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3,203,009

PATIENT LIFT

Filed Dec. 4, 1963

4 Sheets-Sheet 1

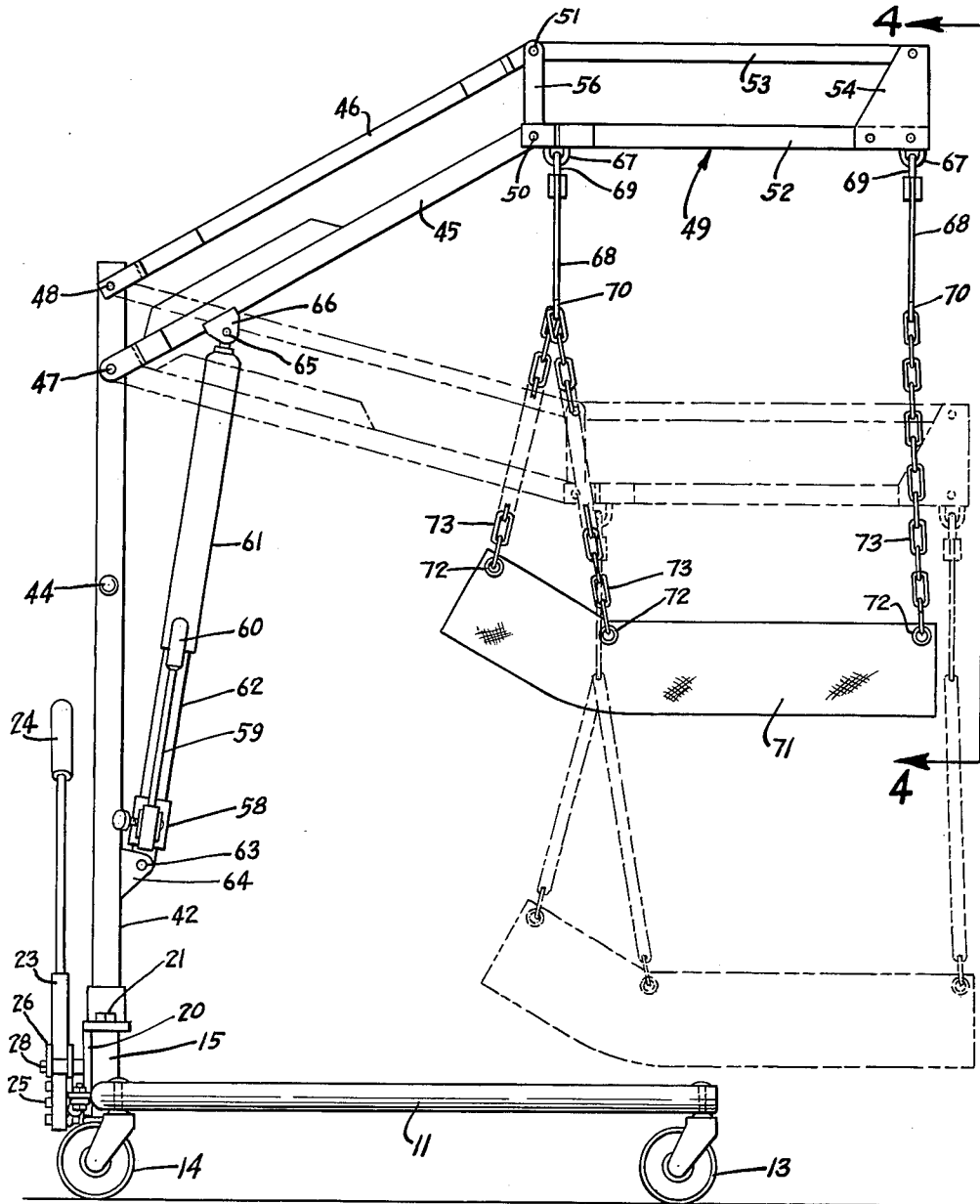


FIG. 1

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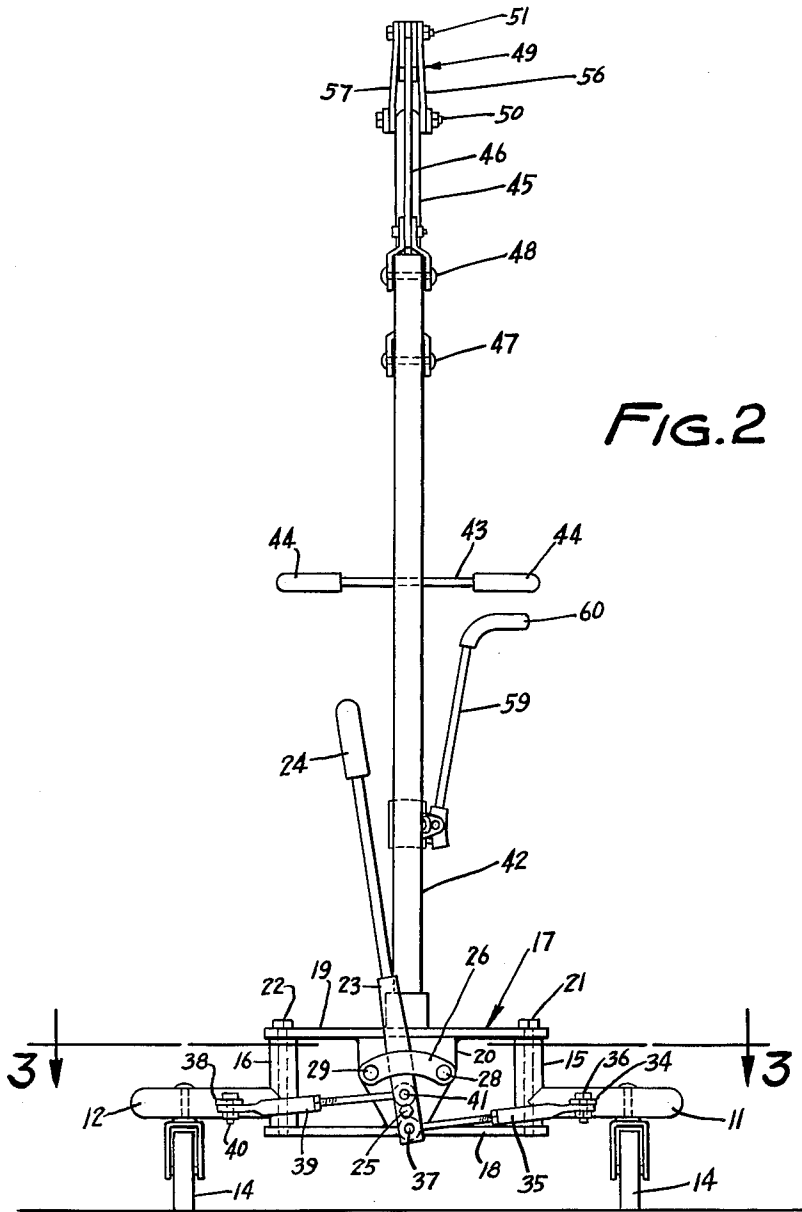


