

Nov. 2, 1965

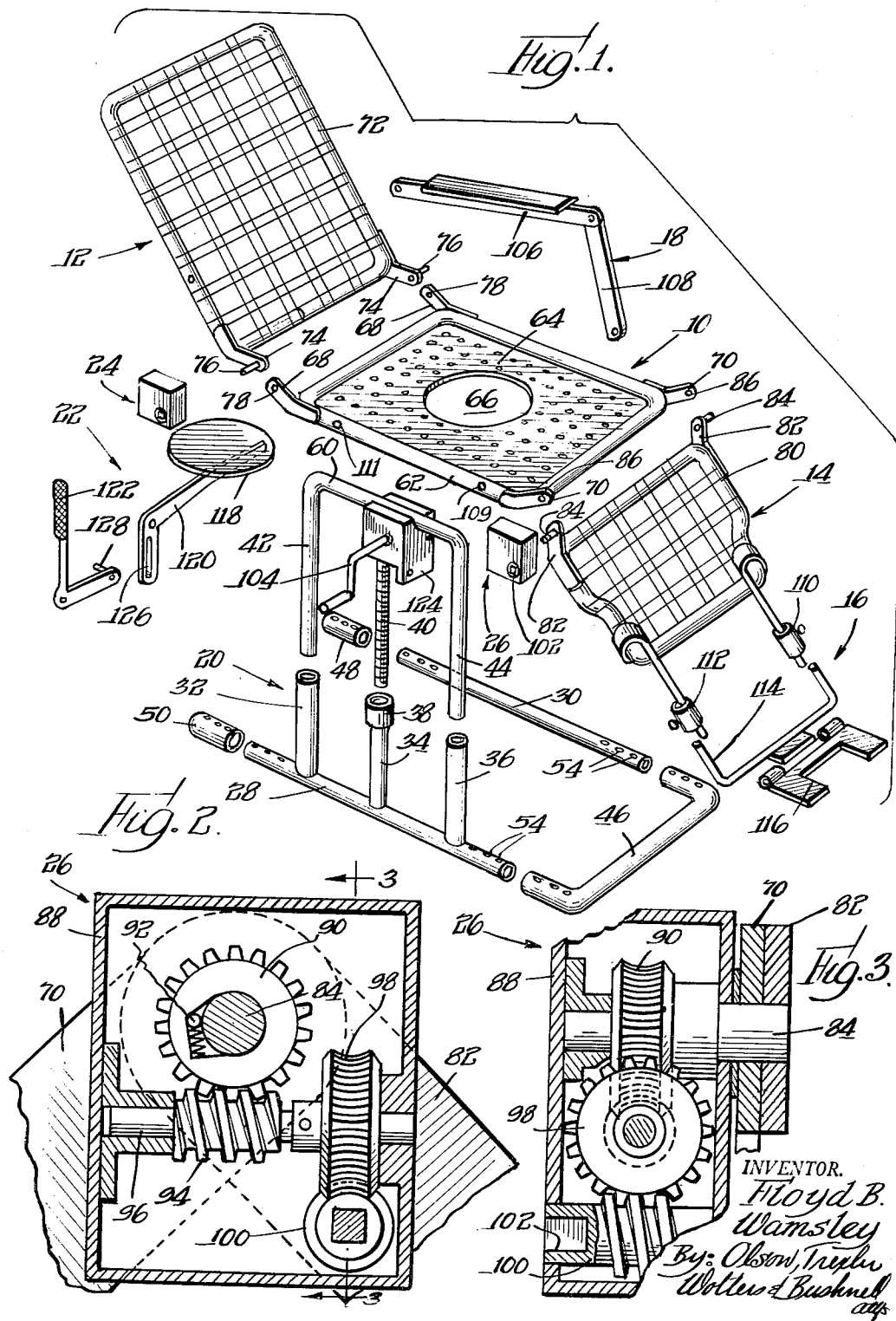
F. B. WAMSLEY

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Filed March 5, 1962

