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PIVOTAL DOOR CONSTRUCTION AND METHOD

Filed Dec. 21, 1964

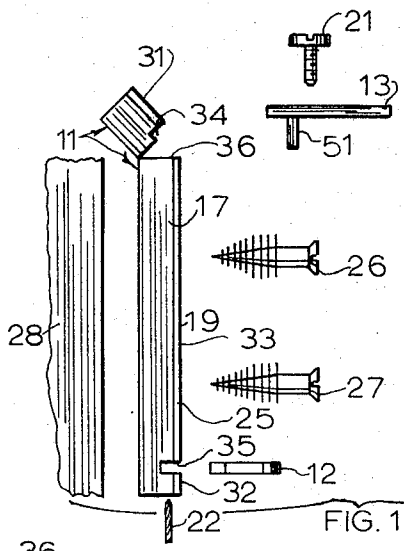
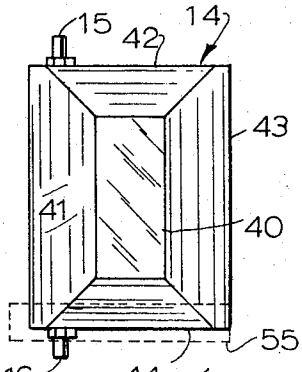


FIG. 1



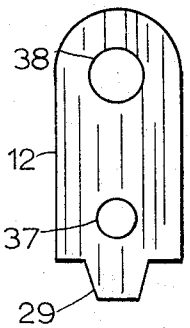


FIG. 5

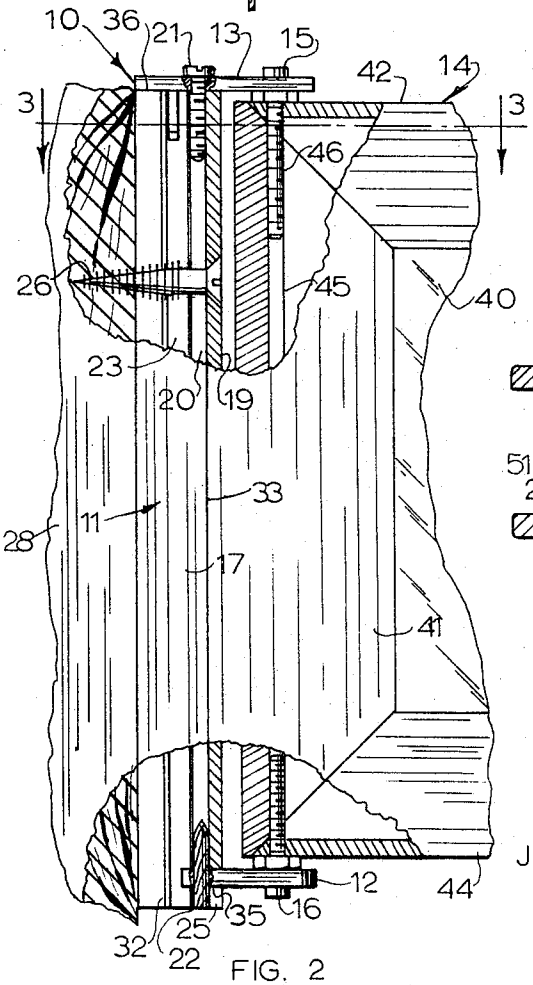


FIG. 2

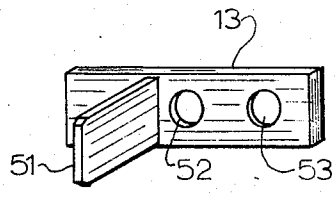


FIG. 4

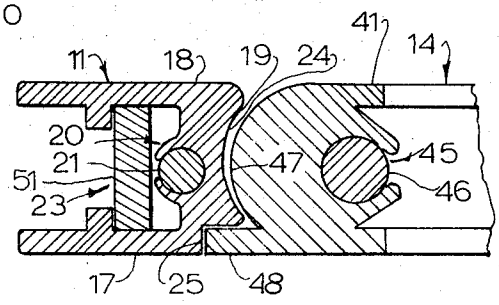


FIG. 3

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PIVOTAL DOOR CONSTRUCTION AND METHOD

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This invention relates to a novel pivotal construction for gates and doors. In particular, this invention provides a sturdy and easy to install pivotal connection between a gate or door and an upright post-like jamb support therefor, said pivotal construction being especially desirable for tub and shower enclosures.

