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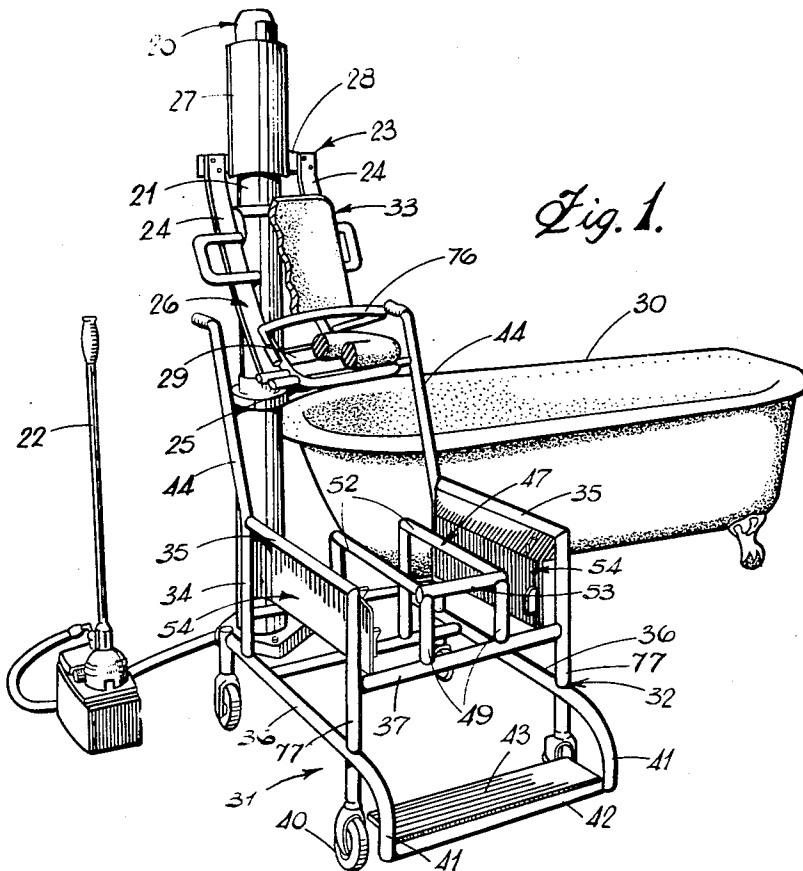
F. A. BATTY ET AL

