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2,331,822

FOLDING CLOSURE FOR RECESS TUB SHOWER BATH

Filed Dec. 6, 1938

3 Sheets-Sheet 1.

Fig. 1.

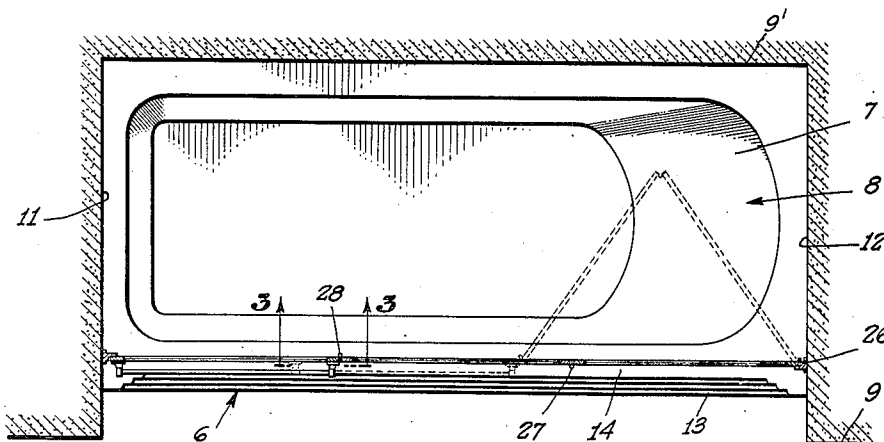
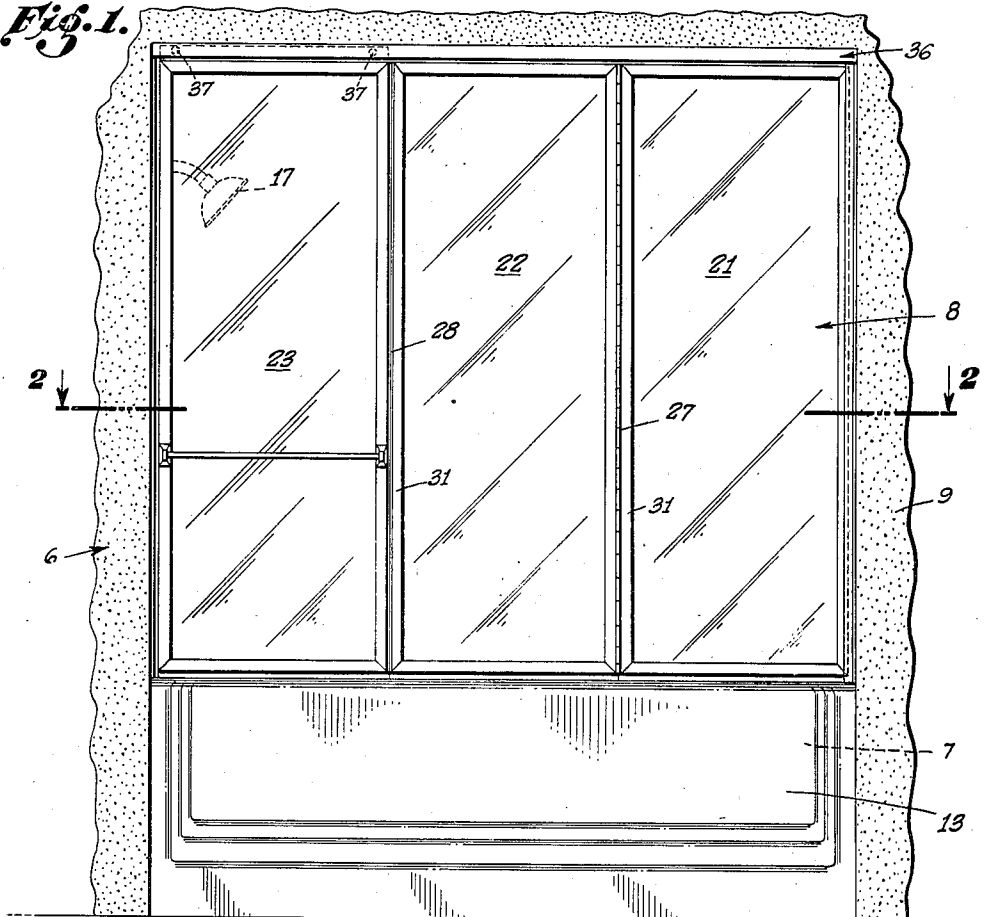


Fig. 2.

