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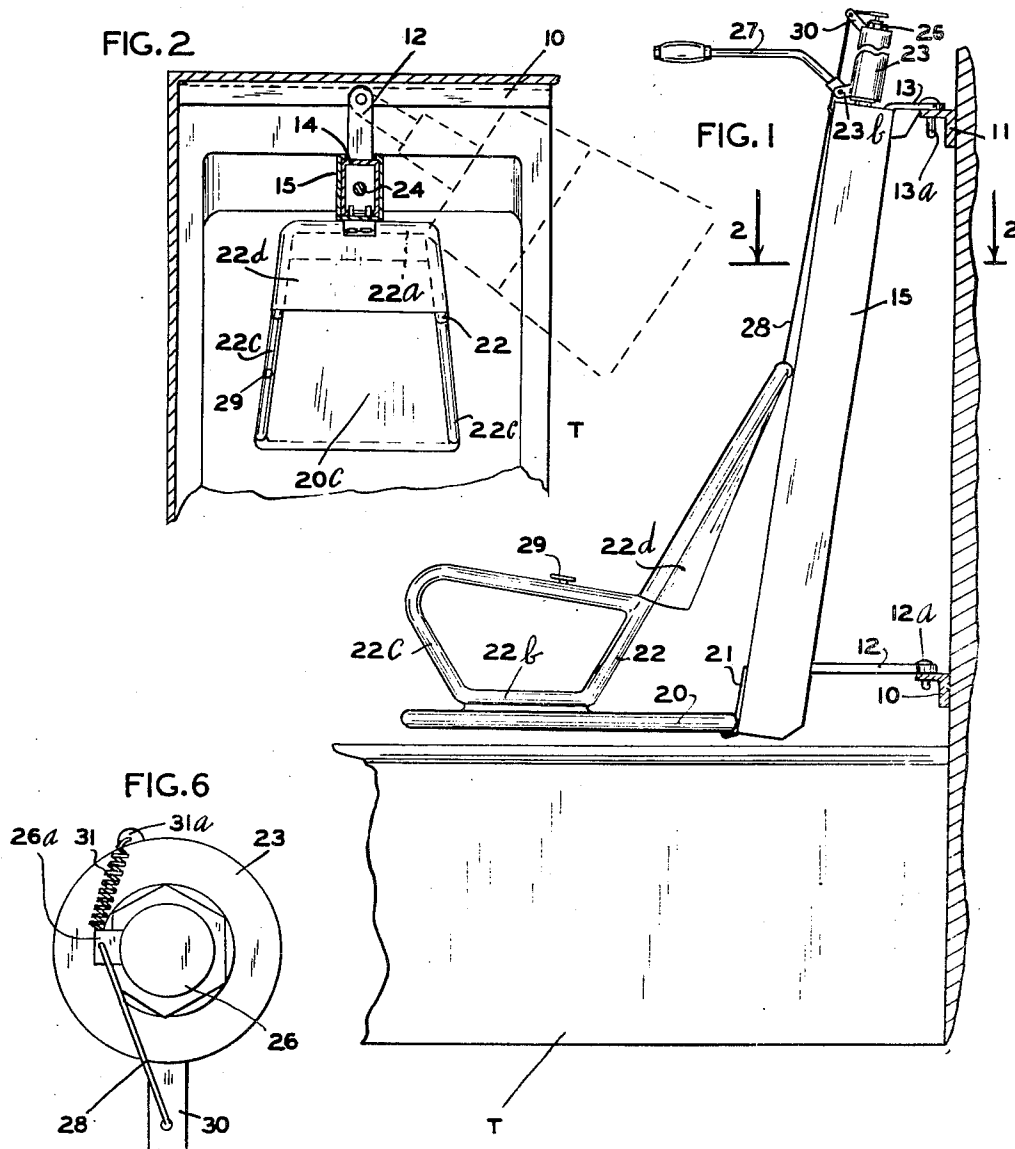
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INVALID SUPPORTING AND HANDLING APPARATUS FOR BATHTUBS