3,220,575

APPARATUS FOR TRANSFERRING INVALIDS

Filed Sept. 6, 1963

3 Sheets-Sheet 1



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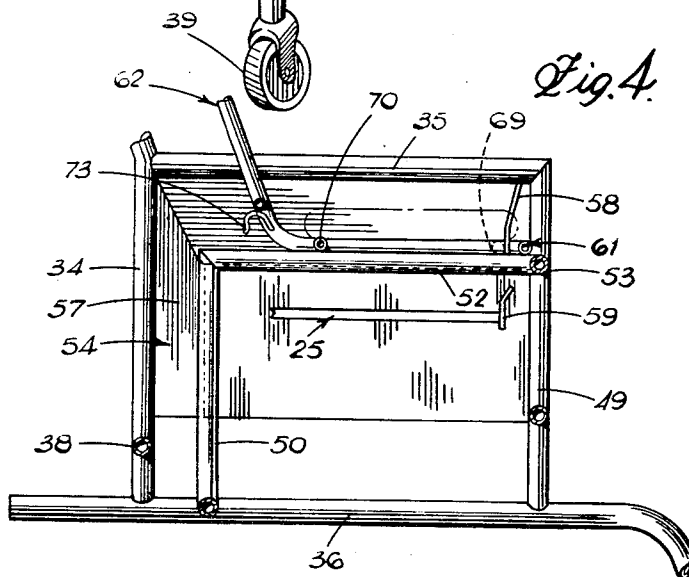
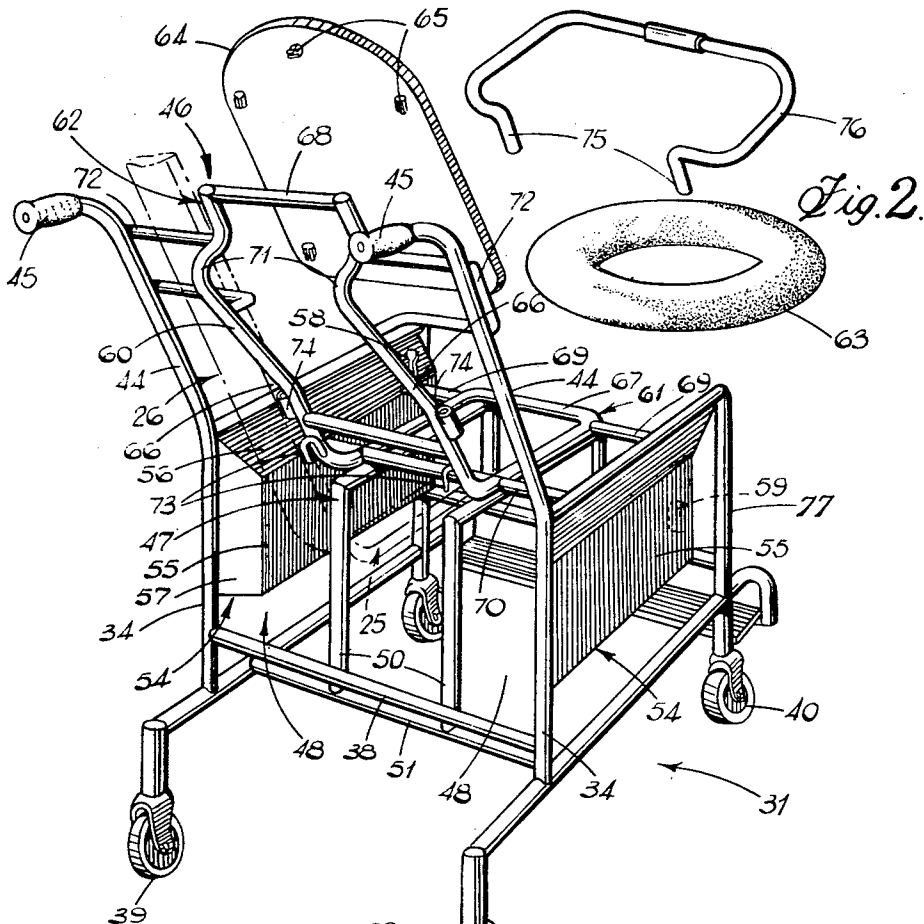
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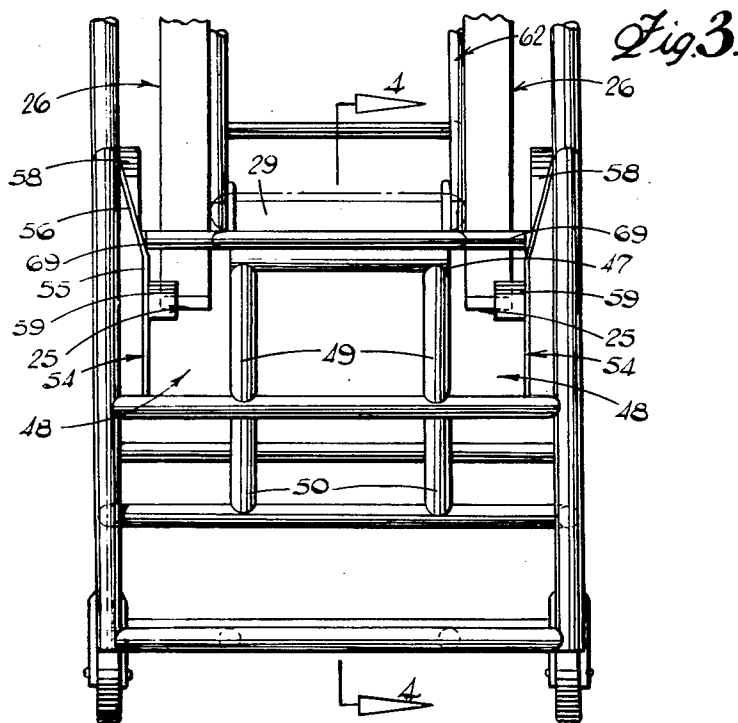
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APPARATUS FOR TRANSFERRING INVALIDS
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6 Claims. (Cl. 214—38)

This invention relates to apparatus for transferring invalids from place to place.

