March 3, 1964 K. H. PAULSON 3,123,400

INVALID'S CHAIR

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FIG. 1.

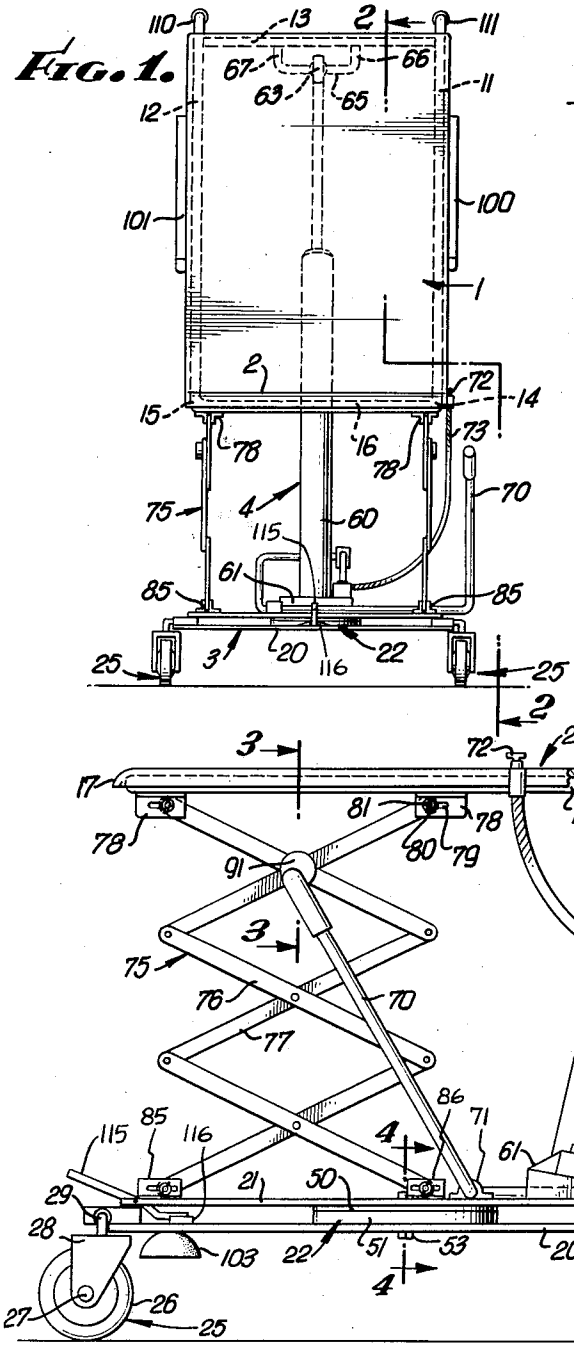


FIG. 2.

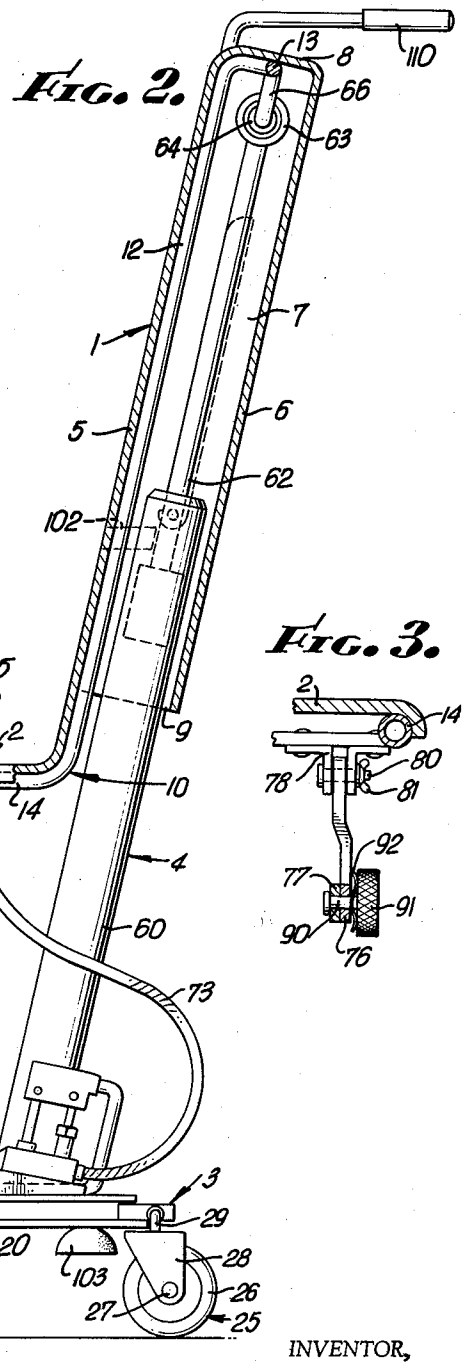
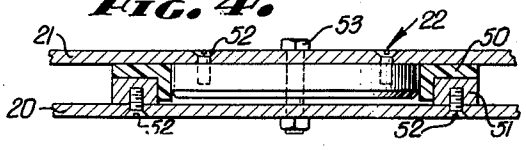