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2 SHEETS--SHEET 1



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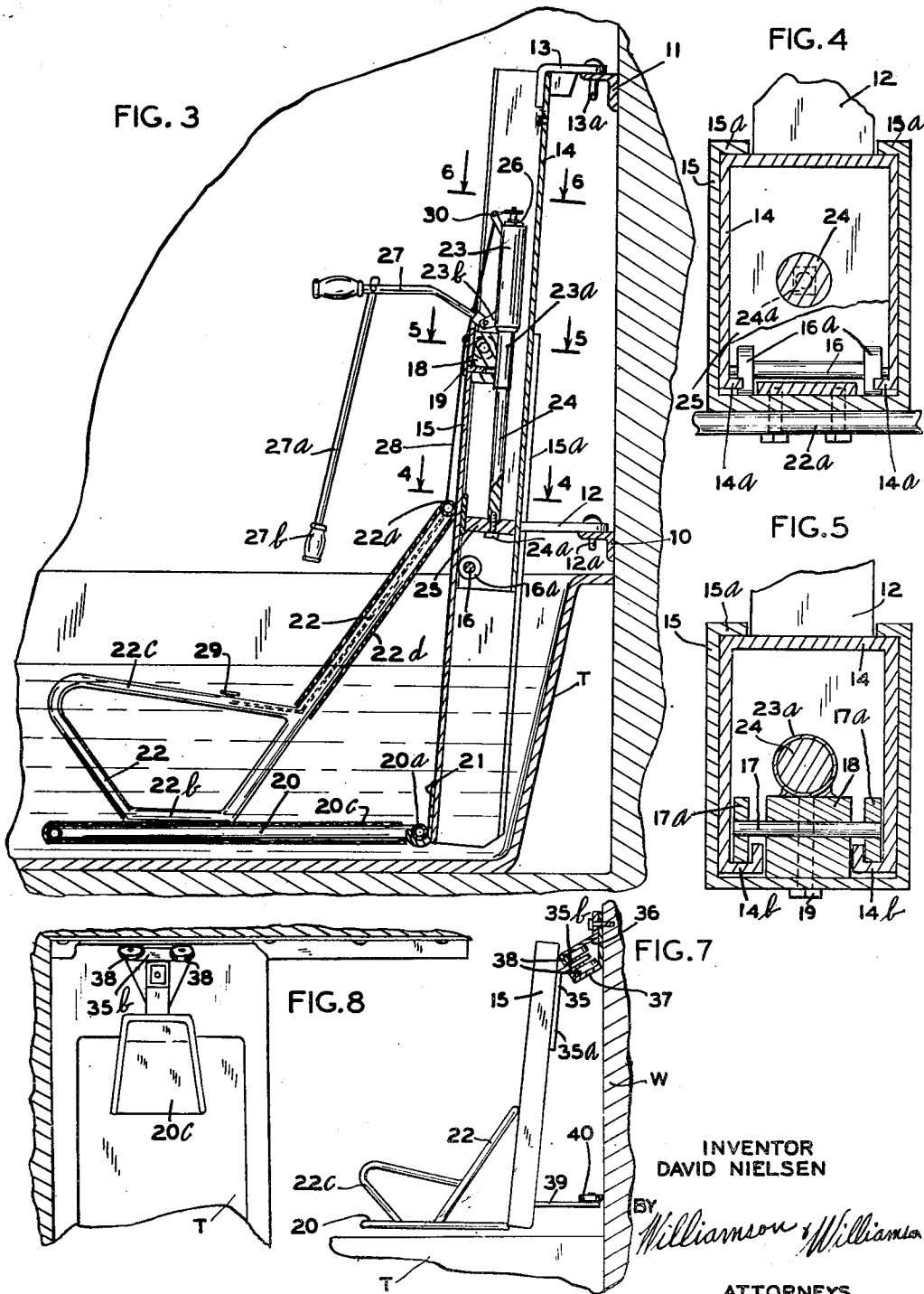
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2 SHEETS—SHEET 2



UNITED STATES PATENT OFFICE

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INVALID SUPPORTING AND HANDLING
APPARATUS FOR BATHTUBSDavid Nielsen, St. Paul, Minn., assignor of one-
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8 Claims. (Cl. 4—185)

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This invention relates to bath apparatus to enable invalids, handicapped or aged persons to bathe in a conventional tub and to readily position and lower themselves into the tub and to mechanically lift and remove the person therefrom, after bathing.