FIG. 2

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4 Sheets-Sheet 3

FIG. 3

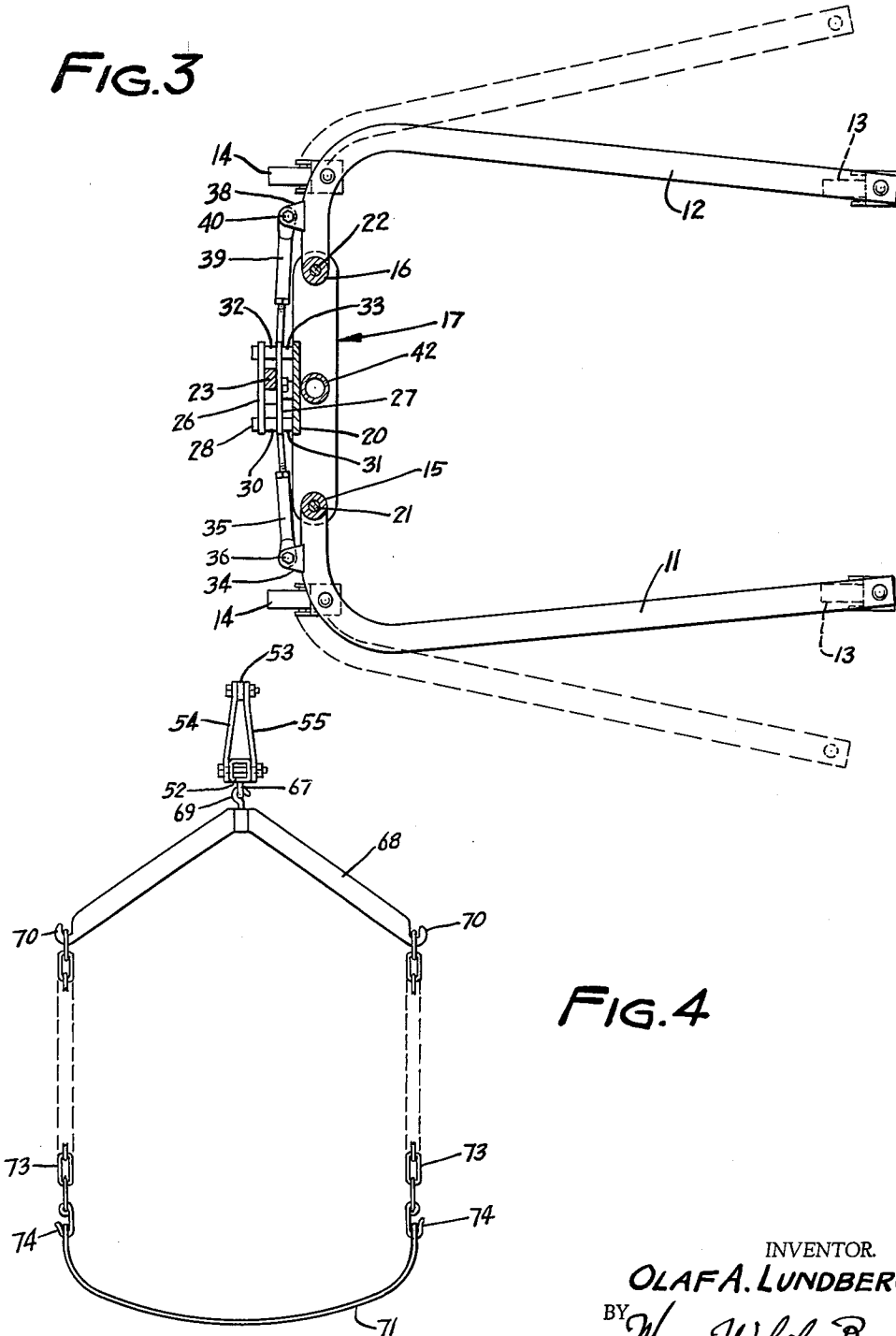


FIG. 4

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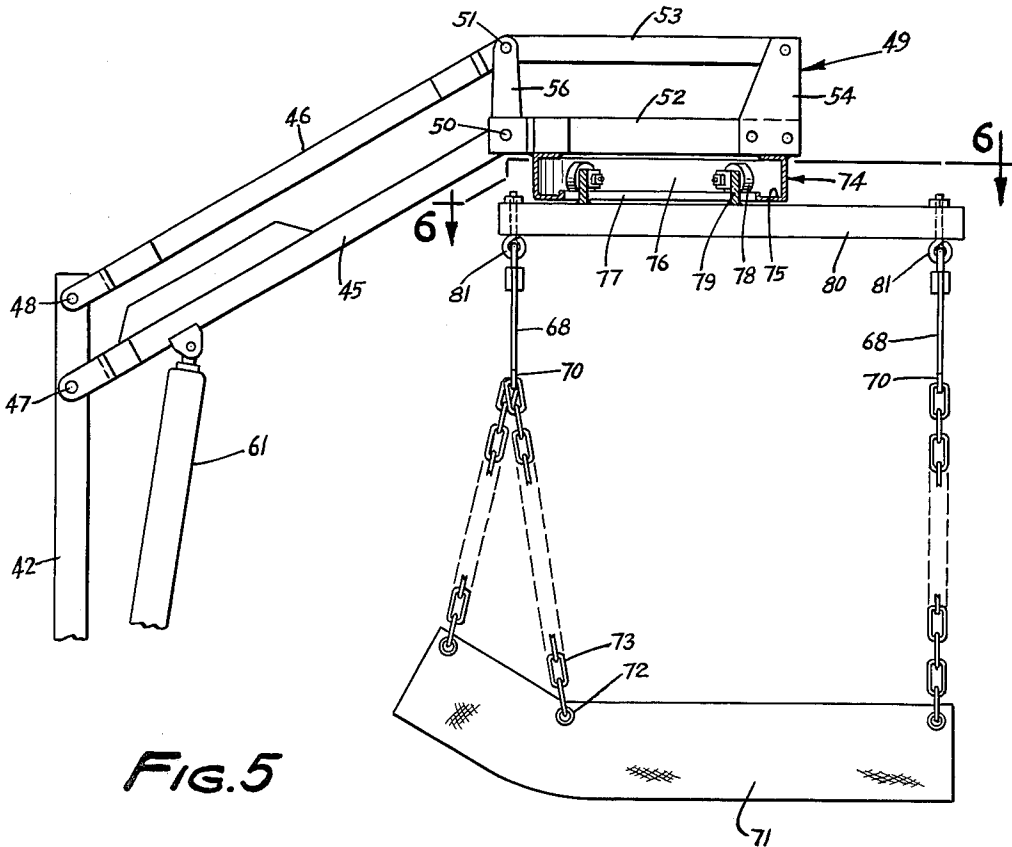


FIG. 5

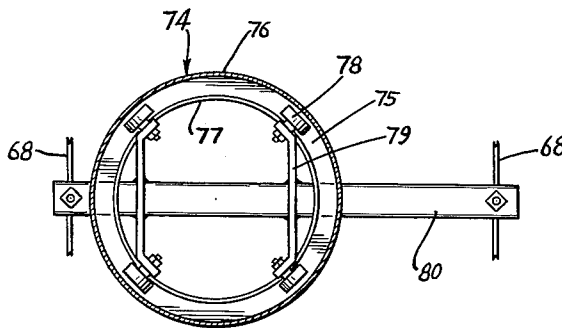


FIG. 6

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PATIENT LIFT
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 Filed Dec. 4, 1963, Ser. No. 327,895
 4 Claims. (Cl. 5—81)

This invention relates to means for lifting and carrying incapacitated persons, such as invalids, hospital patients and the like. More particularly, this invention relates to a modified and improved patient lift and carrier of greater versatility and usefulness, especially in enabling such patients to be bathed.

The principal object of the present invention is to provide a patient lift and carrier which is capable of lifting a patient while providing substantial longitudinal support for his body, carrying him and lowering him with maximum ease and safety and minimum discomfort to the patient.

Other objects of the invention will become apparent as the description proceeds.

To the accomplishment of the foregoing and related ends, this invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

The invention is illustrated by the accompanying drawings in which the same numerals refer to corresponding parts and in which:

FIGURE 1 is a side elevation of the patient lift according to the present invention shown with a patient carrying sling in a raised position and showing the lift in broken lines in a lowered position;

FIGURE 2 is a left end elevation;

FIGURE 3 is a horizontal section on the line 3—3 of FIGURE 2;

FIGURE 4 is a right end elevation of the patient supporting yoke and sling suspended from the lift arm;

FIGURE 5 is a partial side elevation of the patient lift shown with a swivel support for the patient carrying sling; and

FIGURE 6 is a partial section on the line 6—6 of FIGURE 5 and in the direction of the arrows.