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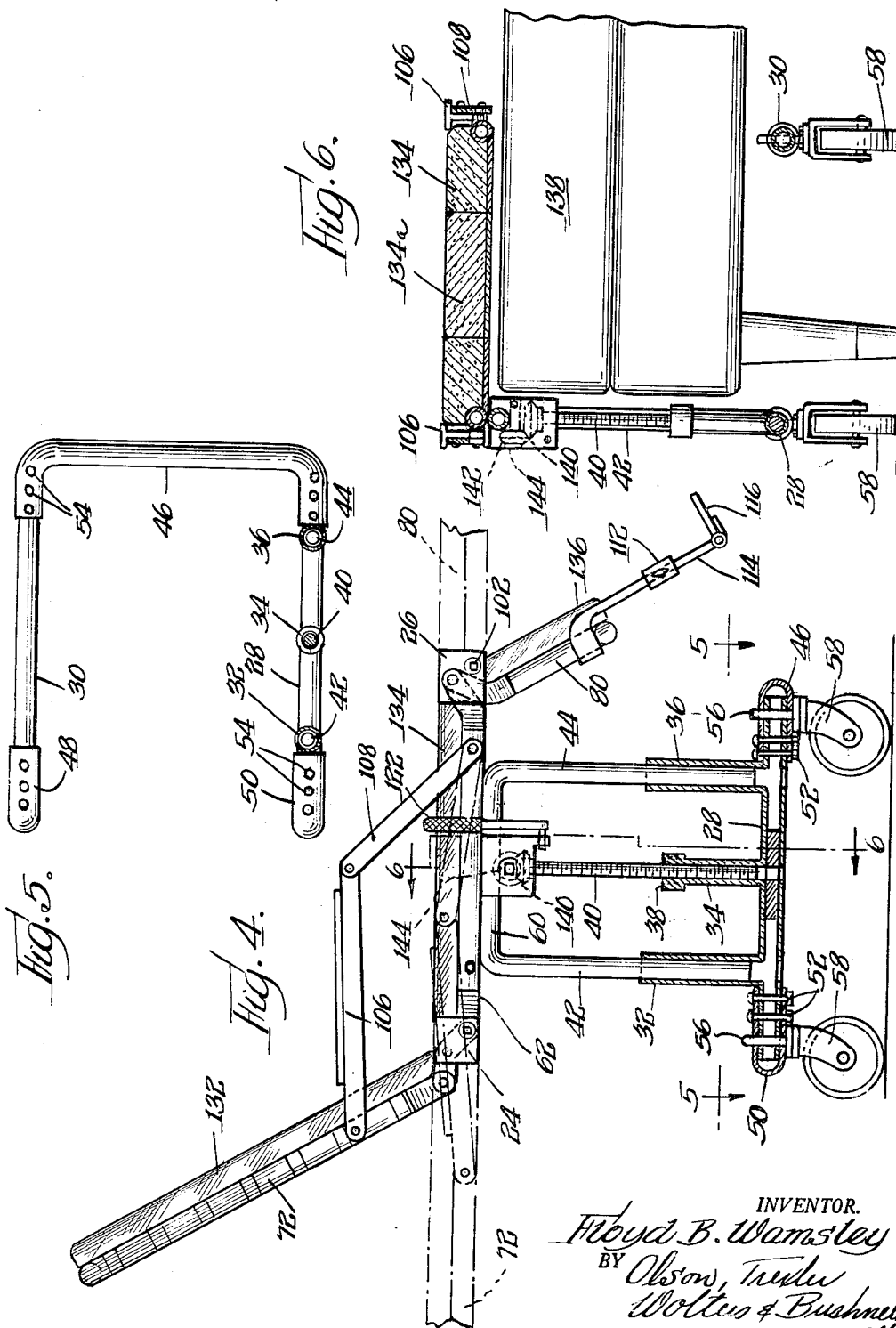
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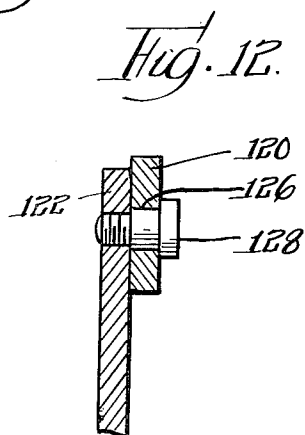