It is an object of my invention to provide a simple, rugged and easily operable invalid supporting and handling apparatus for bath tubs to enable a feeble or handicapped person, from a position outside of the tub, to be supported and shifted into a position over the tub and thereafter, lowered and at least partially immersed in the bathing water, all subject to control and operation by the user.

A further object is the provision of a device or apparatus of the class described wherein a body support or seat is readily shiftable from a receiving position outside of and above the tub to a position over the tub and thereafter, may be lowered by the user to submerge at least a portion of the body into the water of the tub and which thereafter may easily be elevated and shifted to a position outside of the tub for delivery.

More specifically, it is an object to provide bath apparatus for supporting and handling incapacitated persons, which is adapted to be readily and compactly installed in conventional bath rooms, preferably adjacent one end of the tub and which utilizes an upstanding support mounted for shifting movement generally in a line of travel traversing the bath tub and wherein said support comprises a pair of relatively longitudinally adjustable sections, one being mounted on the other for vertical adjustment and carrying a laterally extending support or seat upon which the body of a feeble person may rest.

A still further object is the provision of apparatus of the class described wherein efficient hydraulic mechanism for elevating and lowering the invalid support is supplied and mounted within the confines of the two sections of the supporting post or structure and is readily controllable by the user from a position conveniently accessible to the support or seat.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to similar parts throughout the several views and in which:

Fig. 1 is a side elevation of an embodiment of my invention mounted in a bath room for co-operation with the conventional bath tub and

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shown in elevated position above the tub, for lowering of a body into the tub for bathing;

Fig. 2 is a horizontal cross section taken on the line 2—2 of Fig. 1;

Fig. 3 is a vertical section taken centrally through the upstanding support-operating mechanism and chair with the same disposed in lowered position within the tub;

Fig. 4 is a cross section taken on the line 4—4 of Fig. 3;

Fig. 5 is a horizontal cross section taken on the line 5—5 of Fig. 3;

Fig. 6 is a top plan view of the two-section supporting structure showing a control mechanism for opening the seat-lowering valve;

Fig. 7 is a view mostly in side elevation with some parts shown in vertical section, illustrating another embodiment of the invention mounted on the wall for horizontal shifting movement transversely of the tub; and

Fig. 8 is a top plan view with some portions broken away, showing the structure illustrated in Fig. 7;

Referring now to the form of the invention illustrated in Figs. 1 to 6 inclusive, an embodiment of my apparatus is shown as operatively installed in a corner of a bath room above one end of a tub T, being supported as shown for swinging movement in an arcuate line of travel transversely of the tub through a suitable medium such as the vertically spaced, angled supporting brackets 10 and 11, to which horizontal supporting arms 12 and 13 are pivotally connected through heavy hinge pintles 12a and 13a respectively. An upstanding, two-section support or post is connected with the horizontal supporting arms 12 and 13, comprising as shown, a pair of complementary, heavy sheet metal channel members 14 and 15 respectively, the inner or rear channel member 14 being rigidly secured at its top and adjacent its bottom ends to the rigid supporting arms 13 and 12. Connection of the arms 12 and 13 is made with the rear or intermediate web of channel member 14 by welding or otherwise rigid and durable structure. The outer channel member 15 is compactly telescoped about channel member 14 with the intermediate web thereof disposed forwardly of the supporting post structure and covering or partially covering the open face of the channel 14. I prefer for reinforcing and connection purposes, to provide the outer telescoping section 15 of my supporting structure with inturned longitudinal flanges 15a which overlies the rear corners of the back web of inner channel section 14.

