June 15, 1965 H. J. WALTERS 3,188,699

PIVOTING BATHTUB ENCLOSURE

Filed May 13, 1963 3 Sheets-Sheet 1

Fig. 1

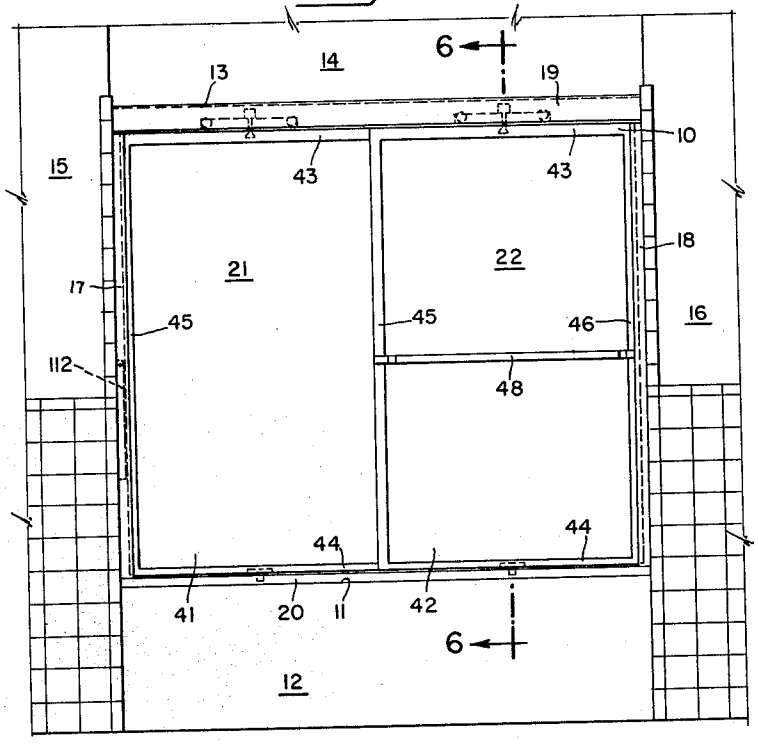


Fig. 2

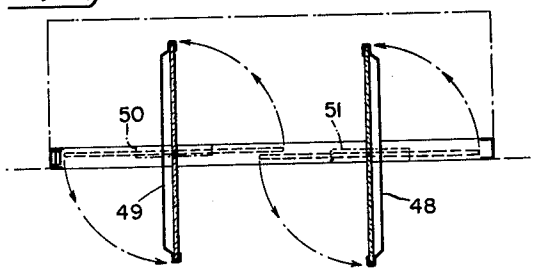
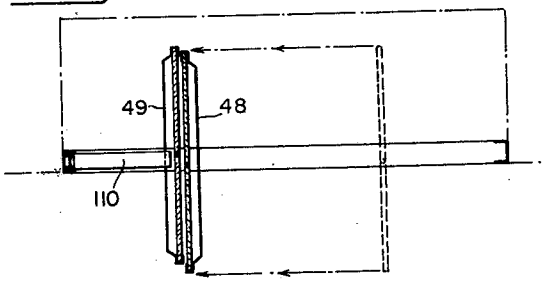


Fig. 3



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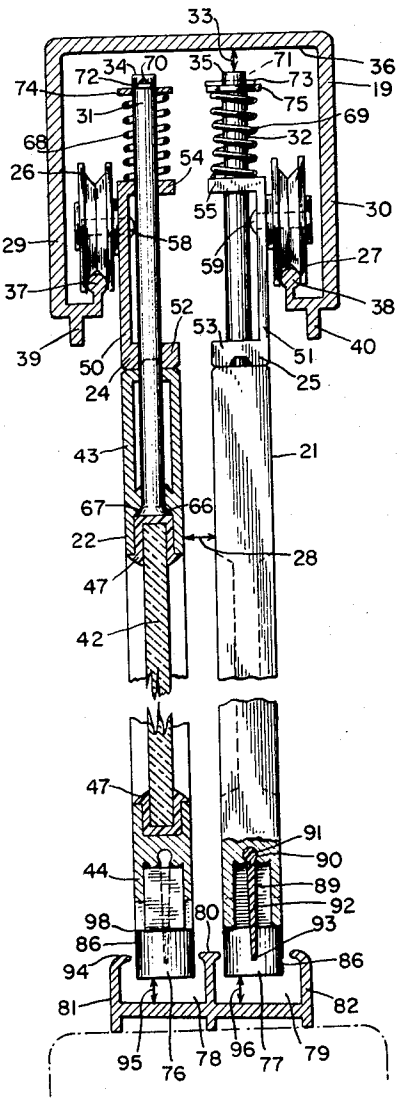