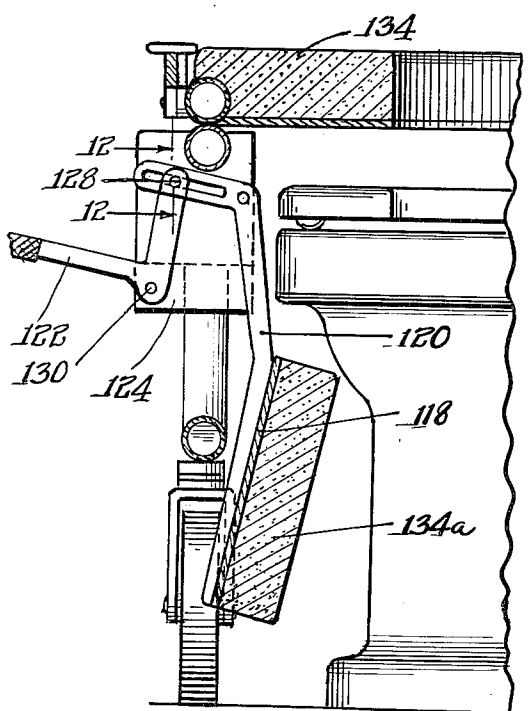
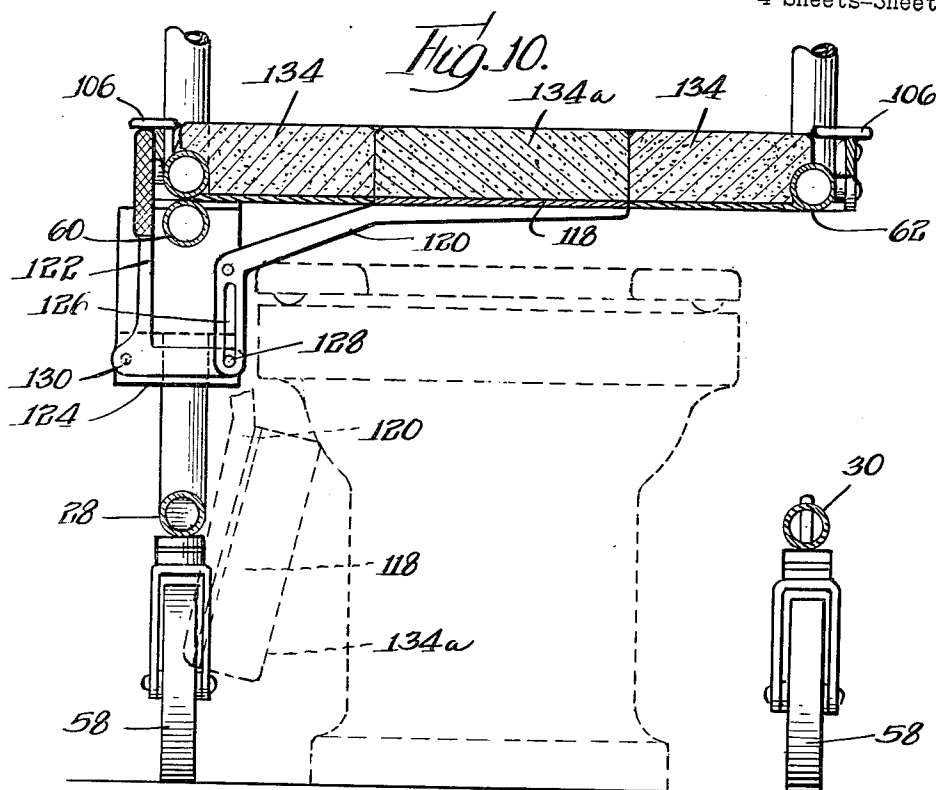
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4 Sheets-Sheet 4