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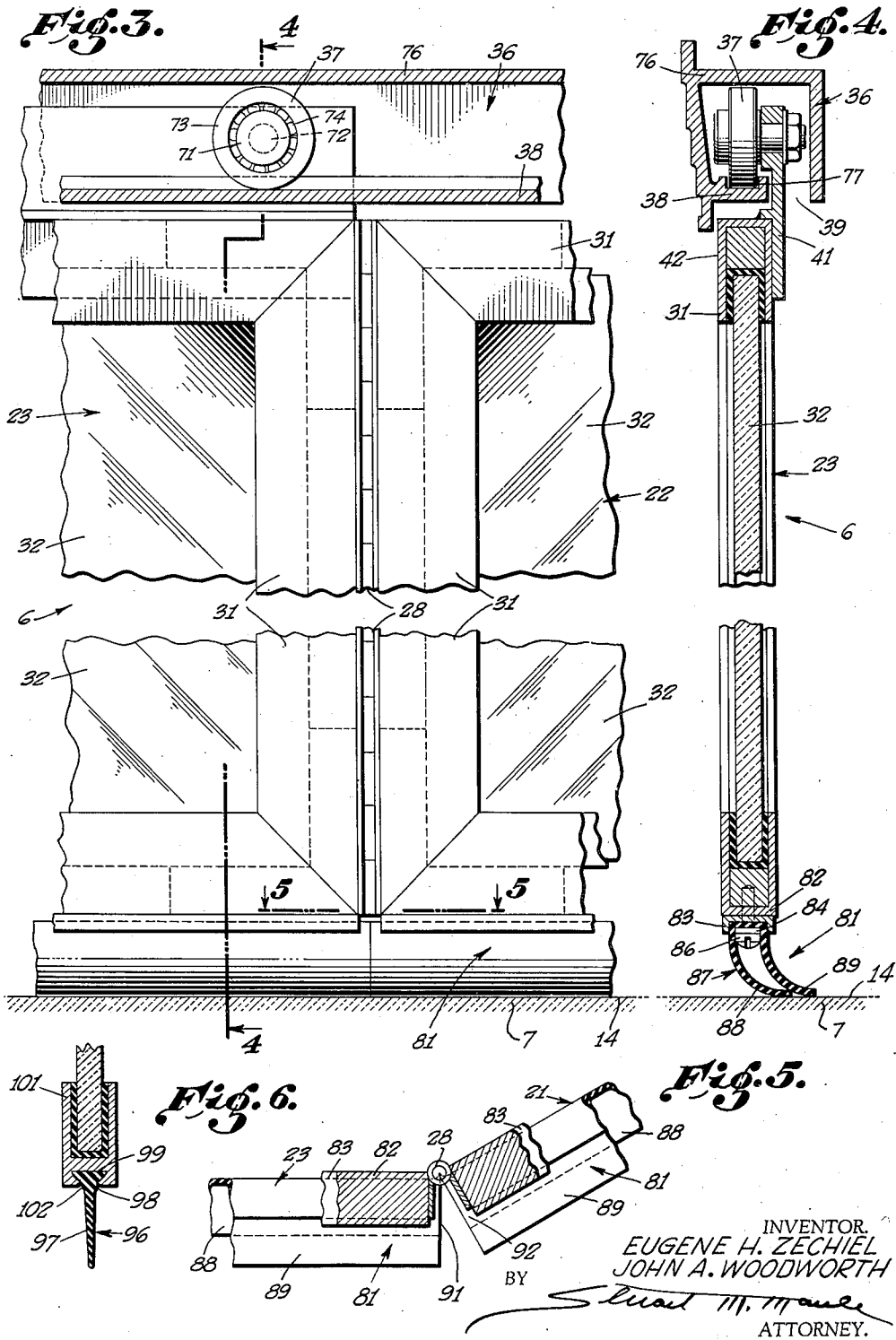
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

Fig. 7.