Referring now to the drawings, the patient lift according to the present invention comprises a generally U-shaped horizontal base frame including a pair of elongated arms 11 and 12. Each of arms 11 and 12 extends horizontally and is provided with a forward caster 13 and rearward caster 14, each of which is swivel mounted for easy maneuvering and movement of the lift. The rearward ends of arms 11 and 12 are bent inwardly and are provided with relatively short vertical standards or posts 15 and 16, respectively, welded to the arms, by which the arms are pivotally mounted in a body frame, indicated generally at 17.

The body frame 17 includes a lower horizontal laterally extending plate 18 and a corresponding spaced apart upper plate 19. A centrally disposed vertical plate 20 extends between horizontal plates 18 and 19 adjacent their rearward edges. Vertical post 15 of arm 11 is disposed between plates 18 and 19 of the body frame adjacent one end and secured thereto for pivotal movement by means of a pin or bolt 21. Arm 12 is similarly pivotally mounted in the body frame by means of a pin or bolt 22.

The arms 11 and 12 thus extend forwardly from the body frame 17 and are adapted to be pivoted in the body frame 17 to spread apart the free ends of the arms. This

is in order to permit the lift to straddle one end of a bed or a bath tub or the like in order to facilitate lifting of a patient and deposit of a patient after being lifted and carried. The free ends of the arms are then adapted to be brought closer together in order to make easier the transport of the patient by pushing of the lift and carrier, particularly where the patient is to be moved through narrow doorways and the like.

Spreading of the arms and return of the arms to their more closely spaced position is accomplished by movement of a lever 23 by its handle 24. Lever 23 is pivotally attached to the rearward face of plate 20 by means of a pivot pin or bolt 25. Movement of lever 23 is limited to a vertical plane by means of a pair of spaced apart arcuate straps 26 and 27 which are secured to vertical plate 20 by means of bolts 28 and 29 and held spaced apart from each other and from plate 20 by means of spacers 30, 31, 32 and 33. Bolts 28 and 29 and spacers 30 and 32 also serve to limit the extent of movement of lever 23 in its vertical plane.

The rearward edge of arm 11 is provided with a generally horizontal projecting lug 34 to which an adjustable link 35 is pivotally attached by means of bolt or pin 36. The opposite end of adjustable link 35 is pivotally attached at 37 to lever 23 below the pivotal attachment 25 of the lever to plate 20. Arm 12 is similarly provided with a rearwardly projecting horizontal lug 38 to which an adjustable link 39 is pivotally attached at 40. The opposite end of adjustable link 39 is pivotally attached at 41 to lever 23 above the pivotal attachment 25 of the lever to plate 20.

When lever 23 is moved from left to right, as viewed in FIGURE 2, force is transmitted through the links 35 and 39 to pull the lugs 34 and 38 of arms 11 and 12, respectively, toward one another. This causes the arms to pivot on their pivots 21 and 22, respectively, to assume the spread apart positions shown in broken lines in FIGURE 3. With the arms in this position, it is relatively easy for the lift to be wheeled into position straddling the legs of a free-standing hospital bed or a free-standing bath tub to facilitate movement of the patient. When lever 23 is moved in the opposite direction, the legs are again pivoted with their free ends being brought closer together.

The patient lift includes a vertical post or standard 42 centrally disposed in and supported by the body frame 17. Vertical post 42 extends a substantial distance above the body frame. At about arm level of a normal adult, there is provided a transverse horizontal crossbar 43 fitted with handles 44 to facilitate movement of the patient lift on its casters by pushing or pulling.

A lower elongated lifting arm 45 and a spaced apart parallel upper lifting arm 46 are pivotally attached to the upper end of vertical post 42 at 47 and 48 respectively. Arms 45 and 46 extend forward from the forward edge of post 42 and are movable together up and down on their pivots. A rigid rectangular patient supporting frame, indicated generally at 49, is pivotally secured to the opposite ends of arms 45 and 46 at 50 and 51, respectively. Arms 45 and 46, and frame 49 thus are positioned generally between and above arms 11 and 12 of the supporting base. Arms 45 and 46 are of approximately equal length and parallel. Pivots 50 and 51 are spaced apart by approximately the same distance as are pivots 47 and 48.