Essentially the present invention relates to wheeled chairs by which invalids can be transferred from place to place, such as from a bed to an invalid lifting apparatus as described in co-pending application No. 307,192 and by which an invalid can be transferred from a wheeled chair to a bath.

It is an object of one aspect of the present invention to provide an improved wheeled chair which facilitates the movement of an invalid from and to the wheeled chair.

Other objects of the invention will be readily apparent from the specification and accompanying drawings.

The invention will now be described with reference to the accompanying drawings in which:

FIGURE 1 is a front perspective view of a wheeled chair in association with an invalid lifting apparatus,

FIGURE 2 is a rear perspective view on a slightly larger scale of the wheeled chair in a partly exploded condition for the purpose of clarity,

FIGURE 3 is a fragmentary front elevation of the wheeled chair, and

FIGURE 4 is a fragmentary vertical sectional view of the wheeled chair taken on the lines 4—4 of FIGURE 3.

The invalid lifting apparatus 20 comprises a vertically disposed post 21 in which is housed a vertically disposed hydraulically operated jack (not shown) adapted to be operated by a manually oscillatable handle 22 so as to cause extension of the jack contraction of which can be controlled by valve means (not shown). Mounted on the post 21 is a lift 23 which comprises a fork lift arrangement in the form of two arms 24 which are spaced apart in side-by-side relation and in side elevation are of angle formation to afford a lower horizontal two-pronged fork lift portion 25 only one prong of which is shown in FIGURE 1 and a back portion 26 rising from the fork lift portion 25 and secured at its upper end to a sleeve 27 mounted on the post 21 in a slidable and rotatable manner and the sleeve is associated with the jack so that the lift 23 is capable of being lifted and lowered vertically and moved sideways horizontally in an angular manner about the vertical axis of the post 21.

The horizontal fork lift portion 25 and the back portion 26 are conveniently disposed so as to define an obtuse angle of approximately 110° and the two arms 24 are connected together by upper and lower horizontal cross-bars 28 and 29 disposed adjacent the upper and lower ends of the back portion 26 of the lift. Thus the arms 24 of the lift are supported at their upper ends by the sleeve 27 and the horizontal fork lift portion 25 comprises two horizontally extending arms which are only connected together adjacent their rear ends by the cross-bar 29 at approximately the junction of the horizontal fork lift portion 25 and the back portion 26.

The invalid lifting apparatus 20 is disposed adjacent one end of a bath 30 so that the lift 23 can be lowered and raised into and out of the bath and can be swung from this position through an angle of 90° about the axis of the post 21 into a position as shown in FIGURE 1 in which the lift 23 is not disposed over the bath and

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the horizontal fork lift portion 25 is disposed at an angle of approximately 90° to a longitudinal axis of the bath 30.

Such an invalid lifting apparatus is substantially as described in co-pending application No. 307,192.

For use in conjunction with the invalid lifting apparatus is a wheeled chair 31 which is composed of two main parts of which one is a chair frame 32 which is capable of being wheeled from place-to-place and the other is a removable seat 33 which is adapted to be placed on the chair frame 32 and removed therefrom by the lift 23 of the invalid lifting apparatus.