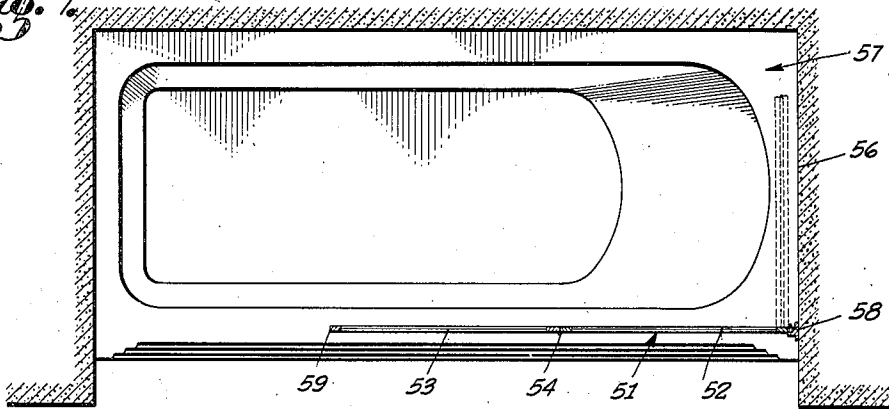


Fig. 8.

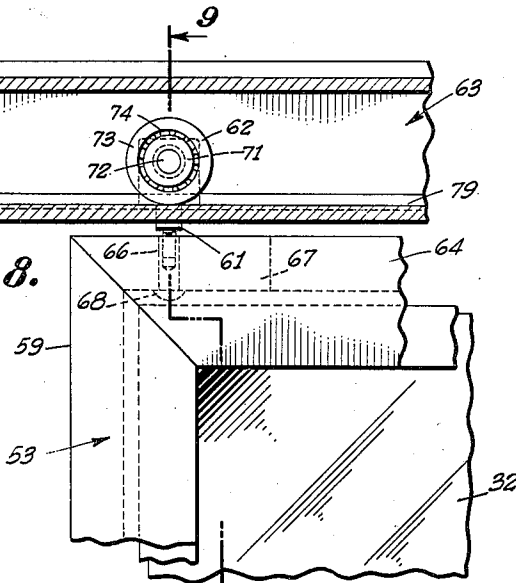


Fig. 9.

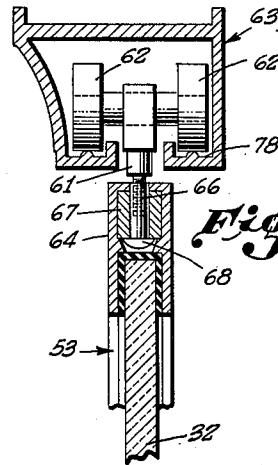


Fig. 10.

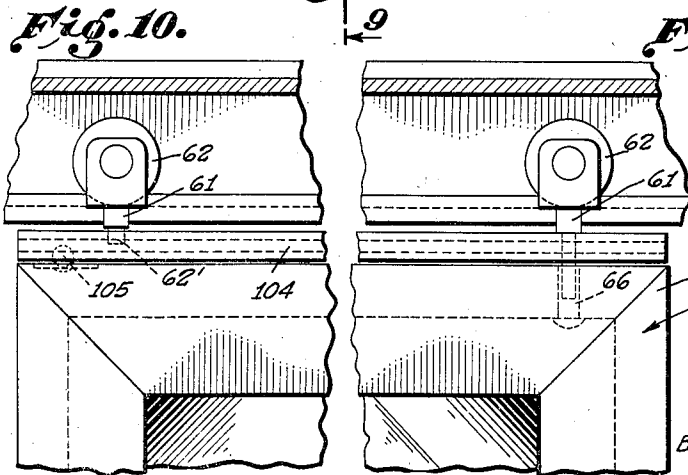
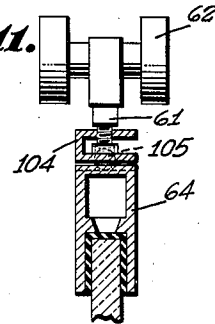


Fig. 11.



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2,331,822

FOLDING CLOSURE FOR RECESS TUB
SHOWER BATHEugene H. Zechiel, North Hollywood, and John
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Application December 6, 1938, Serial No. 244,270

2 Claims. (Cl. 160—206)

This invention relates to bathing apparatus and more particularly to a closure for a recess of the type within which a recess bath tub is frequently installed.