Fig. 4

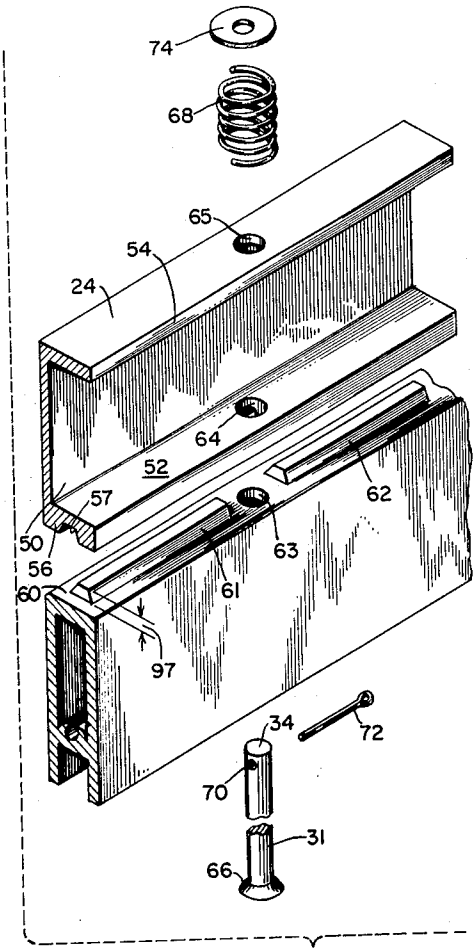


Fig. 5

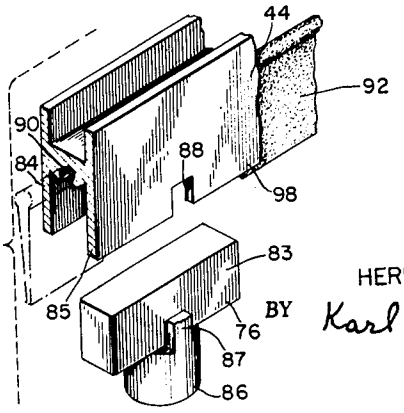


Fig. 6

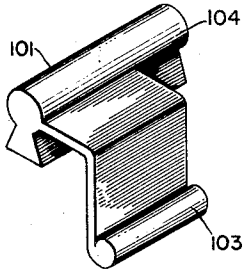
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PIVOTING BATHTUB ENCLOSURE