To facilitate substantially vertical adjustment

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of the outer channel section 15 upon the inner section 14, I provide two sets of rollers between opposing faces of the two sections adjacent the forward side of the supporting structure. To this end, as shown in Figs. 3 and 4, a short, transverse roller shaft 16 is journaled or otherwise mounted in the opposing parallel legs of inner channel member 14 adjacent the lower end thereof and has mounted thereon, a pair of spaced rollers 16a having the forward portions of their periphery extended somewhat beyond the inner, reinforced flanges 14a at the forward open face of channel 14. Rollers 16a carried by the inner channel bear against the inner surface of the intermediate and forward web of the outer channel 15.

The second pair of adjustment-facilitating rollers as shown in Figs. 5 and 3, is mounted on a short, transverse roller shaft 17 which extends through a bore formed in a thick attachment block 18, bolted by a bolt 19 or otherwise rigidly affixed to the intermediate web or outer face of the outer channel section 15 and disposed adjacent the upper end of said outer channel section.

The two rollers 17a mounted on shaft 17 of the outer portions of their peripheries, bear against longitudinally extending grooved seats 14b which throughout at least the upper half of the inner channel member 14 are formed by L-shaped flanges connected with the wider and side faces or legs of the inner channel section 14 (see Fig. 5).

A body support, seat or chair is mounted upon the lower portion of the outer channel section 15, having as shown a generally rectangular and horizontal seat frame 20 which may conveniently be constructed from rigid tubular material and which has its rear and as shown, somewhat diminished end 20a affixed to a relatively wide depending supporting hook 21 welded or otherwise rigidly affixed to the front face of intermediate web and lower portion of the outer channel section 15. Seat frame 20 may conveniently have stretched longitudinally over the ends thereof, a flexible seat-forming fabric 20c. The support as shown, includes a pair of diagonal bracing members 22 interconnected at their upper ends preferably by integral tubular construction with a horizontal top member 22a which is welded or otherwise rigidly affixed to the intermediate portion of the forward, upstanding face of the outer channel section 15. If the diagonal members 22 are integrally formed with the top piece 22a, the ends of the tubular members may be bent to form horizontal sections 22b which are rigidly interconnected as by welding with the tubular side pieces 20b of the support frame and thereafter, may be bent diagonally and upwardly and thereafter, curved and bent rearwardly to form chair arms 22c to protect and assist in retaining the user upon the support 20.

A flexible back rest fabric 22d in envelope form may be stretched across the upper U-shaped portion of the diagonal structure comprising the arms 22 and the top piece 22a, as shown in Fig. 2.

Efficient and readily operable elevating means are housed preferably within the confines of the telescoped channel sections 14 and 15 and preferably, but not necessarily, comprise a hydraulic jack mechanism having a substantially vertical fluid cylinder 23 rigidly affixed as by welding at its lower and somewhat reduced end 23a to the inner face of the mounting block 18 rigidly affixed

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to the intermediate and forward web of the outer channel section 15. The upper and enlarged portion of cylinder 23 contains a hydraulic fluid while the lower somewhat reduced portion thereof acts as an elongated slide bar for receiving the hydraulic piston rod 24 which extends downwardly therefrom and has its lower end removably affixed as shown, by a bolt 24a to a transverse mounting block 25 welded or otherwise rigidly affixed within the lower portion of the inner channel section 14 at a short distance above the lower end thereof and above the rollers 16a carried by the inner channel section.