FIG. 3.

FIG. 4.



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FIG. 6.

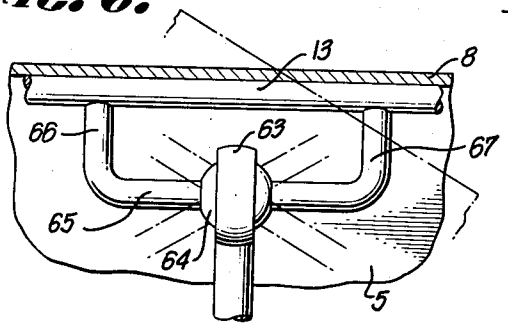
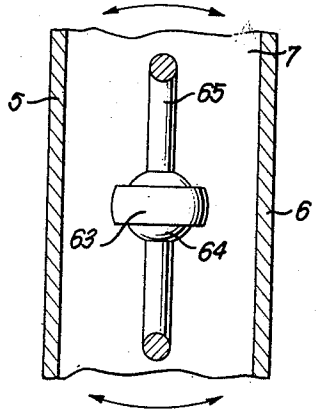


FIG. 5.

FIG. 7.



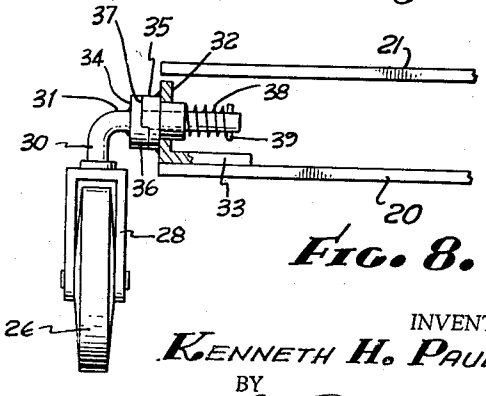


FIG. 8.

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INVALID'S CHAIR

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3 Claims. (Cl. 297—314)

The present invention relates to a chair particularly adapted for use by incapacitated, handicapped, invalids and aged persons. The chair of the invention is so constructed as to be readily operated by the persons named, whereby said person may raise or lower the chair, rotate the chair seat and back through 360°, tip the seat and back sideways. The person utilizing the chair may move the chair adjacent a bed, conform the chair seat to the height of the bed for transfer to the bed, or in certain other adaptations move the chair adjacent a bathtub and turn and tilt the chair so that the person may have ready access to the bathtub and further utilize the chair by transferring the same into the bathtub to lower the person within water in said tub.

An object of the invention is to provision of a chair, particularly adapted for incapacitated persons which may be manipulated by the person occupying the chair to raise or lower the chair seat or to tilt and revolve the chair seat.

A further object is to provide a chair which is light in weight so as to be conveniently handled without assistance by an incapacitated person.

I include within the term "incapacitated" all persons who are suffering from any physical disability, which makes walking or movement difficult except when assisted.

Further objects include an invalid's chair of simple, foolproof construction, of few parts, inexpensive in cost of manufacture and generally superior to chairs for the purpose intended now known to the inventor.

With the above and other objects in view, the invention consists in the novel and useful provision, formation, construction, association and relative arrangement of parts, members and features, all as shown in a certain embodiment in the accompanying drawings, described generally and more particularly pointed out in the claims.

