

Sept. 17, 1946.

O. MEHR
HOSPITAL BED

2,407,892

Filed May 20, 1943

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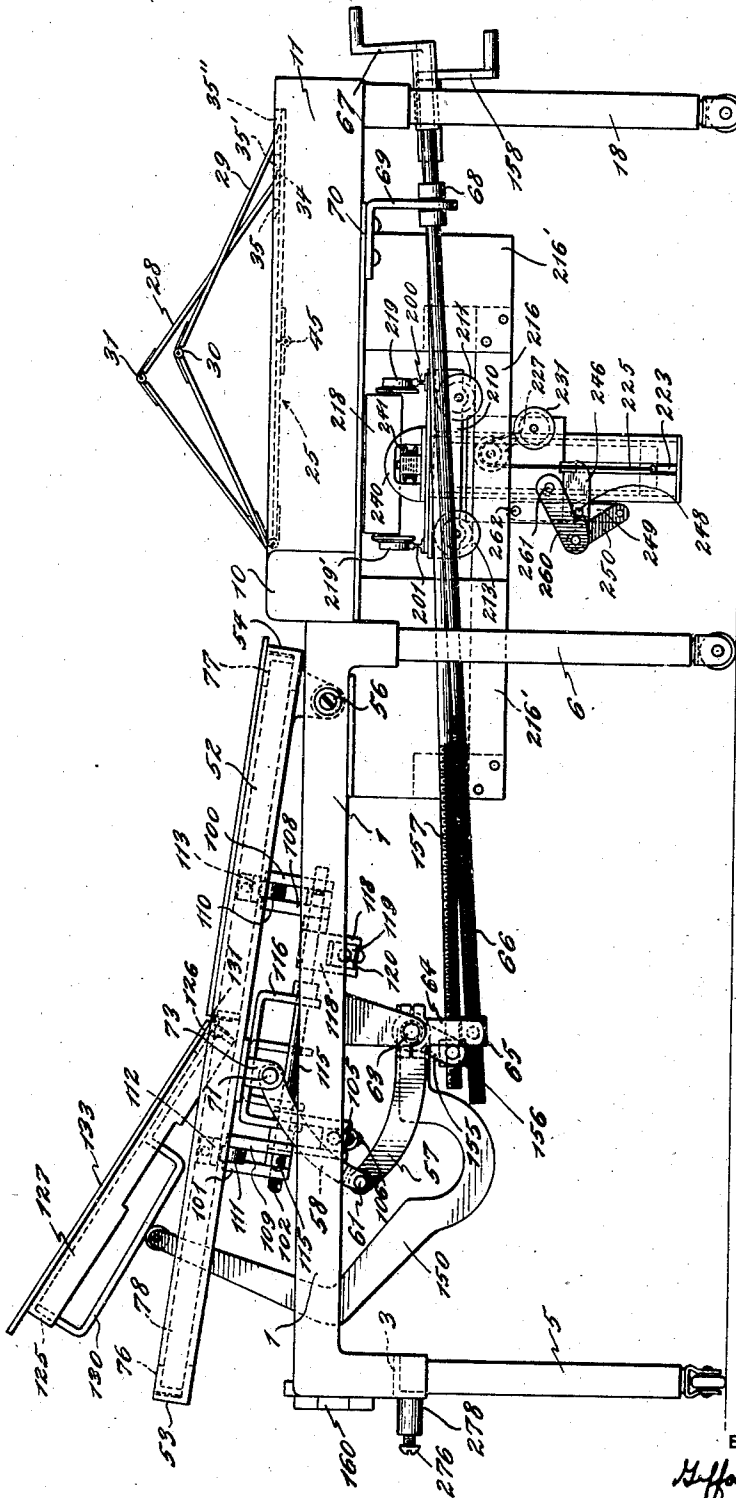


Fig. 1.