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INVALID CHAIR

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6 Claims. (Cl. 297-348)

This invention relates to invalid chairs, and concerns particularly a wheel chair which may be used in association with a bed and with a toilet in a novel and improved manner. The chair is of the general type shown in my prior Patent No. 2,869,614, dated January 20, 1959.

It is an object of the present invention to provide a wheel chair of the foregoing type which is more compact, so that it may be more readily manipulated within the interior of dwellings or hospitals, while at the same time having the necessary range of operation so that it may be readily used in association with a bed and with a toilet in the intended manner.

A further object of the invention is to provide a wheel chair of the foregoing type which is of simplified structure, so that it may be more readily fabricated at low cost to facilitate its range of use, and assembled if necessary by the user with ease and facility.

A still further object of the invention is to provide a wheel chair of the foregoing type which is universal in character so that it may be assembled in various manners for cooperative use with different bed arrangements.

Various other objects, advantages and features of the invention will be apparent from the accompanying drawings wherein a preferred embodiment of the invention is set forth for purposes of illustration.

In the drawings wherein like reference numerals refer to like parts throughout:

FIG. 1 is an exploded view showing the various parts of the wheel chair constructed in accordance with the invention in one preferred embodiment thereof;

FIG. 2 is an enlarged detail view of one of the control mechanisms used in the structure of FIG. 1;

FIG. 3 is a sectional view of the mechanism of FIG. 2 taken on the line 3-3 thereof;

FIG. 4 is a side view of the structure illustrating the parts in sitting position;

FIG. 5 is a detail view of the lower frame assembly taken as indicated by the line 5-5 of FIG. 4;

FIG. 6 is a sectional illustrative view taken as indicated by the line 6-6 of FIG. 4, certain parts being omitted for clarity, and the structure being shown in association with a bed;

FIG. 7 is a side illustrative view showing the structure in association with a toilet;

FIG. 8 is a view similar to FIG. 7, illustrating the structure from the front, certain parts being omitted for clarity;

FIG. 9 is a top view of the seat structure;

FIG. 10 is an enlarged detail view more particularly showing the seat structure in association with a toilet, and illustrating the seat operating mechanism;

FIG. 11 is a detail view showing the seat operating mechanism of FIG. 10 in a different position; and

FIG. 12 is a detail view of a part of the operating mechanism of FIG. 11 taken as indicated by the line 12-12 thereof.

Referring more particularly to the drawings, and first to the exploded view in FIG. 1, it will be seen that the chair structure comprises a seat generally indicated by the foot rest structure 16, an arm structure 18, of which one is illustrated in FIG. 1, a chair frame support structure reference numeral 10, a back rest 12, a leg rest 14, a 20, and a seat and a seat operating mechanism generally indicated by the reference numeral 22. Two control

2

mechanisms respectively for the back and leg rest are indicated at 24, 26.

Referring particularly to FIGS. 1, 4 and 5, it will be seen that the lower frame structure more specifically comprises a pair of longitudinal frame members 28 and 30, tubular in form, member 28 having welded thereto three upright tubular members as indicated at 32, 34 and 36. Tube member 34 carries a nut 38 at its upper end. Nut 38 is adapted to threadedly receive a screw shaft 40 formed as a part of the upper frame assembly arranged to be welded to the chair seat 10, and the upper frame assembly further comprises two tubular members 42 and 44 adapted to be telescopically received by the tubes 32 and 36 respectively. As best shown in FIG. 4, members 40, 42 and 44 may be projected downwardly through the longitudinal frame tube 28, into the position shown for example in FIG. 7. By reason of the foregoing arrangement, the telescoping parts have a maximum range of movement in respect to their length.

The lower frame structure further comprises a tubular frame piece of general U-shape, indicated by the reference numeral 46, FIG. 1, and a pair of tubular end caps as indicated at 48 and 50.

It will be seen that by suitably arranging the members 46, 48 and 50, at either end of the longitudinal frame members 28 and 30, and by positioning the back and leg rests 12 and 14 at the desired ends of the seat 10, the chair structure may be adapted for use with different bed arrangements within a room, as will presently appear.

As best shown in FIG. 4, the lower frame assembly may be held together by removable bolts 52 received within the frame holes 54.

The holes 54 also provide support for pins 56, FIG. 4, by means of which the frame structure may be supported by suitable wheel casters as indicated at 58, which wheel casters may be of any suitable standard construction.

As best shown in FIG. 4, cross tubular member 60 which interconnects the depending leg tubes 42 and 44 is arranged to be welded or otherwise secured to tubular member 62 forming one of the longitudinal tubular frame parts of the generally rectangular seat frame structure 10. The seat further comprises a central sheet metal portion or member 64 having a central opening 66, and four extending arms arranged in pairs as indicated respectively at 68 and 70, FIG. 1.

The back rest 12 comprises a tubular rectangular frame 72 provided at one end with a pair of extending arms 74, FIG. 1, carrying pivot pins 76 arranged to be received within openings 78 in the seat arms 68.

Similarly the leg rest 14 comprises a tubular frame 80 having a pair of arms 82 projecting at one end thereof carrying pins 84 adapted to be received within opening 86 in the seat arms 70.

To control the movements of the back rest and leg rest relative to the seat, control mechanisms as indicated at 24 and 26 are provided, the control mechanism 26 being shown in detail in FIGS. 2 and 3. Both control mechanisms are of generally similar structure and only one need be specifically described.