The hydraulic jack is for the most part, of conventional hand pump construction, having a threaded air release valve 26 in the upper end of cylinder 23 and is provided with a laterally and forwardly extending lever or pump handle 27 extending at some height above the top of the support or chair with the inner end of said handle fulcrumed between suitable lugs 23b provided at the lower end of cylinder 23 and having connection (not shown) in conventional manner with a check valve controlled piston mounted interiorly of the cylinder. The pump handle 27 for convenience of the user may have hinged to the outer end thereof, a depending straight handle extension 27a which terminates in a hand grip 27b disposed adjacent the back of the chair formed by the frame 22. The action of the pump is to inject from the hydraulic contents of cylinder 23, fluid above the top of the piston rod 24 for elevating the cylinder and the outer post channel 15 which is rigidly connected therewith.

I prefer to provide means controllable by the user for facilitating opening and closing of the air release valve 26. To this end, as shown in Figs. 1, 3 and 6, the stem of the valve 26 is provided with a radial lever arm 26a which is connected at its outer end by a flexible cable 28, with a small pull knob 29, shown as mounted on one of the arms 22c of the chair. The cable or cord 28 as shown, extends downwardly and forwardly from the lever arm 26a of the valve, passes through a smooth guide formed in a guide arm 30 and then extends downwardly through one of the diagonal tubular portions 22 of the chair back and passes forwardly through the arm 22c and then upwardly through an aperture cut in the rear portion of said arm and is secured to the knob 29. An upward pull upon the knob 29 opens valve 26 against the yielding action of a coil spring 31 which has one end connected with the rear portion of the lever arm 26a and has its other end secured to a retaining lug 31a mounted on the top of cylinder 23.

It will be noted that with my structure, the two-section, upstanding support is mounted in somewhat declined relation to the vertical and with the cooperation of the short horizontal supporting arms 12 and 13, and the spaced wall brackets 10 and 11, may be conveniently attached to a wall of the bathroom adjacent one end of the tub (preferably the lower end) and may be swung to the dotted line position shown in Fig. 2, where the greater portion of the support or chair is disposed outwardly of the bath tub and furthermore, may be swung over the end of the tub to the full line position shown in Fig. 2 and thereafter, lowered to the bathing position shown in Fig. 3.

Operation

In use, the invalid, through the use of a wheelchair, assistance or cane or crutches, is able to shift his weight to the support afforded by the

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four-sided frame 20 with his limbs extending forwardly and in most instances with his torso disposed between the arms of the chair and supported by the flexible back. Thereafter, with the assistance of his hands or legs, or if necessary, with the assistance of an attendant, the supporting structure with the weight of the invalid thereon is swung over and above the lower end of the tub to the position shown in Fig. 1. Thereafter, the user may release the valve 26 slightly to let out air from the upper portion of the cylinder and produce a gradual lowering of the outer channel section 15 of the support relative to the inner channel section 14. In the form shown, this may all be controlled by the user by pulling upon the valve control knob 29. Upon release of the knob, valve 26 is closed and the chair with the weight of the user's body thereon, is retained in the desired adjusted position such as for example, the lowered position for bathing shown in Fig. 3.

Upon completion of the bath, the user, assuming he or she has the control of at least one arm, may actuate the pump handle 27 from the depending auxiliary rod 27a to reciprocate the pump, forcing fluid against the top of the piston rod 24 to elevate the cylinder 23 since the lower end of piston rod 24 is fixed to the fixed support block 25 secured to the inner channel section 14 of the supporting post. This action progressively elevates the outer channel section 15 rigidly secured to cylinder 23 to a point where the bottom of the invalid supporting structure 20 is disposed above the top edge of the tub, as shown in Fig. 1. Thereafter, the invalid or an attendant may swing the entire supporting structure and post structure to the position shown in dotted lines in Fig. 2 for delivery of the user at the side of the tub.

From the foregoing description, it will be seen that I have provided a compact, rugged device or apparatus for enabling an infirm person to get into and out of a conventional bath tub without requiring the support of his weight on his own limbs alone. It will further be seen that with my structure in most cases, the invalid may pull and draw himself to the support under his own power, thereafter control the swinging of the supporting structure and lowering of his body into the tub for bathing, as well as control the subsequent elevation and shifting of the support to get out of the tub.