The chair frame 32 is generally of tubular construction as shown and comprises four vertical corner bars which are disposed at the corners of a rectangle, as viewed in plan, there being two front vertical corner bars 77 and two rear vertical bars 34 and the two vertical corner bars at the two opposite sides of the chair frame are connected together by upper and lower horizontal side rails 35 and 36 respectively and the two front vertical corner bars 33 are connected together by a front upper horizontal cross-bar 37 disposed between the upper and lower ends of the vertical corner bars and the two rear vertical corner bars 34 are connected together by a rear horizontal crossbar 38 disposed intermediate the upper and lower ends of said vertical corner bars.

The two lower horizontal side rails 36 are each extended beyond the rear vertical corner bars and mounted at the rear ends of said side rails are castor wheels 39 capable of swivelling about vertical axes in the normal manner.

Mounted at the lower ends of the two front vertical corner bars 77 and below the lower horizontal side rail 36 are wheels 40 which are not capable of swivelling about vertical axes and are mounted on transverse axles supported in fixed forks. Thus, the chair frame 32 is mounted on four wheels of which the rear two wheels are castor wheels enabling the chair frame to be manoeuvred as required and conveniently one or more of the wheels are associated with pedal or manually operated brake mechanism (not shown) to enable the wheeled chair to be retained in any desired position.

The two lower horizontal side rails 36 are extended at their forward ends beyond the two front vertical corner bars 77 and are turned downwardly at their forward ends at 41 to a position approximately level with the axles of the wheels and the two forward ends of the extensions are connected together by a front lower horizontal cross-bar 42 and mounted on said cross-bar is a horizontally disposed foot-rest plate 43 on which an invalid in the wheeled chair can rest his feet.

Extending upwardly from the upper end of each of the two rear vertical corner bars 34 is a handle member 44 which is inclined upwardly and rearwardly so as to define an obtuse angle of approximately 110° with respect to the upper horizontal side rails 35 and at the upper end of each handle member there is provided a handle proper 45 which is conveniently horizontally disposed and directed rearwardly. The two handle members form a back of the chair frame 32 and said members are not connected together at any position between their upper and lower ends and thus the back of the chair frame is formed with an opening 46 which is also open at the top thereof. The handles proper are provided to enable an attendant to push the wheeled chair along the floor on its wheels and enable the wheeled chair to be manoeuvred as required.

Disposed between the upper ends of the vertical corner bars is a seat supporting means 47 or central support structure which extends for almost the full distance between

the front and rear vertical corner bars and in width said structure is approximately half the width of the chair frame and is positioned centrally thereof relative to a central horizontal axis extending from front to rear of the wheeled chair, so that two fork-lift portion reception openings or channels 48 are provided which extend from front to back of the chair frame and one is disposed adjacent one side of the chair frame and the other is disposed adjacent the other side of the chair frame.

The central support structure 47 is formed by a pair of front vertical bars 49 supported at their lower ends by the front upper horizontal cross-bar 37, a pair of rear vertical bars 50 supported at their lower ends by a rear horizontal cross-bar 51 secured to the lower side rails 36, a pair of horizontal side support rails 52 extending respectively between the front and rear vertical bars at opposite sides of the axis extending from front to back of the chair and a horizontal bar 53 which extends between the upper ends of the two front vertical bars. The two horizontal side support rails 52 and the horizontal bar 53 of the central support structure thus define a horizontal platform which is disposed slightly below a plane containing the two upper horizontal side rails 35.

Disposed at each of the two sides of the chair frame is a centralising or positioning guide plate 54 and each guide plate extends for the full distance between the front and the rear vertical corner bars. Each guide plate comprises a main vertical portion 55 and an upper inclined lead portion 56 and a rear inclined lead portion 57 and the main vertical portion is spaced inwardly from its respective front and rear vertical corner bars 77, 34 and the upper inclined lead portion 56 inclines outwardly and is secured at its upper edge to the respective upper horizontal side rail 35. The rear inclined lead portion 57 also extends outwardly from the main vertical portion 55 and said rear inclined lead portion is secured at its rear end to the respective rear vertical corner bar 34. The front lower corner of the main vertical portion is secured to the front upper horizontal cross-bar 37 and thus each guide plate is supported by the front and rear vertical corner-bars 77, 34 and by the upper horizontal side rail 35.