An object of the present invention is to provide a closure for a bath tub recess, as described, adapted to cooperate with the exposed edge of the recess tub to provide an adequate and altogether attractive door, capable of preventing splashing by a person either bathing within the tub or taking a shower by means of a shower-head installed above and adapted to direct its spray into the tub.

A more detailed object is to provide a closure for a recess tub of the general character indicated, adapted to be optionally extended into operative position above and cooperating with the exposed edge of the tub or folded back to withdrawn position at or adjacent one end of the tub, so as to permit easy access to and exit from the tub.

A further object is to provide means for adequately supporting the outer portion of the closure, i. e., that portion which is remote from the edge which is hinged to a wall of the recess, thereby preventing subjecting the door to wracking strains which otherwise probably would be so severe as to develop the liability of breaking the glass of which such doors usually are made. Our improved type of suspension facilitates opening and closing of the door by relieving the weight which otherwise would be imposed upon the hinge which connects the door to the side wall of the recess. It also protects the door from a large percentage of the probable causes of accidental breakage, by holding the door to a predetermined path of movement.

A still further object is to provide an improved recess tub door as described, which is of very simple and rugged, and, hence, durable construction, and yet which is capable of being embodied in any number of attractive designs, so as to harmonize with the other fixtures of the bathroom.

Yet another object of the present invention is to provide improved anti-splash means extending downward from the lower edge of the door to engage any suitable sill construction, such as the upper edge of the front of the tub, thereby effectually preventing splashing of water between the bottom of the door and the sill.

The invention possesses other objects and valuable features, some of which, with those enumerated, will be set forth in the following description of the preferred forms of our invention,

which are illustrated in the drawings accompanying and forming a portion of the specification. It is to be understood that we do not limit ourselves to the showing made by the said drawings and description, as we may adopt variations of the preferred forms within the scope of our invention, as set forth in the claims.

Referring to the drawings;

Figure 1 is a view in front elevation of a bath-tub recess of conventional design, having cooperatively associated therewith a folding closure incorporating the principles of the present invention.

Figure 2 is a horizontal sectional view taken upon the line 2—2 of Figure 1, with the direction of view as indicated. The door is shown partly open in dotted lines.

Figure 3 is an enlarged view in front elevation showing in detail the manner of suspending the outer portion of the folding closure. This figure may be considered a vertical sectional view taken upon the line 3—3 of Figure 2 with the direction of view as indicated. Portions of the figure are broken away to reduce its size.

Figure 4 is a transverse sectional detail view, the plane of section being indicated by line 4—4 of Figure 3.

Figure 5 is a detail view in horizontal section taken upon the line 5—5 of Figure 3 and showing the relative positions assumed by two adjacent panels when not quite closed and the anti-splash means associated therewith.

Figure 6 is a detail view in transverse vertical section taken through the lower portion of a shower door to show a modified form of anti-splash device.

Figure 7 is a view similar to Figure 2 showing a modified form of shower bath door incorporating the principles of the present invention.

Figure 8 is a view similar to Figure 3 showing the type of interconnection between the outermost panel of the door of Figure 7.

Figure 9 is a transverse vertical sectional view taken upon the line 9—9 of Figure 8.

Figure 10 is a view similar to Figure 8 showing the method of assembly in incorporating the roller supports of Figure 9 with a shower bath closure of the type illustrated in Figures 1 and 2.

Figure 11 is a view in side elevation of the roller support of Figures 9 and 10.

Referring first to the modification illustrated upon Figures 1 to 4 inclusive, we have shown our improved closure, indicated in its entirety at 6, as being cooperatively associated with a bathtub 7 of the type commonly known in the trade as a

recess tub for the reason that it is intended for installation within a recess 8 in a wall 9, with the result that the tub does not project out into the room. Hence, the recess 8 is enclosed on 3 sides by a backwall 9' and two opposed endwalls 11 and 12. Obviously if the recess 8 is at one corner of the room, however, one of the endwalls would be merely a continuation of one of the walls of the room.

It is customary to line all or a portion of the interior of a tub recess with tile or otherwise to make the surfaces waterproof as well as the front wall or apron 13 which extends downwards from the exposed edge 14 of the front of the tub 7. It is this front wall or apron 13, whether it be tiled or an integral portion of the tub 7, that presents the sill construction with which the folding closure 6 cooperates to present an efficiently operating closure for the recess 8 to prevent splashing under the folding closure 6. A shower head 17 frequently is installed in such a tub recess in such a manner that it may be used by a person standing or seated in the tub 7 to provide a shower bath, and such use of a tub recess would cause a relatively large amount of splashing beyond the confines of the recess 8, were some means not provided for its prevention.