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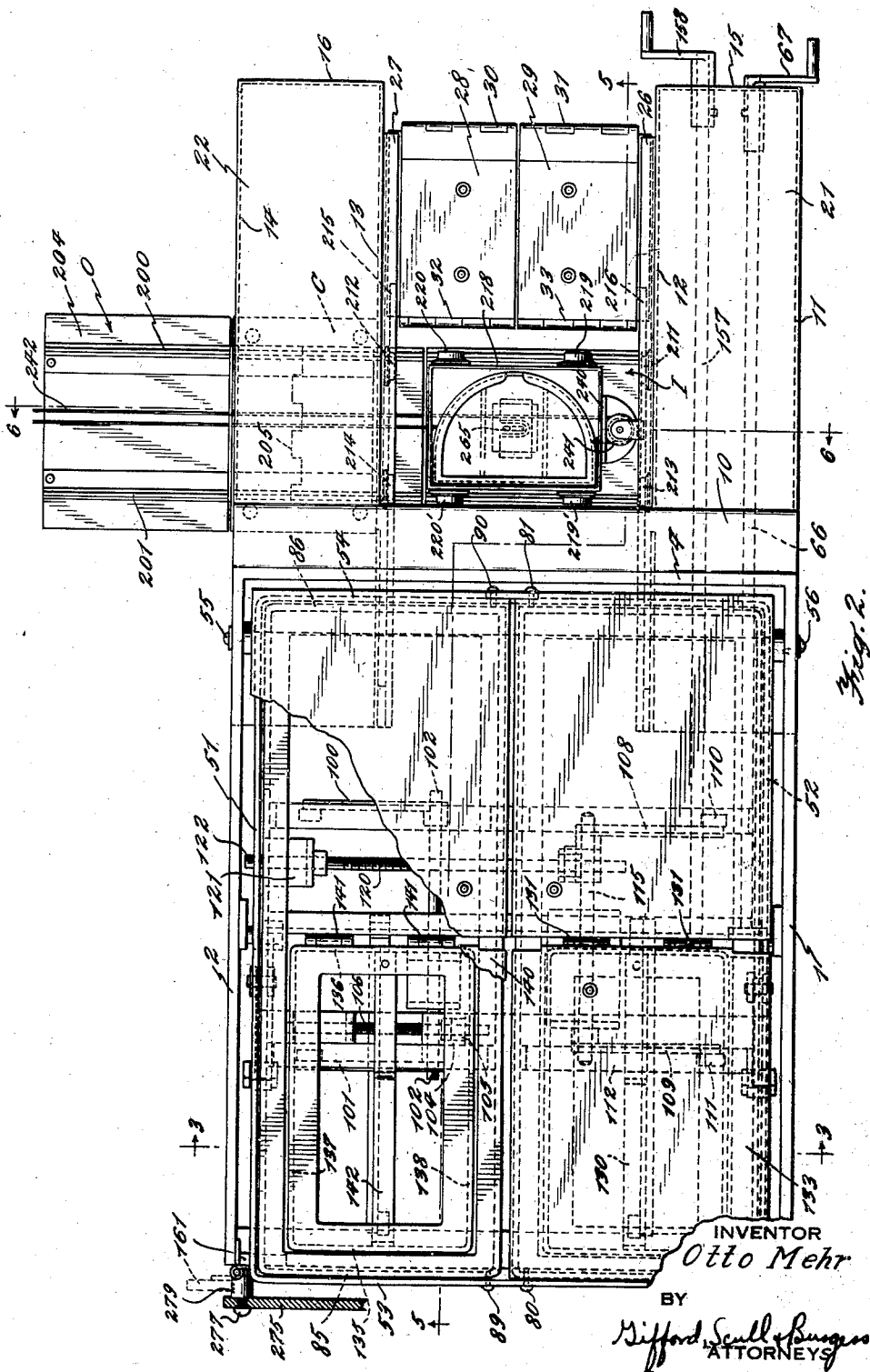
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