Secured to each upper inclined lead portion 56 and extending inwardly therefrom is a lug 58 disposed adjacent the forward end of said portion and the lug includes an upper part which is inclined upwardly and forwardly to operate as a lead means hereinafter referred to.

Extending inwardly from the front vertical edge of the main vertical portion 55 of a guide plate is a stop lug 59 which extends approximately half-way or slightly less across the respective reception opening or channel 48 at the side of the chair frame and the two stop lugs are for a purpose hereinafter to be more particularly described.

The removable seat 33 comprises a tubular boundary frame 60 which is of continuous formation so as to be somewhat rectangular and affords a horizontal seat portion 61 and a back-rest portion 62 upstanding from the seat portion and these two portions, together define an obtuse angle of approximately 110° when the removable seat is viewed in side elevation. The seat portion is arranged to support a seat pad ring 63 and the back-rest portion is arranged to support a back-rest pad 64 and said pads are secured to the boundary frame in any convenient manner such as clips 65 as shown in the pad 64 only.

The boundary frame 60 of the removable seat thus comprises two side members 66 which are connected together at the front of the seat portion by a horizontal transverse member 67 and are connected together at the upper end of the back-rest portion by a transverse member 68. Secured to the side members 66 of the seat portion of the boundary frame are front and rear transverse bars. Two front stub bars 69 are provided which extend outwardly horizontally, one from each side member and

the two stub bars are co-axial and are adapted to co-operate with the lead means or lugs 58 and a single rear transverse bar 70 is provided which extends for the full distance across the side bars and slightly beyond said side bars to the same extent as the stub bars 69 and the width apart of the outer ends of the stub bars 69 and the transverse bar 70 is approximately equal to the width apart of the two vertical portions 55 of the two guide plates 54.

The side members 66 of the back-rest portion of the boundary frame are formed with rearward bends 71 which form positioning means adapted to engage the inner side faces of the two arms 24 of the back-rest portion of the fork-lift arrangement to prevent sideways movement of the movable seat relative to the fork-lift arrangement.

Secured to the side members 66 are outwardly extending loops 72 which bear against the front of the handle member 44 to prevent rearward movement of the removable seat relative to the fork-lift arrangement.

Secured to each side member 66 of the back-rest portion of the frame of the removable seat is an inverted hook 73 which is disposed adjacent the junction of the seat portion and the back-rest portion and the two hooks are adapted to engage over the lower horizontal cross-bar 29 which connects together the two arms 24 of the lift at a position slightly above the rear of the fork-lift 25 of said lift. The hooks 73 and cross-bar 29 form positioning means which are interengaged and disengaged simply by downward and upward movements respectively of the removable seat relative to the lift.

The side members 66 of the frame of the removable seat are also provided with upright sockets 74 which form holding means to be engaged in a disengageable manner by spigot ends 75 of a retaining bar 76 which is of generally bowed formation and includes side portions and a front portion adapted to extend across the front of the removable seat and an invalid thereon to retain the invalid on the removable seat.

If desired the removable seat may also incorporate a suitable leg-rest 43 for the invalid seated on the removable seat.

When the removable seat 33 is resting on the chair frame 32 the seat portion 61 of the removable seat rests on the central support structure 47 such that the horizontal transverse member 67 at the front of the seat portion and the rear transverse bar 70 rest on and across the horizontal side support rails 52 of the structure and the front transverse stub bars 69 lie against the back faces of the lugs 58 to prevent forward movement of the removable seat relative to the chair frame and the loops 72 on the side members of the frame of the removable seat also rest against the front faces of the handle members 44 to prevent rearward movement of the removable seat relative to the chair frame.

Sideways movement of the removable seat 33 relative to the chair frame 32 is prevented by the ends of the stub bars 69 and the bar 70 bearing against the portions 55 of the guide plates 54 and by the bends 71 engaging the arms 24 of the lift.