The closure 6 comprises a plurality of vertical panels, the closure 6 here illustrated employing three such panels indicated at 21, 22, and 23, respectively. Each two adjacent panels are hinged together at their proximal vertical edges; that is to say, the panels 21 and 22 are hinged together, and the panels 22 and 23 also are hinged to each other. Similarly the panel 21, which preferably is the panel distal from the shower head 17 and the handles (not shown) whereby the flow of water to the tub 6 is controlled, is hinged to the associated end wall 12 of the recess 8 in such position that when extended the panels are disposed above and are substantially parallel to the front and exposed edge 14 of the tub 7. The hinge 26 supports the innermost panel 21 upon the end wall 12, and is so arranged that it permits this panel 21 to swing inwards toward the end wall 12. The hinge 27 interconnecting the panels 21 and 22 permits the panel 22 to fold back close to that face of the panel 21 which faces the tub when the panel 21 is folded back against the end wall 12. The hinge 28, interconnecting the intermediate panel 22 and the outermost panel 23, is so arranged that the panel 23 remains in its original plane, i. e., parallel to the front edge 14 of the tub, while the panels 21 and 22 swing to their collapsed or folded position as described.

The customary construction employed in shower bath and similar doors embodies a frame of metal and a large panel of glass. Whereas any suitable type of construction may be employed for the panels 21, 22, and 23, we prefer that they be constructed in accordance with conventional practice; at least so far as their material is concerned, that is, each panel is preferably formed of a metal frame 31 retaining a panel 32 of glass, either clear, frosted, or ornamented, as may suit the requirements of any individual case.

Such being the case, the panels 21, 22, and 23 are relatively heavy; hence, we have found it desirable to provide means, in addition to the hinge 26, for supporting the weight of the outermost panel 23, and preferably a portion of the weight of the intermediate panel 22. For this purpose, we provide a track 36 disposed above the front

edge 14 of the tub at such height that the panels 21, 22, and 23 can be moved therebelow and preferably interconnecting the two end walls 11 and 12 of the recess 8. The type of track illustrated upon Figures 3 and 4, is of tubular form, and accommodates therein the rollers 37, whereby the outermost panel 23 is adjustably supported upon the track 36; hence, the rollers 37 are concealed from view. This is an important feature in connection with a shower bath door, inasmuch as the attractive appearance of the finished article is as important in determining its sale value as its mechanical perfection. Furthermore, disposing the supporting rollers inside a tubular track affords the householder especial convenience because of the fact that towels and the like thrown over the rail 36 will not interfere with facile operation of the rollers. In accordance with this plan, one wall, preferably the bottom wall 38 of the tubular track 36, has a slot 39 extending longitudinally thereof to accommodate brackets 41, rigid with the panel 23 and extending upwards from the upper edge thereof to the interior of the tubular track 36. It is upon these brackets 41 that the rollers 37 are journaled; the parts being so proportioned and arranged that the rollers engage the interior face of the bottom wall 38, thus enabling them to support the weight of the outer panel 23 and preferably a portion of the weight of the next adjacent panel, regardless of whether the entire closure be extended into operative position or folded back into withdrawn position.

When there are more than two panels in the door or closure 6, we prefer that the outermost panel 23 remain parallel to the front edge of the tub; hence, in this type of construction a plurality of rollers 37 and brackets 41 may be employed preferably one adjacent each vertical edge of the panel 23, or if desired a single bracket 41 may be employed corresponding in width to the panel 23 and having rollers 37 mounted thereon adjacent each edge of the bracket. One advantage inherent in a support of this type is that, since the outer panel is supported by a pair of rollers disposed in spaced relation along the supporting track, the outer panel 23 not only is supported and guided by the track, but it also is restrained against rotary movement in its own plane. That is to say, the edge of the outer panel 23 to which the intermediate panel 22 is hinged is prevented from swinging downwards, as it might otherwise have the tendency to do, since at least a portion of the weight of the intermediate panel is imposed thereupon. This relieves the load which otherwise would have to be born by the hinge 26, and therefore is an aid in avoiding the wracking stresses which would jeopardise the glass carried by all of the panels.