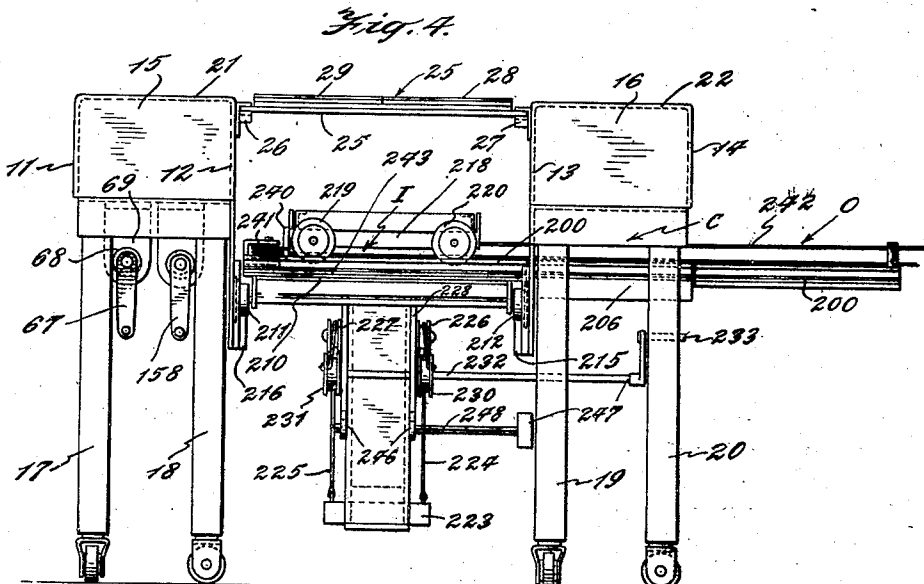
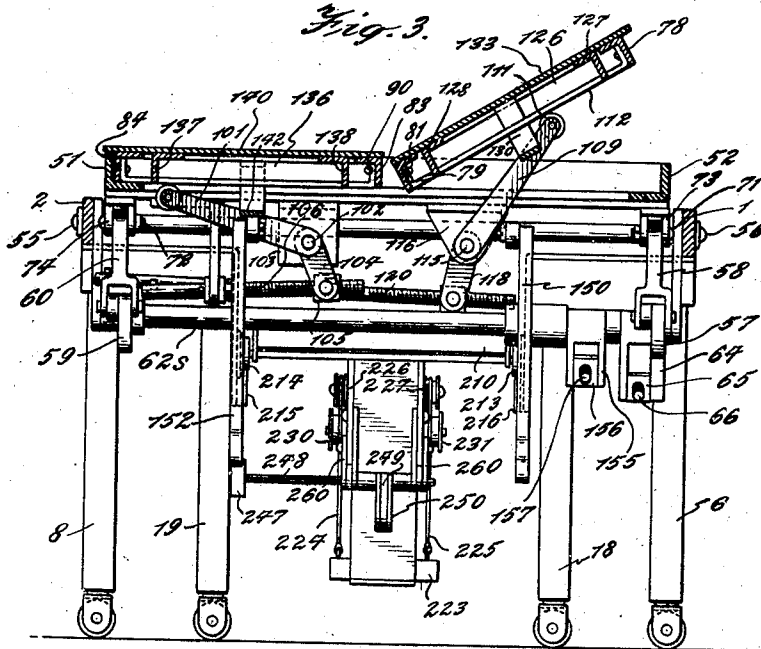
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6 Sheets-Sheet 3