In the bathroom fixture industry, a pivotal door is commonly installed into the doorway opening of a tub or shower enclosure. The typical shower door structure comprises a thin translucent rectangular pane securely bounded by four channeled rail frames, the respective frames intersecting one another in a bevelled-corner relationship. The shower door is then pivotably connected to a post-like jamb uprightly supported along one side of the doorway opening. The bathroom fixture industry has generally employed conventional two-plate hinges, comprising two perforate plates revolvably attached to an intervening hinge pin, as the means for pivotably connecting the shower door to the upright post-like jamb.

While the conventional two-plate hinge is admirably well suited both functionally and economically in the preponderance of door constructions, this general suitability does not extend to tub and shower enclosures. For example, because a continuous flow of water is directed from a shower head toward the pivotal connection between the shower door and its post-like jamb, the juncture of the shower door and its jamb should be substantially leak-proof. However, heavy-duty hinges do, by virtue of the plate thickness, physically separate the shower door from its jamb. Further, this physical separation limits the aesthetic appeal of a shower door construction, the trend in the bathroom fixture industry being to beautify the various fixtures. When two-plate hinges are employed, there is an inherent limitation in the designability of aesthetically attractive jambs and doors without impairment of the pivotal relationship therebetween.

Another disadvantage of the two-plate hinge in the bathroom fixture trade resides in that it is extremely difficult for a lone operator to install a high quality pivotal connection wherein the jamb and the adjacent upright door frame are parallel as well as vertical. Further, the bottom frame of the door must be installed a prescribed distance from and parallel to the base of the doorway. This is because there is a "gutter plate" along the bottom of the door, either attached to the doorway floor or to the bottom door frame, to prevent water leakage from the bottom. It must be remembered that the lone installer is not only an economic necessity in the trade, but also, there is only so much room available in the average bathroof for installation personnel. Because typically employed shower doors are quite thin (about ½ inch) yet large and heavy, it is practically impossible for a lone installer, utilizing a plurality of two-plate hinges, to install the door in the required horizontal and vertical relationship to a previously installed upright jamb. Consequently, it is accepted procedure for the jamb and door to be pivotably connected with two-plate hinges beforehand in the shower door factory, and then for the lone installer to uprightly attach the post-like jamb component along one side of the doorway opening. However, this factory assembled structure is likewise large and heavy, and is therefore, quite cumbersome for one man to handle. It is almost as awkward for the lone installer to attach the post-like jamb so that it is in the required horizontal and vertical position as it would be to pivotably connect the door to a previously positioned upright jamb utilizing conventional two-plate hinges. Further, when such factory-assembled structures are employed, a double inventory must be carried so that the door can be mounted in either right-hand or left-hand fashion, depending upon the layout of the bathroom site.

It is accordingly an object of the present invention to provide a pivotal door construction that may be installed within a doorway opening without the use of two-plate hinges.

It is another object of the present invention to provide a pivotal door construction that is especially adaptable to the bathroom fixture industry wherein it is economically and practically desirable that the door jamb be first vertically or uprightly positioned, and that the door be subsequently pivotably connected to the previously positioned jamb.

It is another object of the present invention to provide a pivotal door construction that may be easily and quickly installed by but one operator on location.

It is yet another object of the present invention to provide a pivotal door construction wherein there is minimal space between the jamb and door so as to result in a leak-proof and aesthetically appealing structure.

It is still another object of the present invention to provide an upright post-like door jamb from which a door may be pivotally hung in either a left-hand or right-hand fashion, said jamb automatically and inherently maintaining said pivotal door a prescribed distance above the base of the doorway.

It is a further object of the present invention to provide a shower door that may be readily measured and positioned along one side of the shower enclosure doorway without the necessity of simultaneously handling both the door and jamb.

These and other objects and advantages are accomplished by means of a novel elongate door jamb, said jamb including an integrally attachable lower tab and an integrally attachable upper terminal plate, said tab and plate having outward extensions toward a door, the door being revolvably supported by the tab and plate outward extensions.

In the drawing, which illustrates the preferred embodiment of the present invention, and in which like numbers refer to like parts in the several views:

FIGURE 1 is an exploded view of the pivotal door construction of the present invention, this exploded view being particularly appropriate to illustrate the preferred method of assembling the several parts of the pivotal door construction.

FIGURE 2 is a side elevational detail view of the pivotal door construction of the present invention, with portions of the shower door frame and the jamb broken away to show constructional details.