A convenient method of providing a bracket, or brackets 41 as the case might be, is to form it integrally with the channel 42 forming the upper member of the frame of the panel 23. In other words, the bracket 41 may be merely a vertical flange extending upwards from the channel 42 through the slot 39.

In some types of installation, two panels may be sufficient. Figures 7, 8, and 9 illustrate a slightly modified construction incorporating this principle. Here the closure 51 comprises an inner panel 52 and an outer panel 53 hingedly joined together as at 54, and the panel 52 being hinged to the proximal end wall 56 of the tub recess 57. The panels 52 and 53 are withdrawn to folding position by movement of the hinge 54

in an arc about the axis of the hinge 58 which connects the panel 52 to the end wall 56, until the panel 52 lies closely adjacent and substantially parallel to the end wall 56. The outer panel 53 folds upon the inner panel 52 until it, too, lies parallel to the end wall 56 and closely adjacent and parallel to the inner panel 52. This described folded position of the two panels 52 and 53 is indicated in broken lines in Figure 7. When the shield moves to its open, i. e., folded, position, the outer edge 59 of the outer panel moves in a straight line from its extended position to a position closely adjacent to hinge 58, therefore, the panel 53 carries but a single bracket 61, carrying one or more rollers 62 inside the tubular track 63. Inasmuch as the panel 53 must turn with respect to the plane of the track 63, a swivel connection is provided between the brackets 61 and the upper frame member 64 of the panel 53. For this purpose, the lower end of the bracket 61 carries a pin 65 extending through the upper web of the frame member 64 and through a bushing 67 disposed inside this frame member 64, a head 68 on the lower end of the pin 65 engaging the lower end of the bushing 67 to impose the weight of the panel 53 upon the bracket 61. Inasmuch as the pin 65 is free to rotate inside the bushing 67 and, for that matter the bushing itself is also free to rotate with respect to the frame member, the desired swivel interconnection is provided. It will be observed that a single roller 37 is used in connection with the bracket 41, whereas a pair of opposed rollers 62, are employed in connection with the bracket 61. It should be understood that either type of roller construction can be employed with either type of bracket, i. e., it has been found satisfactory to employ the double roller construction in connection with the three panel door, wherein the outermost panel 23 moves in translatable motion remaining parallel to the front face of the tub. Similarly, a single roller construction illustrated in Figures 3 and 4, can be used with equal advantage on a swivel bracket, adapting it for use in conjunction with a two panel door wherein the panel supported by the rollers must swing out of the plane of the front face of the tub.

Attention also is invited to the fact that the rollers 37 and 62 are of the ball bearing type, in fact we have found it most expedient to employ standard roller bearings for this purpose. Each roller 37 or 62, as the case might be, comprises an inner race 71 affixed to the horizontal shaft 72, which is rigid with the bracket 41 or 61, as the case might be, and an outer race 73 which is disposed in rolling contact with the inner face of the bottom side of the tubular rail 36 or 63, as the case might be. The balls 74 of the bearing, are disposed between the two races 71 and 73, so that the outer race can rotate with a minimum of friction.

Another detail which is of importance is illustrated in Figures 3 and 4. The roller 37 is only slightly less in diameter than the distance between the inner face of the underside of the track 36 and the inner face of the upperside 76 of the track, hence, any upward motion of the roller 37 is definitely limited, preferably, the clearance between the roller 37 and the upper side of the track is less than $\frac{1}{2}$ inch. This type of construction has been found advantageous in guiding the door in its opening and closing movements, in effectually preventing any chattering which might otherwise develop were the roller or rollers permitted to

jump upwards off the surface upon which they normally bear.

It will also be observed that that portion of the under surface 38 of the track upon which the roller 37 bears, is grooved as at 77, and that the roller 37 engages the track 36 within that groove. This construction aids in guiding the movement of the associated portions of the door in a straight line. Similar groove 78 (Figure 9) is provided for each of the rollers 62 where the double roller type of support is employed.

Whereas Figure 8 illustrates the manner of mounting a single swivelled bracket upon the type of closure employing but two panels, thus necessitating that the panel to which the roller is secured swings out of the plane of the front of the tub, Figure 10 illustrates the application of the rollers 62 to a three panel door wherein the outermost panel 23' is required to move in translatable movement.