It will further be seen that with my structure, the device may be readily applied to a vertical supporting wall in the bath room without requiring expensive and bulky supporting pedestals, davits or other suspension means. The entire elevating mechanism is compactly mounted within the hollow, double channel post and is not in an obstructing position or one requiring additional space in the bathroom. The combination of the two-section post with its supports for transverse shifting movement enables the post to be swung or slid as the case may be in very close position to a supporting wall but to nevertheless align the lower end of the post inclined from the vertical for lowering of the invalid support into the tub.

In Figs. 7 and 8, I illustrate another form of the invention applied to a conventional bath tub wherein the two-section supporting post structure and the invalid support or chair carried at the lower end thereof, is slidably shiftable along a track secured to the wall in a transverse, elevated position above the lower end of the tub.

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In this second form of the invention, the supporting post structure comprising inner and outer channel sections 14 and 15, the hydraulic operating mechanism, the invalid support 20 and chair structure and controls, are all identical with the structure shown in Figs. 1 to 6 and therefore, do not require detailed description. I have not illustrated the pump handle for actuating the hydraulic mechanism or any means for facilitating opening of the air release valve.

In place of the swingable mounting for the two-section channel support post, I provide in this second form, an upper roller-equipped bracket 35 having a depending attachment arm 35a which is welded or otherwise rigidly secured to the rear face or intermediate web of the inner post channel 14 and which has angularly positioned and integrally formed therewith at its upper end, a roller carrying head 35b which is confined within a suitable, substantially horizontal track made up of a pair of channel sections 36 and 37 respectively. The head 35b is inclined from the horizontal and carries adjacent its ends, pairs of rollers 38 disposed on opposite sides of the head and having the edges thereof bearing against the longitudinal, turned flanges or portions of the track sections 36 and 37, as clearly shown in Fig. 7. Thus, it will be seen that the two-section post structure is supported in a position declined from the vertical and that the support and thrust is imposed upon the flanges or channels of track sections 36 and 37 in an outwardly and downwardly direction.

At the lower end of the two-section post, a rigid bracket 39 is affixed to the rear web or inner channel section 14 extending horizontally and rearwardly therefrom and terminates in a head somewhat similar to the head 35b of the first mentioned bracket which carries a pair of widely spaced rubber rollers 40 rotating on vertical axes and mounted for bearing against the bath room wall W.

With this last described form of my invention, the weight of the supporting structure and invalid is mainly taken by the supporting track comprising channel elements 36 and 37. The nature of the structure is such that a rearward thrust, when the invalid is supported, is imposed upon bracket 39 causing the rollers 40 to be thrust against the vertical wall W. Supporting post structure and chair as an integral unit, may readily be caused to slide from a position beyond one of the longitudinal sides of the tub to a position over the lower end of the tub. The operation of this hydraulic elevating and lowering mechanism is similar to that described in the first form of the invention.

It will of course be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of my invention.

What I claim is:

1. Invalid supporting and handling apparatus for bath tubs having in combination an upstanding supporting post comprising a pair of complementary channel members telescopically related to form a hollow structure, one being mounted on the other for adjustment vertically and longitudinally thereof, an invalid support secured to said adjustable channel member and extending forwardly and laterally thereof for disposition above the top of a tub and for immersion into the contents of a tub, mechanism interposed between said channel members for raising and lowering said adjustable channel member, mechanism

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connected with the other of said channel members for securing and supporting the structure from a vertical wall with said post declined from the vertical and with the upper end thereof disposed in close relation to said wall and with the lower end thereof aligned for lowering into the tub, said mechanism including means for shifting said structure generally in a line of travel transversely of a bath tub.