FIGURE 3 is a sectional view of the pivotal door construction taken along line 3—3 of FIGURE 2.

FIGURE 4 is a perspective view of the terminal plate component of the pivotal door construction.

FIGURE 5 is a top plan view of the lower tab component of the pivotal door construction.

As can best be seen in FIGURES 1 and 2, the pivotal door construction **10** of the present invention comprises an upright elongate jamb **11**. Jamb **11** is integrally provided with a lower tab **12** and an upper terminal plate **13**, said tab **12** and plate **13** extending outwardly of said jamb **11** toward an upright door **14**. Door **14** is preferably pivotably connected to the outward extensions of lower tab **12** and terminal plate **13**.

Upright elongate jamb **11** comprises an elongate bar having two opposed side panels **17** and **18** and an intervening front panel **19**, said three panels being joined

together in a substantially U-shaped relationship. The interior cross-sectional shape of jamb **11** includes two constricted portions, the first constriction **20** being nearer to the jamb front panel **19**. First constriction **20** is preferably of arcuate shape and must have a peripheral or circumferential length of at least 210 degrees so as to be adapted to securely engage a cylindrical fastener e.g. **21** and **22**, internally along jamb **11**. The second constriction **23** is located nearer to the open end of said U than is first constriction **20**. The exterior contour of elongate jamb **11** preferably includes a curvilinearly concave face **24** for the intervening front panel **19** and a longitudinal recess **25** at the juncture of front panel **19** and a side panel **17**. The elongate jamb **11** has at least two perforations through the front panel **19** thereof for accommodation of fastener screws **26** and **27**, these two screws being utilized to vertically attach jamb **11** along one side **28** of an open doorway.

As can best be seen in FIGURE 1, the elongate jamb **11** initially possesses three segments including two short terminal segments **31** and **32** separated from an intervening major medial segment **33** by two deep notches **34** and **35** in the front panel **19**. The length of the major medial segment **33** is substantially equivalent to the height of vertical frame **41** of shower door **14**. The lengths of the shorter terminal segments are approximately equal and are substantially equivalent to that height to which the bottom of door **14** is to be maintained above the doorway floor; normally this height is about 5/8 inch. There is commonly a water-proof "gutter plate" along the bottom of shower door **14**, said gutter plate being attached to the doorway floor, or preferably as a plate **55** attached to the door itself, as shown in dotted line in FIGURE 1. Before the jamb **11** is vertically attached along doorway **28**, one of the terminal segments e.g. **31**, is physically removed from jamb **11**. Then, jamb **11** is attached along doorway **28** with the remaining terminal segment **32** being at the bottom of the doorway to ultimately act as a spacer between the bottoms of the doorway and the shower door **14**. Top edge **36** of medial segment **33** provides the upper terminus of jamb **11**. In the drawing, door **14** pivots rightwardly of jamb **11**. If a leftward pivot were desired, then segment **32** (rather than **31**) would be physically removed, jamb **11** would be inverted so that remaining segment **31** is downward, and jamb **11** would be attached to the opposite vertical side of the open doorway. Thus, the three-segment jamb **11** has dual-purpose applicability for both left handed and right handed pivoted door constructions.

Also before jamb **11** is vertically attached, the pointed end **29** of lower tab **12** is inserted into notch **35** between medial segment **33** and the remaining terminal segment **32**. Lower tab **12** is integrally connected to first constriction **20** of jamb **11** by means of a self tapping cylindrical fastener **22** passing through perforation **37** of lower tab **12**. Pointed end **29** fits snugly within second constriction **23**, so as to prevent rotation of lower tab **12** within jamb **11**. A portion of lower tab **12** including perforation **38** extends outwardly of jamb **11** toward upright door **14**.

While any type of upright door may be employed, a frame type shower door will be described because the pivotal door construction of the present invention has special installation advantages in the tub and shower trade. Whatever upright door is employed, it is extremely desirable to provide a pivotal relationship between the door **14** and with the outward extensions of lower tab **12** and upper terminal plate **13**. This pivotal relationship may be conveniently provided in one of two ways. For example, as is shown in the drawing, the door **14** may be provided with two integral vertical door pins, one pin **15** at the top and the other **16** at the bottom of the vertical door frame **41** immediately adjacent to jamb **11**; these two pins are revolvably surrounded by

perforations **38** and **53**, in the outward extensions of lower tab **12** and terminal plate **13**, respectively. Another equivalent manner is to provide two perforations into the adjacent door frame **41**, one at the top and the other at the bottom, and to provide the door pins integral with imperforate outward extensions of lower tab **12** and terminal plate **13**, the door pins being revolvably surrounded by perforations in vertical frame **41**.