In the drawings:

FIGURE 1 is a front elevation of the chair of the invention;

FIG. 2 is a cross sectional view, on an enlarged scale, taken on the line 2—2 of FIGURE 1;

FIGURE 3 is a fragmentary sectional view, on an enlarged scale, taken on the line 3—3 of FIGURE 2;

FIGURE 4 is a fragmentary sectional view, on an enlarged scale, taken on the line 4—4 of FIGURE 2;

FIGURE 5 is a sectional view similar to that of FIGURE 2, the chair seat and back being in a lowered position;

FIGURE 6 is a fragmentary enlarged sectional view on the line 6—6 of FIGURE 5;

FIGURE 7 is a fragmentary sectional view, on an enlarged scale, taken on the line 7—7 of FIGURE 5; and,

FIGURE 8 is a fragmentary sectional view on an enlarged scale, taken on the line 8—8 of FIGURE 5.

Referring now to the drawings and specifically to FIGURES 1, 2, and 5, the chair of the invention includes a back 1, seat 2, wheeled chassis 3 and a hydraulic jack 4 between the back and the wheeled chassis for use in elevating or lowering the seat and back relative to the wheeled chassis.

The back 1 includes a front panel 5, a rear panel 6, side panels 7, between the front and rear panels and a top panel 8 joining the front, rear, and side panels. This provides an enclosure wherein access is afforded between the panels by the bottom opening at 9. The seat 2 and

the back 1 are held in working relationship by a tubular frame 10 which is bent so as to provide within the back two side members 11 and 12 adjacent the front panel 5 and side panels 7 and a transverse member 13 adjacent the top panel 8 and joined with the side members 11 and 12. The tubular frame is bent to provide a supporting structure for the seat 2 which frame in the present instance is substantially U-shaped in that it has two members adjacent the sides of the seat as shown at 14 and 15 and a front member 16 joining the side members. This tubular frame may be formed from any suitable material such as steel, duraluminum, etc. It is important that the tubular frame should be strong enough to withstand bending stress particularly when the seat and back is raised or lowered by the hydraulic jack 4. It will be noted that the seat 2 is provided with a reverted edge flange 17 adjacent the tubular frame members 14, 15 and 16. At the present time I have not mentioned padding the seat as this is not a part of the invention and will depend for its presence upon a particular manufacturer.

The wheeled chassis 3 includes a base plate 20 formed from a suitable material such as steel, a top plate 21 spaced above the base plate 20 and parallel thereto with pivot means 22 between said plates whereby the top plate 21 which constitutes a turntable as hereinafter set forth may be rotated relative to the base plate 20. The wheeled chassis includes casters designated generally as 25 adjacent each corner of the base plate 20, assuming that the base plate is rectangular in outline. All of the casters are identical and each caster includes the usual wheel 26 mounted for rotation on an axle 27 carried in a U-shaped stock 28. A bent pin 29 is secured to the stock in such a manner as to permit swiveling action of the wheel and stock, one leg 30 of the pin being perpendicular to the axle 27 while the other leg 31 is at right angles to leg 30. Leg 31 is passed through flange 32 of an angle bracket 33. The angle bracket is fastened to the base plate 20.

A disk coupling is provided between the flange 32 and the leg 31. The disk coupling comprising disks 34 and 35, each disk having a raised segmental face portion 36 and 37 which interlock in the position shown in FIGURE 8 or which may be separated so as to allow a relative turning movement between the disks. The disk 35 is fastened to the flange 32 while the disk 36 is fastened to leg 31. Leg 31 is surrounded by a coil spring 38 one end of which bears against the inner surface of the flange 32 while the opposite end is held by a cotter pin 39 passed through the leg. When a wheel is swung above the base so as to be out of floor engagement the segments for the two disks are separated so that the segmental enlargements are in face engagement, the spring 38 being compressed. This compression is sufficient to hold a caster in elevated position. However, when the caster is swung downwardly to be in floor engagement, the two segments or abutments interlock as shown in FIG. 8, the spring 38 moving the leg 31 inwardly to hold the caster in a stable position.