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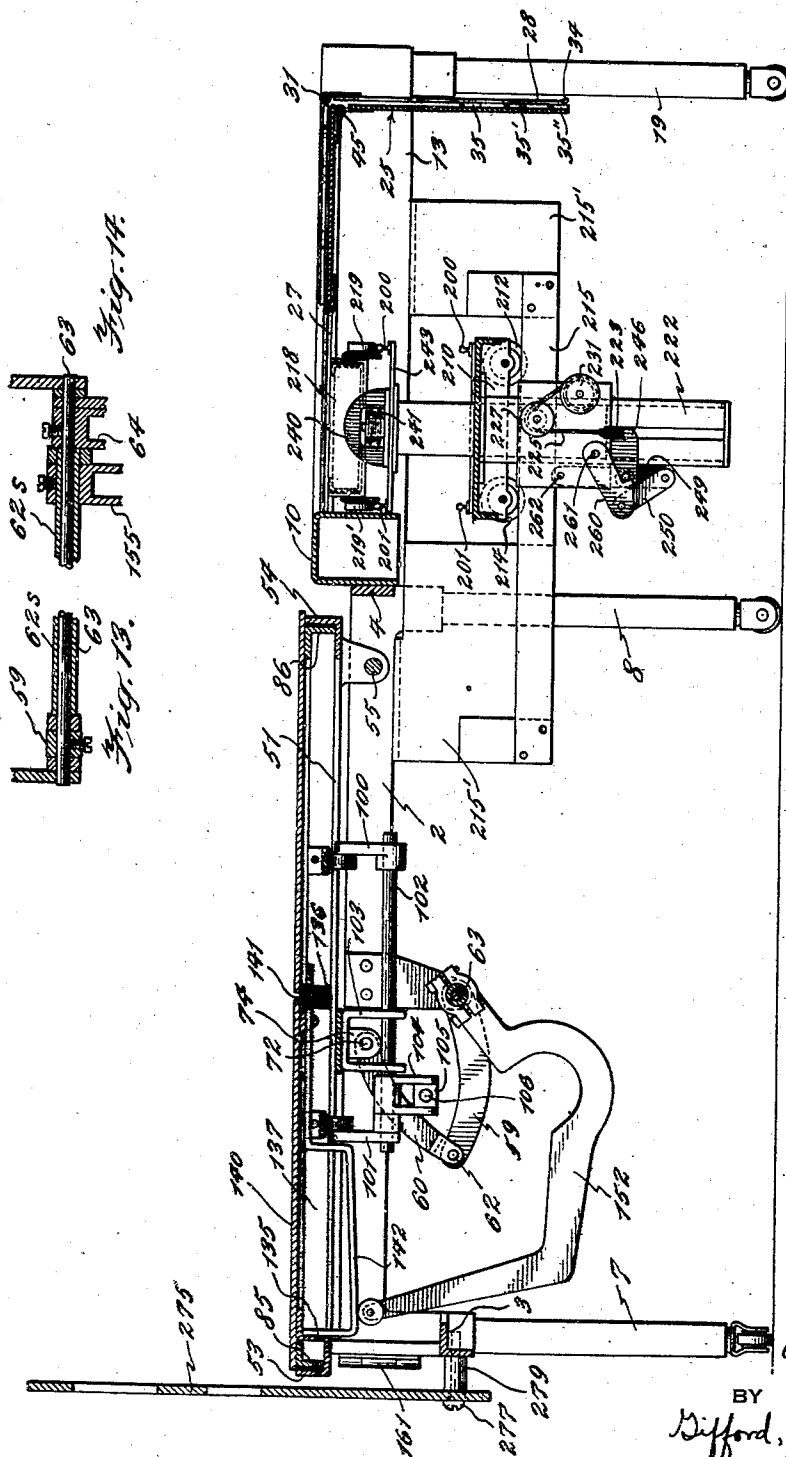