That manner of pivotal relationship between shower door **14** and the outward extensions of tab **12** and plate **13**, as shown in the drawing, does employ door pins **15** and **16** integral with vertical frame **41**. The typical shower door structure **14** shown in the drawing comprises a translucent rectangular pane **40** securely bounded by four channelled rail frames **41**, **42**, **43**, and **44**, including vertical frames **41** and **43** and horizontal frames **42** and **44**. The respective frames intersect one another in a bevelled-corner relationship. Because the channelled rail frames in a shower door are commonly extruded from aluminum or other metal, it has been found advantageous to include within the extruded shape of adjacent vertical frame **41** an internal constriction **45** adapted to accommodate the door pins **15** and **16**. The type of door pins **15** and **16** shown in the drawing are integrally attacher to the head of a threaded bolt **46**. Thus, the door pins **15** and **16** are simply integrally attached to adjacent vertical frame **41** by means of secure engagement of the threaded bolt shank with frame constriction **45**.

If the exterior contour of jamb **11** includes a curvilinearly concave face **24**, it is desireable to include a curvilinearly convex face **47** within vertical frame **41**, so that frame **41** and jamb **11** are similarly mated as the door **14** is pivoted about jamb **11**. This convex-concave relationship does permit an extremely close spatial relationship between jamb **11** and adjacent door frame **41**. The exterior contour of vertical frame **41** also preferably includes a flange-like projection **48** that fits into longitudinal recess **25** when door **14** is in the closed position. Flange-like projection **48** being on the interior of the shower enclosure, it does inhibit water leakage from the shower spray through the juncture of jamb **11** and door **14**. For the following two reasons, it is desirable that flange-like propection **48** fit wholly within recess **25** and flush with side panel **17**. Firstly, to provide an aesthetically pleasing appearance from the interior of the shower stall. Secondly, in that a "gutter plate" **55**, shown in dotted line in FIGURE 1, may be very simply mounted along bottom horizontal door frame **44**, said "gutter plate" **55** extending beyond vertical frame **41** and vertical jamb **11**. If the flange-like projection **48** is flush with side panel **17**, the "gutter plate" need not be notched to accomodate projection **48**.

As can best be seen in the FIGURE 4 perspective view, upper terminal plate **13** includes a tongue portion **51** as an integral part thereof. There are two perforations in terminal plate **13**, including first perforation **52** near to tongue **51** and second perforation **53** more remote from tongue **51**. Terminal plate **13** is attached to the upper end of attached jamb **11** at the upper terminus **36** of medial segment **33**. Tongue **51** of terminal plate **13** fits downwardly between first constriction **20** and second constriction **23** of jamb **11**; elongated fastener screw **21**, passing through plate perforation **52** and threadedly engaged by first constriction **20**, together with tongue **51** rotationally fix plate **13** with respect to jamb **11**. That portion of terminal plate **11** which extends outwardly toward door **14** includes perforation **53**. Perforation **53** revolvably surrounds top door pin **15**, thus holding shower door **14** adjacent to terminus **36** of jamb **11**.

The method for installing the pivotal door construction is as follows: First, depending upon whether a right hand or left hand door connection is desired, the appropriate terminal segment, **31** or **32**, is removed from the originally provided tri-segment jamb. Then, the pointed end

29 of tab 12 is inserted into the remaining notch, 34 or 35, at the juncture of the jamb major medial segment 33 and the remaining terminal segment. Screw 22 is threaded along the first constriction 20 of the remaining terminal segment until said screw passes through perforation 29 of lower tab 12, thus holding lower tab 12 securely within jamb 11. Next, jamb 11 is attached in upright vertical fashion along vertical doorway 28 by means of screws 26 and 27 passing through perforations of jamb front panel 19; lower tab 12 is at the bottom of the doorway while the exposed end 36 of medial segment 33 is at the top of the doorway.