2. Invalid supporting and handling apparatus for bath tubs having in combination an upstanding supporting post comprising a pair of relatively longitudinally slidable sections, one being mounted on the other for vertical adjustment, an invalid support secured to said vertically adjustable section and extending forwardly and laterally therefrom for disposition above the top of a tub for immersion into the contents of a tub, mechanism interposed between said sections for raising and lowering said longitudinally movable section and for retaining the same in a variety of vertically adjusted positions, the other of said sections having brackets extending rearwardly therefrom and spaced widely apart throughout the length of said post and means for attachment to a vertical wall adjacent one end of said tub for connection with said supporting brackets to maintain said post in a position declined from the vertical where the lower end of said post may be shifted to be superimposed above the bottom of one end of a tub and where the upper end of said post is disposed in close relation to the wall.

3. The structure set forth in claim 2 wherein said brackets are substantially vertically aligned and have pivotal connection for support from the wall to enable said invalid support to be swung in close relation to the wall and to a position outside of the tub, while nevertheless, aligning the lower end of said supporting post for lowering into the tub.

4. Invalid supporting and handling apparatus for bath tubs having in combination an upstanding support mounted for shifting movement generally in a line of travel transversely of a bath tub, said support comprising a pair of relatively longitudinally slidable sections comprising complementary, elongated channel members forming together an enclosure, one thereof being mounted on the other for vertical adjustment, an invalid support supported from said vertically adjustable section for disposition above the top of the tub and for immersion into the contents of the tub, mechanism interposed between the sections of said supporting structure for raising and lowering said longitudinally movable section and for retaining said last mentioned section in a variety of vertically adjusted positions, said mechanism being housed within the confines of said enclosure formed by said supporting structure and having an operating element extending outwardly thereof for manipulation by the invalid or an attendant.

5. Invalid supporting and handling apparatus for bath tubs having in combination an upstanding post comprising a pair of complementary elongated channel members telescopically related to form a hollow structure, one being mounted on the other for adjustment vertically and longitudinally thereof, mechanism on the non-adjustable channel member for supporting connection with a vertical surface to permit shifting movement of said post generally in a line of travel traversing a bath tub, an invalid support secured to said adjustable channel member and extend-

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ing forwardly and laterally thereof for disposition above the top of a tub and for immersion into the contents of a tub and jack mechanism mounted within the hollow structure defined by said complementary channel members and having elements interposed between said vertically adjustable and non-adjustable sections whereby said invalid support may be elevated and lowered and retained in a multiplicity of elevated positions.

6. The structure set forth in claim 5 wherein said jack mechanism is of the hydraulic type and includes a reciprocating pump handle extending outwardly of said post structure for accessibility to the user.

7. Invalid support and handling apparatus for bath tubs having in combination an upstanding supporting post comprising a pair of relatively longitudinally slidable sections, one being mounted on the other for vertical adjustment, an invalid support secured to said vertically adjustable section and extending forwardly and laterally therefrom for disposition above the top of a tub and for immersion into the contents of a tub, mechanism interposed between said sections for raising and lowering said adjustable section and for retaining the same in a variety of vertically adjusted positions, the other of said sections having mechanism for supporting said post in a position declined somewhat from the vertical, from a vertical supporting surface, said mechanism comprising at the upper portion of said non-adjustable post section, a bracket carrying a pair of widely and horizontally spaced rollers and a track for attachment to a vertical supporting surface in which said rollers ride and are supported and confined, said supporting mechanism further including roller means connected with the lower portion of said non-adjustable post section.

8. Invalid supporting and handling apparatus for bathtubs having in combination an upstanding hollow post comprising a pair of complementary elongated channel members, telescopically and slidably related for relative vertical adjustment, mechanism on one of said channel members for supporting connection with a vertical wall or the like to permit shifting movement of said post generally in a direction transversely of one end of the bathtub, an invalid support secured to the adjustable channel member of said pair and extending forwardly and laterally thereof for disposition above the top of a tub and for immersion into the contents of a tub and jack mechanism mounted within the hollow structure defined by said complementary channel members and having elements interposed between said two complementary members whereby said invalid support may be elevated and lowered and retained in a multiplicity of elevated positions and means extending exteriorly of said posts for operating said jack mechanism.

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