Whether a door of two or more panels be employed, it is usually desirable to provide an anti-splash device secured to the lower edge of each panel and adapted to make contact with a suitable sill construction such as the upper side of the front of the tub. Figures 4 and 5 illustrate one embodiment of such an anti-splash device indicated in its entirety at 81. This takes the form of a strip of flexible and preferably waterproof material, such as rubber, secured along its longitudinal center line along the under edge 82 of each panel; preferably, the means of attachment comprises an inverted channel 83 rigid with the lower edge of the panel, and a flat strip 84 slightly narrower than the interior of the channel 83 so that when the screws 85, whereby the strip 84 is removably secured, are tightened, the strip 84 is drawn into the concave portion of the channel drawing with it a width of the flexible strip 87, substantially corresponding in width to the channel. This will result in causing two opposed parallel flaps 88 and 89 to extend from the lower edge of the panel and spaced apart a distance substantially corresponding to the width of the strip 84. Accordingly, when the panel moves to closed position, the lower edges of both flaps 88 and 89 will wipe over the upper surface of the sill construction, bending the flap to the configuration illustrated in Figure 4, inasmuch as the flaps are materially longer than the width of the space intervening between the panels and the sill. Preferably the flaps are so long that when they are deflected, as described, the flap that leads during this closing movement of this panel, is bent back far enough to make actual contact with the other flap, with the result that not only is a double line of contact between the anti-splash device and the sill established, but also the trailing flap 89 adds its weight and resilient pressure to the leading flap 88 to enhance the security of the engagement between the leading flap and the sill.

Means are also provided for establishing a fluid-tight seal between the anti-splash device on each two adjacent panels. Figure 6 illustrates that each anti-splash device 81 is slightly longer than the width of the associated panel, thus leaving a slight projection 91 on the end of each anti-splash device 81, which extends beyond the proximal vertical edge of the associated panel far enough to move into abutting engagement with the correspondingly projecting portion 92 of the opposed anti-splash device 81 of the next adjacent panel, such engagement initially taking

place just prior to completion of the swinging movement which brings the two panels into alignment. Accordingly, continuation of such swinging movement to its completion will cause these two projecting portions 91 and 92 to be pressed against each other so firmly that they will be deformed slightly, establishing an efficient fluid-tight seal which reaches all the way down to the upper surface of the sill.

Another form of anti-splash device and preferred means for securing it, are illustrated in Figure 6. This anti-splash device 96 comprises a flexible strip 97 of rubber or similar material provided along its upper edge with an enlarged, continuous head or beading 98. This beading is preferably triangular in cross section, having its base disposed uppermost, and its apex at its line of juncture of the head 98, with the remainder of the strip 97. A groove 99 of complimentary cross sectional configuration is provided in the under surface of the bottom of each panel to receive the type of anti-splash strip described. This permits the strip 96 to be attached to the panel by slipping the head 98 endwise into the groove 99. The strip is then securely and permanently fastened in place by bending the extreme ends of the groove upwards, embedding them within the material of which the strip is formed. This can most easily be accomplished by placing a center punch or similar tool against the under surface of the frame member 101 within which the groove 99 is formed, and at each extreme corner defining the ends of the groove, and then striking the tool with a hammer hard

enough to bend the metal upwards to embed the corners within the head 98 of the strip 97 at each of these corners as indicated at 102.

We claim:

- 5 1. A folding door construction comprising an inner door section hinged along its inner vertical edge to a stationary support, an intermediate door section hinged along its inner edge to the outer edge of said inner door section, and an outer door section hinged along its inner edge to the outer edge of said intermediate section, a track extending across the door opening, and means supporting said outer panel on said track to guide said outer panel in movement across said opening and to support said outermost panel against rotary movement whereby not only the weight of said outermost panel but at least a portion of the weight of said intermediate panel is supported by said track.
- 10 2. A folding door construction comprising an inner door section hinged along its inner edge to a stationary support, an intermediate door section hinged along its inner edge to the outer edge of said inner door section, and an outer door section hinged along its inner edge to the outer edge of said intermediate section, a track extending across the door opening, and means supporting said outer section on said track, said supporting means comprising a plurality of rollers engaging said track in spaced relation therealong, and means connected to said outer panel on which said rollers are journaled.

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