Then, the bottom door pin 16, integral with shower door vertical frame 41, is inserted through perforation 38 located in the outward extension of lower tab 12. Next, top door pin 15, also integral with door frame 41, is inserted through perforation 53 in top terminal plate 13. Then the tongue 51 of top terminal plate 13 is inserted downwardly between jamb constrictions 20 and 23. Screw 21 is inserted into perforation 52 of plate 13 and threaded along constriction 20, thus holding terminal plate 13 tightly against the top end of jamb 11 which coincides with the exposed terminus 36 of major medial segment 33.

While it is preferred to attach the shower door by means of door pins to the terminal plate 13 and the lower tab 12 that extend outwardly of jamb 11, it is also permissible to attach the plate 13 and tab 12 to the door 14 and to pivotably attach these to the jamb. To do so would require pivot pins in the jamb, preferably being driven along jamb constriction 20 so as to intersect perforations in the terminal plate 13 and lower tab 12.

From the foregoing, the construction and operation of the pivotal door construction will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown, and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

I claim:

1. A pivotal door construction comprising:

(A) An upright bar-like elongated jamb comprising two opposed side panels and an intervening front panel, said three panels being integrally joined together in a U-shaped relationship, said three panels being of appropriate cross-sectional shape whereby the internal cross-section of said U-shaped elongate jamb adjacent to the front panel includes a constricted portion adapted to securely engage an elongate fastener internally along said elongate jamb, said upright elongate jamb front panel being deeply notched near the bottom of said jamb, said jamb including an integrally connected tab within the front panel notched portion of said jamb, said tab intersecting the jamb front panel, a portion of said tab extending outwardly of said jamb toward said door,

(B) a terminal plate connected to the top end of said elongate jamb by means of a fastener surrounded by the jamb constricted portion, a portion of said terminal plate extending outwardly of said jamb toward said door, and

(C) an upright door pivotably connected to the integral tab and terminal plate of said upright elongate jamb by means of a pair of vertical pins extending vertically from said vertical door adjacent to the upright jamb, one of said pins being disposed at the bottom of said door and another of said pins being disposed at the top of said door.

2. A pivotal shower door construction comprising:

(A) An upright bar-like elongate jamb comprising two opposed side panels and an intervening front panel, said three panels being integrally joined together in a U-shaped relationship, said front panel being of appropriate cross-sectional shape whereby

the internal cross-section of said U-shaped elongate jamb includes a constricted portion adopted to securely engage an elongate fastener internally along said elongate jamb, said upright elongate jamb front panel being deeply notched near the bottom end of said jamb, said jamb including an integrally connected tab within the front panel notched portion of said jamb, said lower tab intersecting the jamb front panel, a perforate portion of said tab extending outwardly of said jamb toward said door,

(B) A terminal plate connected to the upper end of said elongate jamb by means of a fastener securely engaged by the jamb constricted portion, a perforate portion of said terminal plate extending outwardly of said jamb toward said door, and

(C) An upright door pivotably connected to the integral tab and terminal plate of said upright elongate jamb, said vertical door having a pair of vertical integral pins extending vertically from said vertical door adjacent to the upright jamb, one of said integral pins being disposed at the bottom of said door and another of said integral pins being disposed at the top of said door, the top door pin being revolvably secured by the perforate portion of the upper terminal plate, the bottom door pin being revolvably secured by the outwardly extending perforate portion of the lower integral tab.

3. A pivotal shower door construction comprising:

(A) An upright bar-like elongate jamb comprising two opposed side panels and an intervening front panel, said three panels being integrally joined together in a U-shaped relationship, said three panels being of appropriate cross-sectional shape whereby the internal cross-section of said U-shaped elongate jamb includes two constricted portions, the first of said constricted portions being within the front panel and the second of said constricted portions being located nearer to the open end of said U, said upright elongate jamb including a tab nearer to the lower end thereof, said tab intersecting the jamb front panel and integrally connected to the jamb by means of an elongate fastener passing through said lower tab and being securely engaged by said first constricted portion, a perforate portion of said lower tab extending outwardly of said jamb toward said door,

(B) A terminal plate connected to the upper end of said elongate jamb by means of a fastener securely engaged by the jamb first constricted portion, said terminal plate including an integral tongue portion disposed downwardly between the first and second constricted portions of said jamb, a perforate portion of said terminal plate extending outwardly of said jamb toward said door, and

(C) An upright door pivotably connected to the integral tab and terminal plate of said upright elongate jamb, a vertical frame adjacent to the jamb of said upright door being provided with a pair of integral door pins, one of said door pins being disposed at the bottom of said door and another of said integral door pins being disposed at the top of said door, the top door pin being revolvably secured by the outwardly extending perforate portion of the terminal plate, the bottom door pin being revolvably secured by the outwardly extending perforate portion of the lower integral tab.