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Fig. 7



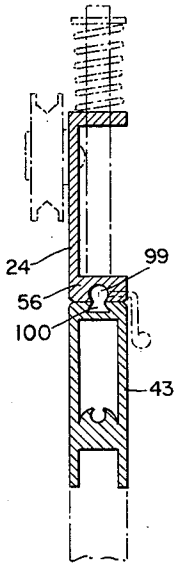


Fig. 8

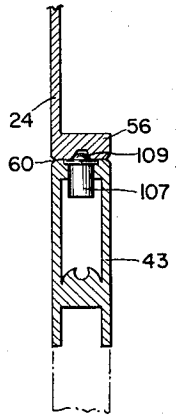


Fig. 11

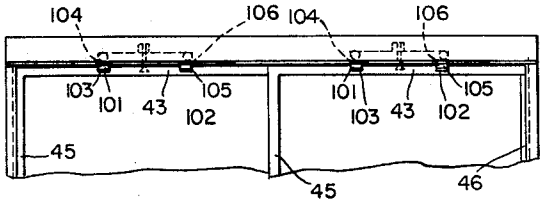


Fig. 9

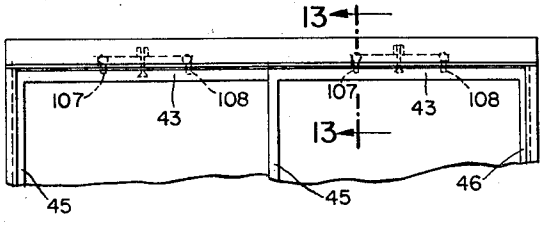


Fig. 10

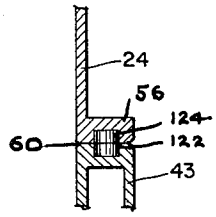


Fig. 12

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3,188,699

PIVOTING BATHTUB ENCLOSURE

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1 Claim. (Cl. 20—19)

This invention relates in general to bathtub enclosures and more particularly to the type of enclosure incorporating top and bottom tracks whereby a plurality of doors may be hung in horizontal, sliding arrangement.

It is usual practice to enclose the open space above bathtubs when showers are installed in connection therewith to prevent water from shower head from splashing onto the floor so that orderliness may be maintained. It is further important to confine the shower spray in order to prevent possible structural damage to the building from the dampness and to reduce the possibility of insect infestation.

In order to adequately restrain the particles of water sprayed from the shower head, it has long been the usual practice to utilize shower curtains suspended from tub encircling curtain rods using large, sliding curtain hooks. More recent improvements have included glass tub enclosures usually designed with a pair of horizontal, sliding doors. Under usual conditions, top and bottom tracks are provided at the open space above the tub and the doors are movably hung from the top track and guided in the bottom track in such a manner that the doors may be readily moved horizontally to permit entrance to the tub.

While glass enclosures having sliding doors may be suitably sealed to prevent escape of water and generally have proven quite popular due to their ability to enhance the appearance of a bathroom, all devices presently known and in use suffer from the same common deficiency. Namely, the doors slide one upon the other in separate tracks, and when in the open position, one door is stopped immediately behind the other. Such an arrangement is generaly satisfactory inasmuch as easy entrance to the tub is provided by the open door. However, such an arrangement is not satisfactory when the bathtub is to be used by children or by an invalid when supervision and help from persons outside of the tub will be required. Under such circumstances, it is apparent that the sliding doors will seriously reduce the opening to the tub and thus interfere with easy access to the children or invalid using the facility. The instant invention seeks to overcome this shortcoming by retaining all of the advantages of the glass shower enclosure and at the same time permitting full access to the bathtub interior.

It is therefore an object of this invention to provide a bathtub enclosure incorporating novel door hanging means.

It is another object of this invention to provide a bathtub enclosure wherein doors have usual horizontal freedom and limited vertical movement.

It is another object of this invention to provide a novel bathtub enclosure wherein door hanging means including springs are utilized.

It is another object of my invention to provide a novel bathtub enclosure wherein door frame members may be pivoted in relation to line of track.

It is another object of my invention to provide a novel bathtub enclosure wherein doors may have both sliding motion and pivoting action.

It is another object of my invention to provide a novel bathtub enclosure wherein simultaneous horizontal motion and rotating motion may be imparted to doors.

It is another object of my invention to provide a novel bathtub enclosure wherein bottom of doors may be provided with elongated, flexible sealing means.

It is another object of my invention to provide a novel bathtub enclosure wherein a door locking device may be incorporated.

It is another object of my invention to provide a novel bathtub enclosure of the pivoting door type wherein doors may be secured in at least three different positions.

It is another object of my invention to provide a bathtub enclosure featuring sliding doors pivotally secured by a novel bottom guide member.

It is another object of my invention to provide a novel bathtub enclosure that is simple in operation, inexpensive in manufacture and trouble-free upon installation.

Other objects and a fuller understanding of the invention will be had by referring to the following description and claims of a preferred embodiment thereof, taken in conjunction with the accompanying drawing wherein like reference characters refer to similar parts throughout the several views and in which:

FIG. 1 is a front elevation view showing general arrangement of shower doors and certain novel features in phantom lines.

FIG. 2 is a top plan view showing pivoting movement of shower doors.