The rectangular frame 49 includes a lower longitudinally extending horizontal arm or bar 52 and a spaced apart parallel upper arm or bar 53. The forward ends of frame members 52 and 53 are held rigidly secured together by means of a pair of plate members 54 and 55. The rearward ends of the horizontal frame

members are similarly held rigidly secured together by means of a pair of vertical strap members 56 and 57. Although shown as an open frame, the supporting member 49 may obviously be of other construction so long as it is of rigid construction and pivotally attached to the parallel arms 45 and 46, as described.

The arms 45 and 46 form a parallelogram linkage between the vertical post 42 and the patient supporting frame 49. Whatever position arms 45 and 46 may assume, the vertical post 42 remains vertical and the patient support frame 49 remains horizontal.

The lifting arms and patient supporting frame are raised by means of a jack in the form of a hydraulic pump 58 manually operated by means of lever 59 and handle 60. Lever 59 operates the pump mechanism to pump fluid into a cylinder 61 to act upon a piston 62 in the conventional manner. The piston is pivotally attached at 63 in a projecting bracket 64 extending forward from the forward edge of vertical post 42. The free end of cylinder 61 is similarly pivotally attached at 65 extending downwardly from the bottom edge of arm 45 and spaced intermediate of the ends thereof.

As is well understood, when hydraulic fluid is pumped into the cylinder 61 to act upon the piston 62, the piston is forced out from the cylinder spreading the supporting brackets 64 and 66 apart. This causes arm 45 to be lifted and, because of the parallel linkage with arm 46, raises it as the two arms are maintained parallel. Because of the parallelogram linkage between vertical post 42 and the patient supporting frame 49, the frame 49 is maintained horizontal regardless of the position of the lifting arms. This enables the patient to be maintained in a substantially horizontal position while being lifted, carried and lowered so as to cause a minimum of discomfort to the patient.

The patient is carried in a sling supported from the frame 49. The lower bar 52 of frame 49 is provided with an eye member 67 adjacent its forward and rearward ends. An inverted V yoke 68 provided with a central supporting hook 69 is suspended from each of eyes 67. The opposite ends of yoke 68 are provided with supporting hooks 70. A patient sling 71 formed from strong flexible fabric material, such as canvas or the like, is provided with a plurality of grommets 72 adjacent its edges.

A plurality of lengths of chain 73, provided with hooks 74 at their lower ends to engage grommets 72, are suspended from the hooks 70 of the yokes 68 to support the sling and a patient carried therein. The patient may be lifted and carried in a flat horizontal position or, if desired, the head and shoulders may be slightly elevated (as shown in FIGURE 1) by shortening the rearwardmost chains 73. In any event, the patient has substantial support lengthwise of his body.

In FIGURES 5 and 6 there is shown a swivel mounting means for the patient carrying sling which increases the versatility and adaptability of the patient lift according to the present invention. A rotary swivel means 74 is secured, as by welding, to the bottom edge of the lower arm 52 of the supporting frame 49. In the form illustrated, the swivel 74 comprises a circular channel suspended from the supporting frame and having a generally horizontal and circular track portion 75 defined between the circular side wall 76 by which it is suspended and a circular retaining lip 77.

A plurality of rollers 78 journaled for rotation and mounted in generally horizontal support bars 79 are positioned within the swivel channel for movement along the circular track 75. The support bars 79 are positioned within the periphery of the channel, being suspended from the rollers which are retained in the channel by means of the retaining lip 77. An elongated horizontal bar 80 is secured to the support bar 79, being suspended under the swivel means with sufficient

clearance to permit rotation of the bar 80 on the rollers 78. The ends of bar 80 are provided with eyes 81 in order to receive and support yokes 68 to carry the sling 71. Bar 80 is located with respect to the swivel so that the approximate center of gravity of the patient carried in the sling will underlie the swivel means.