4. A hinged shower door construction comprising:

(A) An upright bar-like elongate jamb comprising two opposed parallel side panels and an intervening front panel, said three panels being integrally joined together in a U-shaped relationship,

(i) the exterior contour of said unitary jamb being curvilinearly concave along said intervening front panel, said front panel being provided with at least two perforations along the length

thereof, the exterior contour being longitudinally recessed along the juncture of a side panel and said curvilinearly concave intervening front panel,

(ii) said three panels being of appropriate cross-sectional shape whereby the internal cross-section of said U-shaped elongate jamb includes two constricted portions, the first of said constricted portions being within the front panel and the second said constricted portions being located nearer to the open end of said U,

said upright elongate jamb including a tab nearer to the lower end thereof said tab intersecting the jamb front panel and being integrally connected to the jamb by means of fatsener intersecting said lower tab and being securely engaged by said first constricted portion, a perforate portion of said lower tab extending outwardly of said jamb toward said door,

(B) A terminal plate connected to the upper end of said elongate jamb by means of a fastener threadedly engaged with the jamb first constricted portion, said terminal plate including an integral tapered tongue wedged downwardly between the first and second constricted portions of said jamb, a perforate portion of said terminal plate extending outwardly of said jamb toward said door, and

(C) An upright door pivotably connected to the integral tab and terminal plate of said upright elongate jamb, said vertical door comprising a thin rectangular panel securely bounded by four channelled rail frames, the cross-section of the vertical door frame adjacent to the jamb comprising two opposed parallel side panels and an intervening front panel, said three panels being integrally joined together in a U-shaped relationship,

(i) the exterior contour of said adjacent vertical door frame being curvilinearly convex along said intervening front panel, the exterior contour including a finger-like projection along the juncture of a side panel and said curvilinearly convex intervening front panel whereby when the door is closed, the finger-like projection extends into the longitudinal recess of said upright jamb,

(ii) The interior contour of said adjacent vertical door frame, including a constricted portion within the front panel so adapted to securely engage a rod-like fastener internally along said adjacent vertical door frame, and

(iii) a pair of door pins integrally with said adjacent vertical door frame, said door pins being securely engaged by the constricted portion thereof, one of said door pins being disposed at the bottom of said door and another of said integral door pins being disposed at the top of said door, the top door pin being revolvably secured by the outwardly extending perforate portion of the terminal plate, and the bottom door pin being revolvably secured by the outwardly extending perforate portion of the lower integral tab.

5. The method of installing a pivotal shower door into the doorway of a shower stall, said method comprising:

(A) Removing a terminal segment of a bar-like elongate jamb said jamb comprising two opposed side panels and an intervening front panel, said three panels being integrally joined together in a U-shaped relationship, said bar-like jamb being of appropriate cross-sectional shape whereby the internal cross-section thereof includes a constricted portion adjacent to the front panel that is adapted to securely engage an elongate fastener internally along said elongate jamb, said elongate jamb front panel being deeply notched near each of the two jamb termini so as to define two short terminal segments and a major medial segment for said elongate jamb,

(B) Vertically attaching said segmentized elongate jamb along one side of said doorway, so that the remaining terminal segment is located beneath the major medial segment and in abutment with the bottom of the doorway,

(C) Attaching a tab to said jamb front panel at the juncture of said medial segment and remaining terminal segment, a portion of said tab extending outwardly of said jamb toward said door,

(D) Fitting an upright door into said tab, said upright door having an integral pair of vertical door pins, one of said door pins being disposed at the bottom of said door, and another of said door pins being disposed at the top of said door, the bottom integral door pin being inserted into the outwardly extending perforate portion of said lower tab so that said lower tab revolvably secures said bottom door pin, and

(E) Connecting a terminal plate across the remaining top end of the segmentized elongate jamb, said terminal plate being held against said remaining top end by means of a fastener surrounded by the jamb constricted portion, said terminal plate including a perforate portion extending outwardly of said jamb toward said door and revolvably surrounding said top door pin.

6. The hinged shower door construction of claim 4 wherein the four channelled rail frames of the upright door include a bottom horizontal door frame and wherein a gutter plate member is mounted along said bottom horizontal door frame, said gutter plate member extending beyond that vertical door frame adjacent to the jamb and toward said jamb.

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