FIG. 3 is a top plan view showing sliding movement of doors while in pivoted position.

FIG. 4 is a cross section taken along line 6—6 of FIG. 1.

FIG. 5 is a partial perspective exploded detail of top door hanger central portion.

FIG. 6 is a partial perspective exploded detail of bottom door guide.

FIG. 7 is a detail of door locking modification.

FIG. 8 is a cross section of top door hanger showing modified construction using key of FIG. 7.

FIG. 9 is a front elevation view showing arrangement of modified lock using key of FIG. 7.

FIG. 10 is a front elevation view showing arrangement of modified lock using bullet catches.

FIG. 11 is a cross section taken along line 13—13 of FIG. 10.

FIG. 12 is a cross section of top door hanger showing modified construction.

Although specific terms are used in the following description for the sake of clarity, these terms are intended to refer only to the particular structure of my invention selected for illustration in the drawings and are not intended to define or limit the scope of the invention.

As shown in FIG. 1 a shower enclosure **10** in accordance with this invention is provided between top **11** of the room side of a conventional bathtub **12** and the bottom **13** of ceiling construction **14** immediately over said side and extends completely between end enclosing constructions **15, 16.** The usual door enclosing side masters **17, 18,** top master **19** and bottom master **20** frame opening above tube and are conventionally secured to hang and guide doors **21, 22** similar to presently known devices.

Referring now to FIG. 4, I show top master **19** constructed of extruded aluminum of cross section generally similar to a channel section but modified as required for the intended service. Web **23** is of width necessary to contain door hangers **24, 25** and rollers **26, 27** in side by side relation without binding to permit horizontal sliding movement of doors **21, 22** leaving clearance space **28** therebetween. Flanges **29, 30** depend from web **23** a distance sufficient to house rollers **26, 27,** door hangers **24, 25** and top pivot pins **31, 32** leaving clearance space **33** between tops **34, 35** of pins **31, 32** and underside **36** of web **23** and terminate inwardly in upturned rounded tracks **37, 38** to receive rollers **26, 27** in rolling contact. Continuous stiffeners **39, 40** extend throughout entire length of top master **19** to provide additional strength and to pre-

vent bending of tracks 37, 38 upon operation of doors 21, 22.

As shown in FIGS. 1 and 4, each door 21, 22 is similarly constructed with large panel sections 41, 42 of glass or plastic material tightly held in peripheral binding aluminum frame members. Said frame members include top glass frame 43, bottom glass frame 44, and enclosing side glass frame members 45, 46 and a continuous, resilient waterproof, binding strip 47 seals entire joint between frame and glass. Towel bars 48, 49 connect to side glass frames 45, 46 horizontally respectively inside and outside to permit the sliding doors 21, 22 to pass each other in operation.

Door hangers 24, 25 are constructed of extruded aluminum channel sections and are installed with webs 50, 51 vertical. Bottom flanges 52, 53, of heavier cross section than top flanges 54, 55, are provided with a lengthwise, trapezoidal slot 57, centrally positioned and indented upwardly from the bottom 56 with the base of trapezoid lying in same horizontal plane as bottom of flange 56. A sufficient number of rollers 26, 27 rotatably secured to webs 50, 51 by pins 58, 59 extend between webs 50, 51 of door hangers 24, 25 and flanges 29, 30 of top master 19 to adequately support the weight of doors 21, 22 in rolling contact with tracks 37, 38.

I have found it desirable to provide top hangers 24, 25 fourteen inches in length extending laterally seven inches on either side of centrally positioned pivot pins 31, 32 in order to assure the greatest pivoted opening consistent with sturdy construction. If desired, lock bar 110 may have also an effective length of seven inches in order to firmly support door in pivoted position. It may be readily seen that when door 21 is pivoted about pin 31 and guide 76 to the position indicated in FIG. 3, the end of top hanger 24 will slide along track 37 and contact the side master 17. Lock bar 110 having the same effective length as one-half top hanger 24 when locked upon towel bar 49 will complete a firm, two position, door stop.