Referring to FIGS. 2 and 3, it will be seen that control mechanism 26 comprises a frame or housing 88 arranged to be welded or otherwise secured to the arm 70 of the seat frame 62. Pin 84 is journaled within a worm gear 90, a one way ball clutch being provided therebetween as indicated at 92, FIG. 2. By this arrangement it will be seen that the pin 84 may be freely rotated counterclockwise in respect to the worm gear 90 so that the leg rest 14 may be correspondingly freely moved counterclockwise or lifted upwardly, but the leg rest and pin cannot be lowered or moved clockwise unless the worm gear 90 is correspondingly rotated.

Worm gear 90 is in geared engagement with a worm 94 secured to a shaft 96, which shaft also carries a worm gear 98 arranged for operation by a worm 100 provided with a crank receiving socket as indicated at 102.

It will be seen that when the crank 104, FIG. 1, is manipulated within the socket 102 the leg rest 14 may be lowered as desired. However, the leg rest may be raised or moved counterclockwise merely by lifting it without operation of the crank. The worm and worm gear arrangements are so provided that the mechanism is self-locking, viz., the leg rest cannot be lowered except by suitable actuation of the crank.

Control mechanism 24 for the back rest 12 is similarly arranged to be welded or otherwise secured to the arm 68 of the seat and arranged to receive the pin 76 of the back rest for crank manipulation in a similar manner. The arrangement is such that the back rest likewise may be raised freely without manipulation of the crank, but lowered under crank control.

Each arm structure more specifically comprises a horizontally extending link or member 106, FIGS. 1 and 4, and a vertically extending link 108 pivotally connected thereto. The free end of link 106 is arranged to be pivotally connected to the back rest, whereas the free or lower end of link 108 is arranged to be pivotally connected to the seat frame, and the length of the links is such that as the back rest is raised the arm structure is automatically brought into the position shown in FIG. 4, from its lower dotted line position. Link 108 may be connected to opening 109 or opening 111 depending on whether the back rest is mounted to the left or right of the seat.

The leg rest 80 is arranged to carry a suitable extensible foot rest, previously mentioned, and generally indicated by the reference numeral 16, FIG. 1. This foot rest structure more specifically comprises a pair of clamps 110 and 112 adapted to be suitably clamped to the leg rest frame 80, these clamps carrying a cross bar 114, FIGS. 1 and 8, pivotally supporting a suitable foot rest 116.

Referring to FIGS. 1, 10, 11 and 12, it will be seen that there is provided a seat plate 118 arranged to fit within the opening 66 of the seat, in coplanar disposition to the sheet metal seat member 64, said member 118 being adapted to move from an upper position as shown in full lines in FIG. 10 to a lower position as shown in dotted lines by means of an operating mechanism which more specifically comprises a lever 120 welded or otherwise secured to the plate 118, and an operating handle lever 122. Referring to FIG. 10, it will be seen that lever 120 is pivotally mounted upon a bracket 124 carried by the upper frame member 60, said lever 120 being provided with a slot 126 arranged to receive a pin 128 carried by operating lever 122 which latter lever is also pivotally mounted upon the bracket 124 as indicated at 130, FIG. 10.

FIG. 11 shows the parts when the lever 122 has been actuated counterclockwise to lower the seat plate 118 into its dotted line position of FIG. 10. It will be seen that when the parts are in the full line position of FIG. 10, the seat plate 118 is locked in its uppermost position by a toggle positioning of the parts.

FIG. 12 more specifically shows the arrangement of the pin 128 and its manner of cooperation within the slot 126 of the lever 120. It will be seen that the pin 128 comprises a threaded fastener threaded into the lever 122 and suitably headed so as to provide adequate and free clearance movement within the slot 126.

As shown for example in FIGS. 4 and 10, foam cushion pads 132, 134 and 136 are preferably provided respectively for the back rest, seat and leg rest, and the seat plate member 118 is provided with foam cushioning 134a for cooperating arrangement with the seat pad 134.

In operation, the back rest, seat and leg rest may be manipulated into horizontal position, and the seat height

suitably adjusted vertically, so as to bring the structure over a bed mattress 138 as indicated in FIG. 6, and in dotted lines in FIG. 4. As previously stated, the leg rest and the back rest may be lifted freely, but are manipulated downwardly by crank control through the action of the control mechanisms 24 and 26 as previously described. The vertical adjustment of the seat is effected by manipulation of the crank to effect rotation of the screw 40 within the nut 38. For this purpose the upper end of the screw is provided with a bevel gear 140, FIG. 4, adapted for meshing engagement with a bevel gear 142 having a crank opening 144. Crank 104 is removable for operation of control mechanisms 24 and 26.

