referring now to the drawings, and particularly to FIG. 1, the door assembly shown is designated in its entirety by the numeral 20. The door is comprised of a rectangular panel 21, preferably of tempered glass of sufficient thickness and strength to withstand the sustained usage to which a hinged or swinging door is subjected, and metal sash members 22 and 23 along the top and bottom edges of said panel. The door is adapted to be hinged at the left side of FIG. 1 on a suitable hinge mechanism. Other hardware such as push bars, locks, etc., may be provided; however, none of these articles of hardware constitute a part of the invention and for this reason have not been included in the drawings. Also, while the invention is herein illustrated and described in connection with glass panel doors, it will be-

2

come apparent that the novel sash members disclosed may be attached to panels other than door panels and to materials other than glass.

As previously stated, the panel 21 is preferably made of tempered plate glass, which is three to seven times stronger than ordinary plate glass of comparable dimensions. The sash members 22 and 23 are identical in construction and have been designated by individual reference numerals solely for the purpose of identifying one as the top sash member 22 and the other as the bottom sash member 23.

Each sash member 22 and 23 is comprised of a larger section 24 and a smaller section 25, which in assembled relation, combine to form a sash member of channel formation which fits over the top or bottom edge of the glass panel. The two sections 24 and 25 may be extruded, rolled or cast from aluminum, bronze or other suitable metals or alloys thereof.

The larger section 24 includes a pair of legs 26 and 27 extending vertically in spaced, parallel relation and joined at one extremity by a horizontal web 28 to define a hardware receiving channel 29 which is open on the side opposite the web 28 and at both ends. A wall 30 extends from the web 28 to form, with the outside of the leg 26 a continuous surface 31. As shown in FIGS. 2 and 4, the surface 31 is inclined inwardly to gradually reduce the thickness of the terminal portion of the wall 30. The inner surface 32 of the wall 30 is formed with a plurality of serrations 33 extending longitudinally with respect to that surface or horizontally with respect to a mounted door 20. A plurality of holes 34 are drilled, at equal longitudinally spaced intervals, through the web 28 from the hardware receiving channel 29 progressing at an angle of approximately 15° toward the wall 30.

Referring particularly to FIG. 5, the smaller section 25 of each sash member 22 and 23 is substantially L-shaped in cross-section and comprises a base 35 and an upstanding wall 36, with the respective interior surfaces 37 and 38 extending horizontally and vertically to define a right angle and with the respective exterior surfaces 39 and 40 including an angle slightly less than a right angle and preferably of approximately 87°. The exterior angle is made acute by gradually reducing the thickness of the base 35 from the juncture of the exterior surfaces 39 and 40 to the terminus of the base or, in other words, from right to left in FIG. 5. The inner surface of the wall 36 is also provided with longitudinally extending serrations 41. Formed in the base 35 are a plurality of threaded holes 42 spaced at intervals equal to the spacing of the holes 34 in the web 28 of the larger section 24 and extending at the same angle through the base 35 so that when the sections 24 and 25 are associated with one another the holes 34 and 42 are in registry.

When fitted upon an edge of the glass panel, the wall 30 of sash section 24 is located opposite one surface of the glass panel while the wall 36 of sash section 25 is located opposite the other surface of the panel, with the base 35 of sash section 25 being interposed between the peripheral edge of the glass panel and the web 28 of section 24 and secured in place by screws 43 passing through the aligned openings 34 and 42. It will be noted that the base 35 is out of contact with the surface 32 of wall 30 and that the base 35 and the web 28 are in contact only along the line A and are separated by an increasing wedge-shaped gap B. It will be further noted that the surfaces 32, 37 and 38 form a channel 45 relatively wider than the thickness of the glass panel 21. Screws 43, with bias faced washers 44 mounted thereon, are inserted through the clearance holes 34 in

the larger section 24 and engage the threads in the holes 42 in the smaller section 25 so that as the screws 43 are tightened, the smaller section 25 will pivot upon the larger section 24 along the longitudinally extending line A to narrow the channel 45, particularly at the point remote from the pivot line A.

A gasket 46, U-shaped in cross-section and made of a resilient material, such as neoprene, is snugly fitted over each end of the glass panel 21 and is in turn received within the channel 45 of the respective sash member. The base 47 and side walls 48 of the gasket respectively serve as cushions between the peripheral edge of the glass panel and the surface 37 forming the base of the channel 45 and between the sides of the glass panel and the serrated surfaces 32 and 38 forming the side walls of the channel 45.

As the screws 43 are tightened the serrations 33 and 41 bite into the outer vertical surfaces of the gasket 46 thereby compressing the gasket to firmly grip the major surfaces of the glass panel 21. In the final stages of tightening, the material in the gasket exerts a force to slightly spring the smaller section 25. This feature is important, for it is well known that virtually all gasket materials either shrink or flow when subjected to compressive forces and exposure to the atmosphere over prolonged periods of time. Therefore, when the gasket material either shrinks or flows, the smaller section 25 moves with the gasket to maintain gripping pressure upon the surface of the glass panel.

Since most known gasket materials flow when subjected to a compressive force, as exerted by a sash element, it is apparent that without compensating for such flow, the sash members would relax their grip on the panel. This compensation is accomplished by further tightening the screws 43 when the walls 48 of the gasket 46 are fully compressed to slightly spring the smaller or angular section 25 of the sash member.

In addition, the gap B provided between the web 28 of the larger sash section 24 and the base 35 of the smaller sash section 25, permits further tightening of the screws 43 in the event the grip of a sash member upon the surfaces of a glass panel should relax. Furthermore, it is a relatively simple matter to replace a gasket which has lost its resilience or to make other repairs which require dismantling of the door 20.