Top glass frame 43 is constructed the same for each door 21, 22 and is provided with top surface 60 in separable engagement with bottom 56 of door hangers 24, 25. Longitudinal keys 61, 62 of trapezoidal cross section corresponding to slot 57 project above surface 60 for separable engagement in slot 57. Vertical hole 63 is drilled through top glass frame along a central, longitudinal axis bisecting doors 21, 22 into equal, pivoting halfs. Corresponding holes 64, 65 are drilled through flanges 52, 54 and 53, 55 in vertical alignment with hole 63 to receive top pivot pins 31, 32 allowing relative, vertical motion between pins 31, 32 and door hangers 24, 25.

Pivot pins 31, 32 may be of aluminum or brass with flared head 66 seating in the recess 67 of the top glass frame 43 in stationary engagement. Pins 31, 32 project upwardly through holes 63 in top glass frames and holes 64, 65 in door hangers a distance above top flanges 54, 55 sufficient to receive compression springs 68, 69 leaving clearance space 33. Horizontal holes 70, 71 near ends 34, 35 are provided to receive cotter pins 72, 73 which retain brass or aluminum washers 74, 75 above springs 68, 69. Springs 68, 69 are installed about pins 31, 32 under compression to pull mating surfaces 56, 60 and slot and keys 57, 61, 62 into engagement. I have found a spring force of approximately fifteen pounds suitable for this purpose and for operation of pivoting doors as hereinafter described.

Bottom pivot guides 76, 77 are a press fit in the bottom glass frames 44 and ride in horizontally juxtaposed tracks 78, 79 in the bottom master 20 separated by divider 80 and contained by end strips 81, 82. Guides may be constructed of plastic and are provided with a generally rectangular insertion portion 83 that may be urged between depending arms 84, 85 of bottom glass frame 44. Cylindrical guide portions 86 may be molded integrally with insertion portion 83, ride within tracks 78, 79 and are of such size as to permit sliding clearance between divider 80 and respective end strips 81, 82. Projecting lugs 87 (opposite lug not shown) lock into recesses 88 (opposite recess not shown) in arms 84, 85 of the bottom glass frame 44 to prevent relative motion between guides 86 and the bottom glass frame 44 upon operation of doors 21, 22 along a central, longitudinal axis bisecting doors into equal, pivoting halfs exactly in line with plane defined by the vertical projection of pivot pins 31, 32.

Bottom door sweep 89 fabricated of flexible plastic engages a continuous circular recess 90 extruded in lower surface of bottom glass frame 44. Head bead 91 may be urged laterally into recess 90 from each side of respective door 21, 22 until the door sweep 89 abuts the centrally positioned bottom guides 86 on each side of rectangular portion 83 forming a substantially water-tight sheet across bottom of each door. Flexible skirt portion 92 of door sweep 89 hangs vertically from head bead 91 and is of sufficient height to permit the lower edge 93 to extend below top 94 of end strips 81, 82. Overall height of guides 76, 77 when installed with doors 21, 22 must be so limited as to provide a bottom clearance 95, 96 somewhat greater than the height 97 of keys 61, 62 but less than the distance between bottom 98 of the glass frame 44 and top 94 of end strips 81, 82.

It is thus seen that I have provided a construction enabling doors 21, 22 to be pivoted respectively about pivot pins 31, 32 and bottom guides 76, 77 without interfering with the usual sliding door operation utilizing rollers 26, 27 rotating upon tracks 37, 38. In order to pivot door 21, it is simply required to grasp the side glass frames 45, 46 simultaneously and exert a downward force in excess of fifteen pounds in order to overcome action of spring 68. Pivot guide 76 will bottom against the bottom master 20 permitting key 61 to clear slot 57 and terminate the motion of bottom glass frame 44 above the top surface 94 thereby insuring rotation of the door about pin 31 and pivot guide 76.

As an alternate method of construction, I have shown in FIGS. 7, 8 and 9 a door pivoting mechanism similar to that hereinabove described except that the upper keyway 99 has been extruded in bottom flange 56 of door hangers 24, 25 in lieu of a slot 57 and the lower keyway 100 has been extruded in the top glass frame 43 in lieu of keys 61, 62. Right and left plastic locks 101, 102 comprising respectively a handle 103, 105 and an integral key 104, 106 shaped to conform to the configuration of upper and lower keyways 99, 100 are urged laterally into keyways from beyond the side glass frames 45, 46 toward pivot pins 31, 32 to secure upper glass frame 43 to respective door hangers 24, 25. In order to pivot doors, right and left handle 105, 103 may be urged outwardly in upper keyway 99 beyond side glass frames 45, 46 until the locks 101, 102 ride clear of lower keyway 100 thus freeing doors 31, 32 for pivoting motion.