Fig. 5.

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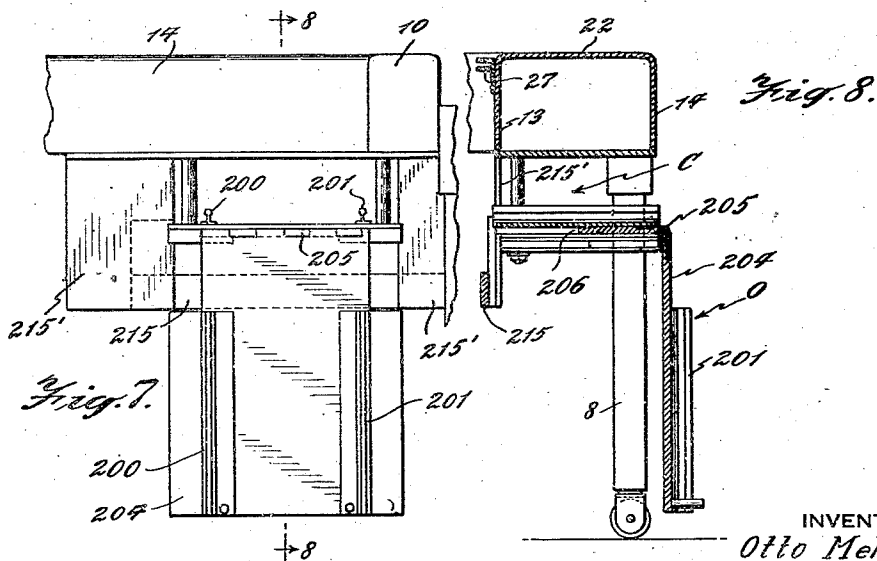
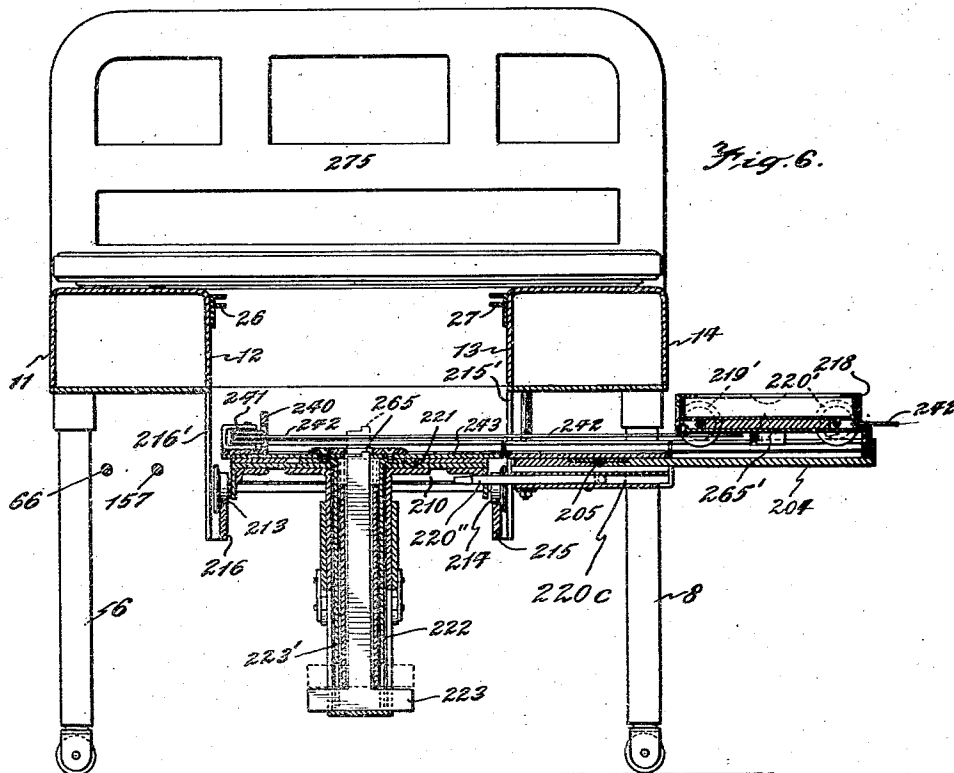
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6 Sheets-Sheet 5



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2,407,892

HOSPITAL BED

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Application May 20, 1943, Serial No. 487,702

3 Claims. (Cl. 5—90)

1

This invention relates to a hospital bed. An object of the invention is to provide a bed with reclining surfaces which can be disposed at many different angles to accommodate a patient in different positions and aid in moving the patient from one position to another. Another object is to provide a bed of this character with a removable portion near the center of the leg-supporting part of the bed. Still another object is to provide a bedpan support for the bed to facilitate the use and handling of this article with the greatest comfort to the patient and minimum labor to the nurse or attendant.