The top plate 21 acts as a turntable for the seat and back of the chair to permit rotation thereof through 360°. The pivot means 22 is detailed in FIGURE 4 and includes a friction type bearing between the base 20 and the top plate 21. The friction type bearing includes two annular members 50 and 51 each separately secured to members 20 and 21 by suitable means such as by screws 52, the bearing member 50 being right angular in radial section for receiving the annular bearing 51. Any form of friction material may be utilized common to the market. Preferably the pivot means 22 should be of large diameter to give stability to the structure and prevent, as far as possible, tipping movement of the turn-

table 21 relative to the base member 20 when load is imposed on the chair. The bearing is held together by a center bolt 53.

For raising and lowering of the chair seat and back, I provide a hydraulic jack 4 which includes a cylinder 60 one end of which is carried in a casting 61 for a fluid reservoir and a pump. Within the cylinder is the usual piston carrying a piston rod 62 the upper end of the piston rod 62 being provided with a rod end bearing comprising a head 63 in the form of an eye member having a universal movement upon an apertured ball 64 within the head. A U-shaped tubular member 65 has one leg passed through the aperture of the ball, see FIGURE 1, while the aligned parallel end legs 66 and 67 are secured to the framing member 13 in any suitable manner such as by welding.

I have not detailed any specific type of hydraulic jack, although for this invention I make use of a hydraulic jack of the type which is hand operated and manufactured by Blackhawk Manufacturing Company of Milwaukee, Wisconsin. The particular jack utilizes a hand lever 70 at one side of the wheeled chassis, as shown in the figures and which hand lever is suitably mounted in bearing blocks 71 for pumping fluid within the cylinder 60 to raise the piston and piston rod. A valve release 72 is positioned at the side of the chair seat, there being a flexible tube 73 between said valve and the reservoir for the hydraulic jack whereby the chair seat and back may be lowered, the piston rod moving downwardly within the cylinder.

I provide a chair seat stabilizing means between the chair seat and the turntable. This stabilizing means includes an identical pair of spaced apart lazy tongs designated generally as 75 and each set includes the usual equal length jointed levers 76 and 77, the ends of the uppermost levers being received between pairs of brackets 78, of which there are two pairs for each side of the chair, secured beneath and to the seat 2. Each pair of brackets is slotted longitudinally, as shown at 79 with the ends of the levers secured between said brackets by means of bolts 80 carrying wing nuts 81, the bolts sliding within the slots 79. The ends of the lowermost levers of the lazy tongs are pivotally connected by means of brackets to the turntable, as shown at 85 and 86. These brackets are identical with the top brackets 78 in construction. As stated, there are two sets of lazy tongs, one for each side of the chair and connected to the turntable 21. By forming the levers of the lazy tongs of relatively stiff material, side sway of the chair seat relative to the turntable is effectively controlled. I further control seat movement during elevation and lowering in the manner shown in FIGURE 3 wherein the uppermost pair of levers at the point of crossing thereof, are frictionally held together. The friction means includes a bolt 90 passed through openings in the two topmost levers and carrying a knurled head 91 with a sinuous leaf spring 92 interposed between a knurled head and a lever. This sinuous leaf spring takes the form of a washer and the knurled head or knob may be tightened upon the threads of the pin 90 to regulate the friction exerted by the spring against a lever.

My chair construction includes a pair of arms 100 and 101 revolubly pinned to the sides of the back so as to assume either a vertical or horizontal position, as illustrated in FIGURES 1 and 5 and which arms contact supporting blocks designated generally as 102 when the arms are in a horizontal position. In addition, the base plate 20 is provided with friction cups designated generally as 103 for supporting the chair as against slippage when the casters are moved from the position of FIGURE 2 to that of FIGURE 5. The friction cups are of particular use in a bathtub, as shown in FIGURE 5.

The operation, uses and advantages of my invention are as follows:

The particular chair of my invention is portable, of light weight, occupies small space, with the patient able to easily handle the same. All movable elements of the chair may be controlled by the occupant thereof thus when the patient occupies the chair seat the patient may, himself, move the chair upon the casters, or the chair may be moved by an attendant who may grasp arms projecting from the chair at the top thereof, as shown at 110 and 111. When the chair is in an elevated position, as shown in FIGURES 1 and 2, sideways tipping of the chair seat is counteracted, or such movement is resisted by the lazy tongs 75. Forward tipping of the seat is counteracted by the cylinder 4 of the hydraulic jack as said jack is fixedly connected to the pump casting and to the turntable 21 at one end, while the opposite end thereof is partially confined between the panels 5 and 6. Thus any tipping movement of the chair seat or back will bring the panels 5 and 6, one or the other, into engagement with the cylinder to restrain rocking or tipping movement. The construction of the lazy tongs also assists in this regard. Side swiveling or tipping of the chair seat and back is permitted to a limited degree, as shown in FIGURE 7, by the rod end bearing and its connection with the back through the members 65 to 67 inclusive and the connection therewith of the tubular framing for the chair. This swiveling or turning movement is further illustrated in FIGURE 6 by the dotted line positions indicated in said figure. If the chair is to be tilted rather than rotated through 360°, the lazy tongs may be released from the chair seat by removing the wing nuts and pins connecting the upper ends of the top levers from the brackets, see FIGURES 2 and 3. This allows tipping of the chair sideways, the rod end bearing permitting said tipping. Full rotation of the chair is accomplished without releasing the upper ends of the lazy tongs from the brackets carried by the chair seat. Rotation of the turntable is controlled by the chair occupant operating a latch 115 carried by the turntable and adapted to engage a keeper 116 when the chair is facing forwardly, or in the position of FIGURE 2. Depressing the free end of the pedal lifts the other end of the pedal from engagement with the keeper and allows turntable rotation to any position desired and secures the chair when the pedal again engages the keeper. The occupant of the chair seat may be rolled to or adjacent a tub such as indicated in FIGURE 5, at 120, which tub is partially filled with water 121. When the occupant of the chair is adjacent the side of the tub, he may swing the arms 100 and 101 upwardly and either rotate or tip the seat and back towards the rim of the tub, assuming that the seat is at a height equal to the rim of the tub. The occupant may then sit on the rim of the tub and lift the chair over the rim and into the tub. Preferably the casters have been moved from their rolling position of FIGURE 2 to the position shown in FIGURE 5 whereupon the occupant of the chair may press the valve 72 to release pressure and cause the seat to lower to the position shown in FIGURE 5, collapsing the lazy tongs. The cups will engage the bottom of the tub so that there will be no shift of the chair which might in any way disturb the chair occupant. After a given bath or other water therapy, the patient may, by rocking the lever 70, manually actuate the hydraulic jack to raise the chair seat to the position shown in FIGURE 2, whereupon the patient may again sit on the rim of the tub and lift the chair from the tub, of course, swinging the casters beneath the base 20 or to the position shown in FIGURE 2, the casters being held in either upper or lower position. The chair may then be pushed either by the occupant or by an assistant to a new location. The chair may be fabricated from light material having a strength sufficient to carry the weight of the average person which hardly ever exceeds, in the case of an incapacitated, or handicapped person more than 200 pounds. I have found that the chair itself may weigh ten or twelve pounds when assembled, and

such weight is easily handled by a child of average strength.

I claim:

1. An invalid's chair including a wheeled chassis, a turntable mounted for rotation on said wheeled chassis, a chair comprising a seat and a back, a hydraulic jack between the back and the turntable, said hydraulic jack including a cylinder fixedly secured at its lower end to the turntable, a piston in said cylinder, a pump for pumping fluid within the cylinder to raise the piston, a piston rod secured to the piston, means between the piston rod and the chair back to permit limited sidewise tipping of the chair, said chair back being provided with spaced apart front and rear panels and narrow side panels joining the front and rear panels and terminating short of the lower end of the cylinder, stabilizing mechanism between the chair seat and the turntable to resist said tipping of the chair, and means conveniently located with respect to a person seated in the chair for controlling the up and down movement of the piston and the chair.

2. The device of claim 1 in which the means between the piston rod and the chair back includes a frame serving as a supporting structure for the seat and back of the chair, a U-shaped member joined to the frame centrally

of the top of the back of the chair, and an apertured ball centrally of said member, and an eye member mounted at the upper end of the piston rod, universally mounted on the ball.

3. The device of claim 1 in which the stabilizing mechanism includes a pair of lazy tongs extending between the chair and the turntable on opposite sides, and a manually controlled spring friction device passing through the junction of the uppermost pair of the levers of each lazy tongs to adjust the amount of friction exerted against movement of the lazy tongs.

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