As a second alternate method of construction, I have shown in FIGS. 10, 11 a door pivoting mechanism similar to that hereinabove described except that right and left bullet catches 107, 108 of any well known design have been imbedded in the top glass frame approximately six and one-half inches laterally spaced from the central, longitudinal axis of door, with a spring loaded ball 109 projecting above top surface 60. Slot 57 receives and retains ball 109 thereby locking doors 31, 32 in horizontal sliding position. In order to pivot the door, right and left side glass frames 45, 46 should be grasped and a horizontal force couple applied of magnitude sufficient to overcome the restraining force of bullet catch springs (not shown).

As a third alternate method of construction, I have shown in FIG. 12 a door pivoting mechanism similar to that hereinabove described except that right and left door magnets 122, 123 (not shown) of any well known design have been imbedded in the top glass frame approximately six and one-half inches on either side of the longitudinal, central axis with the magnet top flush with the top sur-

face **60**. Cooperating, opposed hanger magnets **124**, **125** (not shown) are imbedded in the bottom flange **56** with the magnet bottom flush with the flange bottom. Magnets should be of sufficient strength to hold doors in sliding position and should be installed with respective North and South poles attracting in the usual manner. In order to pivot the door, right and left side glass frames **45**, **46** should be grasped and a horizontal force couple applied of magnitude sufficient to overcome the restraining force of magnetic attraction between the pairs of opposed magnets, **122**, **124** and **123**, **125**.

Referring now to FIGS. 1 to 3, the lock bar **110** is hinged to side master **17** and may be of any desired length to retain door **21** in pivoted position and spaced from side master **17**. The lock bar may be conveniently formed from extruded aluminum channel section of width to fit entirely within the flanges of side master **17** and is pinned or otherwise hinged thereto. When in operating position, lock bar **110** rests horizontally at an angle of ninety degrees from the vertically upright side master **17**.

As best seen in FIGS. 2 and 3, the doors **31**, **32** may be pivoted and horizontally moved and may be locked away from side master **17**. Of course, as is readily apparent, doors **31**, **32** may be pivoted and both moved horizontally to close proximity to the side master leaving lock bar **110** in closed position **112**.

If desired, a second lock bar **110** may similarly be hingedly connected to the opposite side master **18** to retain the door **22** in pivoted position spaced from the side master **18**. In such a manner, each door may be respectively locked to a side master and be widely spaced from each other.

Although I have described my invention with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

In a bathtub enclosure of the horizontal sliding door type,

a master frame secured to the periphery of the opening to be enclosed,

the said frame including a pair of horizontally juxtaposed ceiling tracks and a pair of horizontally juxtaposed floor tracks,

the floor tracks being immediately below and in the same vertical plane as the ceiling tracks;

a pair of doors respectively sliding horizontally within said ceiling and floor tracks,

each door having a central, longitudinal axis;

pivoting means secured to each door whereby each door may be pivoted about the said axis,

said pivoting means including a horizontally disposed door hanger,

said door hanger being of substantially channel cross section and hung with the web of said channel vertical,

said door hanger rotatively carrying a plurality of rollers contacting said ceiling tracks,

said door hanger provided with vertical holes drilled through the flanges of said channel along said central, longitudinal axis, and the bottom of said hanger being milled to provide a horizontal, vertically indented groove;

having means supporting the said door from said door hanger,

said hanging means including a vertical pivot pin having its head pivotally secured to the door with the shank thereof vertically extending through said holes and spring means securing said pivot pin to said door hanger;

and a horizontal ridge rising above the top of said door,

said ridge being sized to fit within said indented groove at the bottom of said door hanger,

said ridge being biased within said groove by said spring means whereby said door is separably aligned with said door hanger.

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