In order to remove the removable seat 33 from the chair frame 32 by means of the lift 23 of the invalid lifting apparatus the wheeled chair 31 is wheeled backwardly by an attendant so that the fork-lift portion 25, in its lowered position, passes through the opening 46 in the back of the chair frame between the handle members 44 thereof and the two arms of the horizontal fork-lift portion enter the two reception openings or channels 48 on the two sides of the central support structure 47 and rearward movement of the wheeled chair is continued until the two stop lugs 59 at the front of the two guide plates 54 abut against the front ends of the two arms of the fork-lift portion and in this position said fork-lift portion is disposed beneath the front transverse stub bars

69 and beneath the two ends of the rear transverse bar 70 and which ends project beyond the side members 66 of the boundary frame of the removable seat. During the initial entry of the fork-lift portion 25 into the two reception openings 48 said portion is centralised relative to the chair frame by the two rear inclined lead portions 57.

By causing the lift 23 of the invalid lifting apparatus to be raised the fork-lift portion 25 engages below the front and rear transverse bars 69, 70 of the removable seat and lifts said removable seat out of the chair frame and during this movement the lower horizontal cross-bar 29 connecting the side members of the lift together engages within the two hooks 73 secured to the back-rest portion of the boundary frame of the removable seat, and the positioning means 71 on the said back-rest portion lie against the arms of the lift so that the removable seat is securely supported by the lift and there is no danger of the removable seat being accidentally separated from the lift.

When the removable seat 33 has been lifted to the required height clear of the chair frame 32 the lift 23 and the removable seat with the invalid thereon is swung angularly sideways about the vertical axis of the post 20 so that the removable seat and the invalid thereon is transferred from one position above the chair frame to another position over the bath 30 in which the patient is to be treated and the lift and thus the removable seat with the invalid thereon can then be lowered so that the patient can be partially immersed in the bath. In order to return the invalid to the chair frame after treatment, the lift is raised and swung back from the position over the bath to the position over the chair frame and the lift and thus the removable seat and invalid are then lowered.

During the lowering motion, one of the two arms 24 of the fork-lift portion 25 of the lift may bear against the upper inclined lead portion 56 of one of the guide plates, so that said guide plate moves the fork-lift portion and thus the removable seat into a position central relative to a central axis extending from front to back of the chair frame and the chair frame is positioned so that the front ends of the two arms of the fork-lift portion are disposed closely adjacent the rear faces of the two stop lugs 59. Just prior to the seat portion of the removable seat coming into contact and resting on the central support structure 47 the front transverse stub bars 69 on the frame of the removable seat bear against the rear inclined faces of the two lugs 58 and the removable seat comes to rest on the central support structure 47 with the transverse stub bars 69 disposed against the rear of the lugs 58 which thus form location means, preventing accidental forward movement of the removable seat on the chair frame.

Continued downward movement of the lift causes the two arms 24 of the fork-lift portion 25 to move out of contact with the front and rear transverse bars 69, 70 of the seat portion of the removable seat and causes the lower horizontal cross-bar 29 of the lift to become disengaged from the hooks 73 on the frame of the removable seat so that the wheeled chair with the invalid thereon can then be pushed forwardly so as to be withdrawn from the lift.

The invention thus provides a wheeled chair comprising a chair frame and a removable seat on which an invalid can be supported and which removable seat, together with the invalid thereon, can be easily removed from the chair frame by powered operated lift means, so that the invalid can receive treatment, after which the removable seat and the invalid can be returned to the chair frame so that the invalid is properly supported in the wheeled chair and the invalid can then be transferred to another place as required.