Looking at the drawings,

Fig. 1 is a side elevation of the bed with certain parts thereof shown in raised position;

Fig. 2 is a plan view, partly broken away, of one side of the bed;

Fig. 3 is a section through 3—3 of Fig. 2;

Fig. 4 is an end elevation from the foot of the bed;

Fig. 5 is a section through 5—5 of Fig. 2;

Fig. 6 is a section through 6—6 of Fig. 2;

Fig. 7 is a side elevation of part of the bed;

Fig. 8 is a section through 8—8 of Fig. 7;

Fig. 9 is a section through 9—9 of Fig. 10 showing one of the leg rests in raised position;

Fig. 10 is a plan view of the central leg-supporting portions of the bed;

Fig. 11 is a detail of the leg support and prop therefor;

Fig. 12 is a section through 12—12 of Fig. 11;

Figs. 13 and 14 are fragmentary views, partly in section, of part of the bed.

In the following description and claims, the terms "bottom," "foot," "top," "head," "right," and "left" are used in relation to an occupant of the bed lying on his back. The "bottom" or "foot" of the bed is the end near the occupant's feet, the "top" or "head" of the bed is the end near his head, the "left" is the side near the occupants' left arm, and the "right" the side near his right arm.

That portion of the bed framework adapted to support the torso of the patient occupying the bed comprises side rails 1 and 2 and end rails 3 and 4 which together form a rectangle. This portion of the framework is supported on four legs disposed at the corners of the rectangular frame made up of the side and end members, which legs are shown at 5, 6, 7, and 8.

The leg supporting surfaces of the bed are mounted on a framework made up of a transverse member 10 attached to the cross member 4 and longitudinally disposed frame members

2

11, 12, 13, and 14 (Fig. 4). These longitudinal frame members are arranged in pairs and the members of each pair are joined together at the foot of the bed by transverse pieces 15 and 16. Members 11 and 12 are joined together by the transverse piece 15, and frame members 13 and 14 by transverse piece 16. These longitudinal members 11 and 12 and 13 and 14 form fixed leg-supporting frames disposed along the outside of the bed near the lower portion thereof. Each pair is supported at the bottom end by a pair of legs. Legs 17 and 18 support the members 11 and 12, and the legs 19 and 20 support members 13 and 14. The top edges of members 11 and 12 are joined together by a flat member 21, and members 13 and 14 by a similar member 22. Members 21 and 22 form the fixed leg-supporting surfaces for the bottom of the bed.

Between the surfaces 21 and 22 is a central leg-supporting member 25 adapted to move longitudinally of the bed in tracks 26 and 27 which are attached to frame members 12 and 13, respectively. Member 25 is hinged transversely intermediate its length as shown at 45. The member 25 may be wholly or partly removed by drawing it outwardly from the foot of the bed, thus leaving the space between the members 21 and 22 unobstructed.

On the sliding member 25 are mounted a pair of folding leg rests 28 and 29. These leg-supporting members are hinged at the middle thereof, as shown at 30 and 31, respectively, and at the upper ends thereof they are hinged to the member 25 at 32 and 33.

The ends of members 28 and 29 have a short turned-up portion shown at 34 in Fig. 9. These end portions are designed to engage underneath transversely disposed tracks 35, 35' and 35'' which run across member 25 near the lower end thereof to hold the leg supports in the general position shown in Fig. 1.