When the door is assembled, the glass panel 21 is supported horizontally. A gasket 46 and a loosely assembled sash member 22 or 23 are successively fitted onto each end of the panel and pressure is applied to the outer surfaces of the walls 30 and 36 of the sash member by a number of C-clamps thereby compressing the side walls 48 of the gasket 45 to firmly grip the surfaces of the glass panel. The screws 43 are then tightened sufficiently to slightly spring the smaller section 25 of the sash member as above described and the C-clamps are removed leaving the side walls 48 of the gasket in compression and the smaller sash section 25 in tension.

The hardware receiving channels 29 are closed at the inner or left side of FIG. 1, by fittings 49, held in position flush with the ends of the sash member by rivets 50. Hinges are attached to a frame and to the fittings 49 of the top and bottom sash members 22 and 23 to provide a vertical axis for supporting the door 20 for swinging motion between open and closed positions, in the conventional manner. The opposite end of each hardware receiving channel 29 is closed by a plate 51 which is removably fastened to an adaptor 52 within the channel 29 by screws 53. The adaptor is fastened to the web 28 of the larger section 24 of sash member 22 and 23 by a screw 54. When desired the plate 51 may be removed and a lock installed.

Glass doors constructed in accordance with the present invention are protected at their top and bottom edges by an improved two-piece sash member. The smaller section of the sash member is pivoted upon the larger section

on a line A to form a channel which is sufficiently greater in width than the thickness of the glass panel so that a U-shaped gasket may be interposed between the panel and the walls of the channel.

Another important feature is that the door is simple in construction and does not require elaborate aligning fixtures. Therefore, should the sash members relax their grip on the panel due to flow of the gasket material and the gaskets still have a useful life, the door may be removed from its hinges and the screws 43 tightened to secure a rigid assembly. It is also obvious that the gaskets may be replaced at the site of installation of the door when they deteriorate to the point where they have lost their resilience. Furthermore, the screws 43 joining the two sections comprising a sash member together are concealed and do not detract from the appearance of the door.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred embodiment of the same, but that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention.

I claim:

1. In a door construction, a panel, a resilient U-shaped gasket fitted over the upper and lower edges of said panel, and a pair of sash members fitted over said gaskets on said upper and lower edges, each said sash member comprising a pair of interfitting L-shaped sections, said interfitting sections having one pair of corresponding legs disposed in opposed, overlapping relationship and the other pair of corresponding legs disposed in parallel, spaced relationship to form a channel for receiving one of said resilient gaskets therein, one of the L-shaped sections of the sash member being pivoted along a line coincident with the juncture of its legs, and means engaging the opposed overlapping legs for securing the inter-fitted sections together and for moving one section relative to the other to compress said resilient gasket into gripping engagement with the opposite faces of the panel.

2. A door construction as defined in claim 1, in which the legs of the pivoted L-shaped section are joined to define an included interior right angle and an included exterior angle slightly less than a right angle.

3. A door construction, comprising a glass panel, a resilient gasket fitted over the upper and lower edges of said panel, a pair of metal sash members comprised of two sections interfitted with one another, one of said sections including a vertical side wall disposed opposite one face of the glass sheet and a horizontal web disposed opposite the peripheral edge of the panel and spaced therefrom, and the second of said sections having a vertical side wall disposed opposite the other face of the panel and a base portion disposed between the peripheral edge of the panel and the web of said first section, the vertical side wall and base portion of said second section being joined to define an included interior right angle and an included exterior angle slightly less than a right angle, said second section having pivotal engagement with said first section, and fastening screws passing through said web and base portion for securing the sections together and for rocking the second section upon the first section to compress said resilient gasket into gripping engagement with the opposite faces of the glass panel.

4. A door construction, comprising a glass panel, a resilient gasket fitted over the upper and lower edges of said panel, a pair of metal sash members comprised of two sections interfitted with one another, one of said sections including a vertical side wall disposed opposite one face of the glass sheet and a horizontal web disposed opposite the peripheral edge of the panel and spaced therefrom, and the second of said sections having a vertical side wall disposed opposite the other face of the panel and a base portion disposed between the peripheral edge of the panel and the web of said first section, said

5

second section having a pivotal engagement with said first section along a line coincident with the juncture of the vertical side wall and base portion of the second section, and fastening screws passing through said web and base portion for securing the sections together and for rocking the second section upon the first section to compress said resilient gasket into gripping engagement with the opposite faces of the glass panel.

5. A door construction, comprising a glass panel, a resilient gasket fitted over the upper and lower edges of said panel, a pair of metal sash members, each including a first section comprising a vertical side wall disposed opposite one face of the glass panel and an integral horizontal web disposed opposite the peripheral edge of the panel and spaced therefrom and a second section having a vertical side wall disposed opposite the other face of the panel and an integral horizontal base portion disposed between the peripheral edge of the panel and the web of the first section, the second section pivoting upon the web of the first section along a line at the juncture of the side wall and base portion of said second section,

6

while the inner end of the base portion is of reduced thickness and spaced from both the vertical side wall and the web of the first section, and fastening screws passing through said web and base portion for securing the sections together and for pivoting the second section upon the first section to grip the resilient gasket between the vertical side walls of said sections.

6. A door construction as defined in claim 5, in which the fastening screws pass through the said web and base portion of the first and second sections respectively at an angle other than a right angle with respect thereto.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

15	2,228,358	Lowry	Jan. 14, 1941
	2,565,200	Burress	Aug. 21, 1951
	2,605,869	Backman	Aug. 5, 1952

##### FOREIGN PATENTS

20	591,168	Great Britain	Aug. 8, 1947
	1,137,170	France	Jan. 7, 1957