What we claim then is:

1. A wheeled chair comprising a chair frame of sub-

stantially rectangular formation in plan view and having vertical legs at the four corners and wheels adjacent the lower ends of the corners, two handle members extending upwardly at the two rear corners of the chair frame and not connected together so that an opening is defined at the back of the wheeled chair and which is open at its upper end, a seat supporting structure of elongated rectangular formation in plan view and narrower than the chair frame and extending in a front to back direction thereof and centrally disposed relative to the chair frame to define in conjunction with the two sides of the chair frame two open topped reception openings or channels which extend in a front to back direction of the chair frame and communicate at their rear ends with the said opening, a removable seat adapted to be placed on the seat supporting structure and having a frame which affords a horizontal seat portion to support a seat pad and a backrest portion upstanding from the back of the seat portion to support a backrest pad and the frame of the horizontal seat portion having positioning means thereon and said horizontal seat portion being sufficiently wide to overlie the two reception openings or channels, guide plates secured to the two sides of the chair frame to form positioning means co-operative with the positioning means of the horizontal seat portion to prevent sideways movement of the horizontal seat portion of the removable seat relative to the chair frame, positioning means secured to the guide plates to co-operate with the positioning means of the horizontal seat portion to prevent forward movement of the removable seat relative to the chair frame, inclined lead means associated with the guide plates to correctly position the removable seat during lowering movement thereof in both sideways and front to back directions and to correctly position a fork-lift capable of being inserted downwardly and forwardly into the two reception openings or channels so as to be disposed below the overlying side portions of the removable seat when on the central supporting structure, stop means on the chair frame at the forward ends of the reception openings or channels to co-operate with the forward end of the fork-lift and determine the forward movement thereof in the reception openings or channels, positioning means on the backrest portion of the removable seat to rest on the front of the two handle members to prevent rearward movement of the removable seat relative to the chair frame and to bear against inside faces of the lift to prevent sideways movement of the backrest portion of the removable seat relative to the lift, socket holding means on the backrest portion of the removable seat at opposite sides thereof and a retaining bar of generally bowed formation and formed with spigot ends to removably engage the socket holding means to enable the retaining bar to be supported across the front of an invalid in the removable seat, the arrangement enabling the lift with the removable seat supported thereon to be lifted and lowered out of and into the opening through the open top thereof, at the rear of the wheeled chair.

2. A wheeled chair comprising a chair frame mounted on wheels, said chair frame including seat supporting means and a handle arrangement for manually propelling the chair, a removable seat comprising a frame which affords a horizontal seat portion and a back rest portion, which frame can be placed on said seat supporting means so as to be supported thereby, holding means at each side of the frame of said removable seat and a retaining bar for engagement with said holding means, which bar is adapted to extend across the front of the removable seat to retain an invalid disposed on said removable seat in position, the handle arrangement including a pair of horizontally spaced apart hand grips and a pair of upright members which are interconnected by bracing means extending between the lower ends of said upright members, said bracing means being disposed below the level of said supporting means to define, together with said upright members, an opening through

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which lifting means can be inserted for engagement with the underside of said removable seat to enable the removable seat and an invalid disposed thereon to be raised from said frame.

3. A wheeled chair according to claim 2 in which the seat supporting means is constituted by a central supporting structure the width of which is less than the width of the chair frame so that two reception channels are provided, one on either side of said central supporting structure, the channels extending in a back to front direction of the chair frame to receive the arms of a fork lift, the removable seat being wider than said central supporting structure so that side portions of said removable seat overlie the two reception channels.

4. The combination of a wheeled chair according to claim 2 and a fork lift, the fork lift and the removable seat of said wheeled chair each being provided with positioning means to prevent relative sideways and forward and backward movement of the removable seat and lift, the positioning means of the fork lift including a cross bar and the positioning means of the removable seat including a pair of inverted hook formations whereby said cross bar and hook formations can be interengaged or disengaged by upward or downward movement respectively of the lift relative to the removable seat.

5. A wheeled chair according to claim 2 in which the retaining bar is of generally bowed formation and includes a front portion, a pair of side portions and end

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portions which engage said holding means so that the retaining bar serves to prevent both forward and side-wards movement of an invalid placed on said removable seat.

6. A wheeled chair according to claim 5 in which the holding means of the removable seat comprises a pair of upright sockets and the end portions of said retaining bar comprise a pair of spigots which are downwardly directed relative to the front and side portions of said retaining bar.

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