Supports 28 and 29 may also be positioned as shown in Fig. 9, that is, with the lower part thereof supported in a horizontal plane. This is accomplished by means of suitable supporting upright members, one of which is shown at 36. This member and its cooperation with member 25 is shown in Figs. 11 and 12. Longitudinally of member 25 are a pair of grooves 37 and 38 (Fig. 10) which are located under the center line of supports 28 and 29 near the lower or foot end thereof. These grooves are designed to accommodate the supports 36. Each support 36 has two hinges, one near the middle thereof, such as that shown at 39 (Fig. 11), and one near

3

one end thereof, such as that shown at 40. That portion of the supporting member which is shown in the groove 37 is marked 36' and is somewhat wider than the groove 37 and designed to slide in slots 41 and 41' (Fig. 12). That portion of the member 36 which is shown in a vertical position in Fig. 11 and which is marked 36'' is somewhat narrower than the groove 37 so as to permit the whole support to slide back and forth in the grooves 41 and 41'. The hinge 39 is so constructed that the member 36'' can move in a counterclockwise direction from the position shown in Fig. 11, but cannot move any further in a clockwise direction therefrom. On the hinge 40 is a short square-cut catch marked 42. When this is raised into the position shown in Figs 11 and 12, it will lock against the tracks 35, 35' or 35'' and prevent the support from moving to the right, as seen in Fig. 11. Because of the hinge construction which permits the element 42 to move in a clockwise direction, as seen in Fig. 11, the whole support may slide to the left, in which event the member 42 can be dropped down and slid along inside the groove 37. This construction permits the support 35 to be located in various positions longitudinally of the member 25 and at the same time prevents movement of the support 35 to the right, as seen in Fig. 9, after the locking member 42 is raised and forced into contact with the tracks 35, 35' or 35''. Suitable holes in leg supports 28 and 29 are designed to receive the upper ends of supports 35, as shown in Fig. 11. One of these holes is shown at 43 (Fig. 11). A block 44 may be used to more readily locate the support in relation to the hole 43.

The member 25 is hinged transversely near the center thereof at 45. When the supporting members 23 and 29 are lying flat on the member 25, hinges 30 and 31 will lie above hinge 45. With this construction the member 25 may be drawn out until the hinge 45 reaches the lower edge of the bed and then the projecting portion of the member 25 and the leg-supporting members 28 and 29 may be dropped down into the position shown in Fig. 2.

The torso-supporting portion of the bed includes a rectangular framework made up of longitudinal members 51 and 52 and transverse members 53 and 54 (Fig. 1). These members 51, 52, 53, and 54 each have an L-shaped cross section, with the horizontal surface thereof forming the bottom of the framework. This rectangular framework is hinged at 55 and 56 to the longitudinal members 1 and 2 and is designed so that the head end may be raised and lowered, pivoting around the pivot points 55 and 56. The mechanism for accomplishing this result consists of two pairs of hinged arms, one pair at each side of the framework.

At the right side of the bed are arms 57 and 58 (Fig. 1), and at the left side of the bed are arms 59 and 60 (Fig. 5). Arms 57 and 58 are hinged together at 61, and arms 59 and 60 at 62. The end of arm 59 opposite to pin 62 is keyed to transverse shaft 63. Arm 57 is attached to a short depending lever 64 which is also mounted on the shaft 63. Lever 64 is equipped with a nut 65 through which passes a threaded shaft 66 which extends down to the foot of the bed and on which is a crank 67. This shaft is mounted in a suitable bearing 68 on angle support 69 which is secured to transverse piece 70 connecting members 11 and 12. The upper end of arms 58 and 60 are pivotally connected at 71 and 72,

4

respectively, to ears 73 and 74 of side members 52 and 51, respectively.

When the crank 67 is turned so as to rotate lever 64 clockwise (Fig. 1) around shaft 63, arms 57 and 59 are also rotated in the same direction, and the ends with pins 61 and 62 move upwardly, with the result that the main movable framework of the bed also moves upwardly. In this fashion the main framework may be pivoted around the pivot points 55 and 56. Because the cross piece 3 is lower than transverse members 1 and 2, the main movable framework may be lowered below a horizontal plane so that the head thereof may move below the top of the members 1 and 2. This is desirable because sometimes it is necessary to maintain the patient's head lower than his feet.