With the parts positioned as indicated in FIG. 6, the patient may be rolled from the bed mattress onto the chair structure, and it will be noted that at this time the arms of the chair are automatically lowered so that the chair structure forms an essentially flat surface for receiving the patient.

The chair may then be moved laterally away from the bed and the back rest and leg rest manipulated into sitting position as indicated in FIG. 4, full lines.

The manner in which the structure may be manipulated over a toilet is indicated in FIGS. 7 and 8, and prior to the positioning of the structure over the toilet the plate 118 may be lowered to dotted line position as indicated in FIG. 10. When used in association with a toilet, the seat height may be adjusted as desired and the back rest and leg rest may also be adjusted into desired vertical position as indicated for example in FIG. 7.

When the structure is manipulated to sitting position the arms are automatically raised as shown in FIG. 4.

It will be seen that the frame structure is so constituted and arranged that the structure may be pushed laterally over a bed as shown in FIG. 6 and also pushed rearwardly over a toilet bowl as seen in FIGS. 7 and 8. It is further to be noted, as previously mentioned, that by assembling the frame in the proper manner, viz., by placement of the transverse frame member 46 either to the left or to the right of the basic frame structure, and by placement of the leg rest and the back rest either to the right or to the left of the seat, the structure may be arranged for cooperation with either side of a bed as desired, whereby to facilitate the use of the chair with beds positioned differently in the furniture arrangement of a room. Thus the chair may be made for lateral cooperation with either side of a bed, which may be accessible, and whether the head end of the bed is to the right or to the left of the accessible side portion. This is an important feature as it permits a single basic chair structure to be used with any desired bed furniture arrangement.

It is obvious that various changes may be made in the structure without departing from the invention. The invention is accordingly not to be limited to the specific structure shown and described but only as indicated in the following claims.

The invention is claimed as follows:

1. A wheel chair comprising a seat, a back rest, a leg rest, and a support frame, and means for pivotally connecting the back rest and leg rest to the seat, said pivot connections including a crank operable gearing including a one way clutch mechanism.

2. A wheel chair comprising a seat, a back rest, a leg rest, and a support frame, and means for pivotally connecting the back rest and leg rest to the seat, said support frame comprising a pair of longitudinal members and a transverse member forming a "U" frame, the transverse member being attachable to either end of the longitudinal members.

3. A wheel chair comprising a seat, a back rest, a leg rest, and a support frame, and means for pivotally connecting the back rest and leg rest to the seat, said support frame comprising a pair of longitudinal members and a transverse member forming a "U" frame, the transverse member being attachable to either end of the longi-

5

tudinal members, and said support frame being connected to one side only of the seat.

4. A wheel chair comprising a seat, a leg rest, and a back rest, mounting means at opposite ends of the seat pivotally mounting the leg rest and back rest for movement from an angular chair position to a coplanar bed position, a toilet opening in the seat, a wheel frame, means interconnecting the seat and wheel frame disposed at one side only of the seat, said wheel frame being open at one end, a pair of arm rests operable between a raised position and a lowered position as the leg rest and back rest are pivotally moved, the mounting means at the opposite ends of the seat interchangeably supporting either the leg rest or the back rest, and means on opposite sides of the seat for supporting the arms for extension in either of two opposite directions as the leg rest and back rest are interchanged at the opposite ends of the seat.

5. A wheel chair comprising a seat, a leg rest, and a back rest, mounting means at opposite ends of the seat pivotally mounting the leg rest and back rest for movement from an angular chair position to a coplanar bed position, a toilet opening in the seat, a wheel frame, means interconnecting the seat and wheel frame disposed at one side only of the seat, said wheel frame being open at one end, said interconnecting means comprising a screw member and a pair of telescoping guides disposed on opposite sides of the screw member, said telescoping guides including portions movable from an upper position to a lower ground engaging position.

6. A wheel chair comprising a seat, a leg rest, and a back rest, mounting means at opposite ends of the seat pivotally mounting the leg rest and back rest for move-

6

ment from an angular chair position to a coplanar bed position, a toilet opening in the seat, a wheel frame, means interconnecting the seat and wheel frame disposed at one side only of the seat, said wheel frame being open at one end, a closure member for said toilet opening, and means for operating said closure member, said operating means comprising a pair of interconnected bell cranks one of which carries the closure member and the other of which is provided with a handle, the handle being movable toward vertical position as the closure member is move away from said toilet opening.

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