The lift with the swivel means is raised and lowered and the patient is transported in the same manner as already described. The swivel means provides greater versatility for the lift in receiving and depositing patients, however. In its normal carrying position bar 80 is aligned with the cantilevered arms 45 and 46 and supporting frame 49. However, under conditions in which the attendant can approach the patient's bed or a bathtub or therapy unit or the like only from the side the swivel permits the sling to be rotated into parallel alignment with the patient and the patient approached from the side. In all other respects the construction and the operation of the modified form of lift is the same. Instead of the particular form of swivel means shown other ring bearing type structures may be employed.

The patient lift, according to the present invention, provides a safe and comfortable lift for the patient. The hydraulic pump allows raising and lowering the sling at a gentle rate of speed without jolt or jar. It may be used to transfer a patient from bed to bed, or bed to wheel chair, or wheel chair to bed, or the like. It has been found particularly useful for bathing patients. The patient may be lifted from a bed, carried and lowered into a bath tub. The sling may be made from material non-absorbent with respect to water. In this instance, the sling may simply be left in the tube while the patient is bathed. The lift may likewise be used to place a patient in a whirlpool or similar hydrotherapy unit. By suitable adjustment of the chain lengths, the patient may be lifted and carried while prone, or supine, or seated.

It is apparent that many modifications and variations of this invention as hereinbefore set forth may be made without departing from the spirit and scope thereof. The specific embodiments described are given by way of example only and the invention is limited only by the terms of the appended claims.

I claim:

1. A lift and carrier for patients comprising

(A) a wheeled generally horizontal supporting base including

(1) a pair of horizontally extending spaced apart elongated arms which are open at one end and pivotally connected at the other,

(B) an elongated vertical standard extending upward from said base,

(1) said standard being centrally disposed between the arms of the base adjacent the pivotal connections of the arms,

(C) at least two parallel and vertically spaced apart elongated lifting arms of substantially equal effective length,

(1) each pivotally connected to said vertical standard a substantial distance above said base,

(2) extending from said standard above and between the extending arms of said base, and

(3) movable in a vertical plane to extend angularly outwardly from said standard,

(D) a generally constantly horizontal elongated rigid patient supporting frame,

(1) pivotally connected to each of said parallel lifting arms,

(2) extending from the ends of the lifting arms spaced from the standard above and between the extending arms of the base, and

(3) movable in a vertical plane with said lifting arms to remain generally constantly horizontal,

(E) Body supporting means for the patient suspended from said patient supporting frame,

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- (1) said body supporting means including
 - (a) an elongated horizontal supporting bar,
 - (b) swivel mounting means suspending said horizontal supporting bar from said patient supporting frame,

- (i) one end of said horizontal supporting bar extending beyond said swivel mounting means a greater distance than the other end of said bar,

- (c) at least two longitudinally spaced apart yoke members suspended from said supporting bar adjacent the ends thereof, and
 - (d) a flexible sling suspended from said yoke members by a plurality of flexible and substantially vertically extending connecting links, and

- (F) jack means pivotally connected to at least one of said parallel lifting arms to permit said arms to be raised.

2. A lift and carrier according to claim 1 further characterized in that

- (A) said extending arms of said supporting base are pivotally connected at opposite ends of a body frame member for limited rotation about a vertical axis,

- (B) a lever is pivotally attached to said body frame for limited rotation in a vertical plane transverse of the supporting base about a centrally disposed horizontal axis, and

- (C) a separate link is pivotally connected to each of said extending arms and to said lever on opposite sides of its axis of rotation, whereby said extending

arms may be spread apart and brought together upon movement of said lever.

3. A lift and carrier according to claim 1 further characterized in that said lifting arms comprise a pair of rigid parallel elongated metal bars of equal length whose pivotal connections to said vertical standard and said patient supporting frame are equally spaced, whereby said arms form a parallelogram linkage between the vertical standard and patient supporting frame to maintain the latter constantly horizontal.

4. A lift and carrier according to claim 1 further characterized in that said patient supporting frame is comprised of a pair of rigid parallel elongated metal bars rigidly secured together by connecting members in a rectangular frame lying in a vertical plane, the lowermost bar of said frame being provided with said swivel means for suspending a carrier for supporting the body of a patient therefrom.

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