Within the main movable framework at the torso-supporting end of the bed are a pair of auxiliary frames, each of which is hinged along the longitudinal center line of the bed. The auxiliary framework at the right side of the bed consists of transverse members 75 and 77 (Fig. 1) connected together by longitudinal members 78 and 79 (Fig. 3). This auxiliary framework is pivoted at 80 and 81 (Fig. 2) to the main transverse members 53 and 54 of the main movable framework. A similar framework is disposed on the left side of the bed and consists of longitudinal members 82 and 84 (Fig. 3) and transverse members 85 and 86 (Fig. 5). This auxiliary framework is also pivoted to the transverse members 53 and 54 of the main movable framework at 89 and 90.

The left-hand auxiliary framework may be moved about its pivot points 89 and 90 by means of pivoted arms 100 and 101 (Figs. 2 and 5) so that the outer edge of said framework may be raised and lowered. Arms 100 and 101 are keyed to a longitudinal shaft 102 mounted on a suitable supporting bracket 103. Depending arm 104 is keyed or pinned to shaft 102 and carries a nut 105 through which is a threaded shaft 106. Upon rotation of shaft 106, arm 104 is moved so as to rotate shaft 102 which in turn rotates arms 100 and 101 so that the auxiliary framework on the left side of the bed may be moved about the pivot points 89 and 90 to raise or lower the outer edge thereof.

The corresponding auxiliary framework on the right side of the bed may be moved about its pivot points in a similar manner. Arms 108 and 109 are equipped at the free ends thereof with rollers 110 and 111 (Fig. 1), respectively, designed to cooperate with suitable tracks 112 and 113 on the underside of the right-hand auxiliary framework. Arms 108 and 109 are keyed or pinned to longitudinally disposed shaft 115 which is mounted in suitable supporting brackets 116. Depending from shaft 115 is an arm 118 equipped with a nut 119 through which passes threaded shaft 120. Shaft 120 runs transversely of the bed to the left side thereof and is supported on bearing 121 (Fig. 2) and at the outer end is equipped with a suitable shank 122 to receive a removable crank. Upon rotation of shaft 120, arms 108 and 109 move about the shaft 115 and serve to raise and lower the outer edge of the right-hand auxiliary framework, moving it about its pivot points 80 and 81.

In the upper portion of each auxiliary movable framework is a secondary hinged framework designed to pivot on a transverse line disposed about half-way between the bottom and top of the torso portion of the bed. This secondary framework

5

for the right-hand side of the bed comprises transverse members 125 and 126 and longitudinal members 127 and 128. A longitudinal track 130 is disposed on the underside of this secondary framework. The framework is pivoted at 131 to the right hand auxiliary movable framework. This secondary framework supports a flat sheet 133.

The left-hand side of the bed is equipped with a similar secondary hinged framework made up of transverse members 135 and 136 and longitudinal members 137 and 138. This secondary framework supports a flat surface member 140 and the whole framework is hinged at 141 to the left hand auxiliary movable framework. This left-hand secondary framework is also equipped with a suitable track 142 on the underside thereof.

The head ends of both the secondary frameworks are adapted to be raised and lowered by means of a pair of pivoted arms shown at 150 (Fig. 1) and 152 (Fig. 5). Arm 150 is designed to raise the right-hand secondary framework, and arm 152 the left-hand one, but both are designed to move in unison. Arms 150 and 152 are keyed or pinned to transverse sleeve 62s which is mounted on shaft 63 (Figs. 13 and 14). To sleeve 62s is attached a depending arm 155 equipped with a nut 156 in which operates a threaded shaft 157 which runs longitudinally of the bed, down to the foot thereof. This shaft is supported on brackets 69 and is equipped at the end thereof with a suitable crank 158. Upon rotation of this shaft, transverse sleeve 62s rotates in its bearings and moves arms 150 and 152, which, in turn, raise and lower together the right and left secondary frameworks so that the head of a patient in the bed may be raised or lowered.

At the head of the bed are a pair of hinged supports. The support at the right-hand side is shown at 160, and that at the left side at 161. These may be swung toward the longitudinal center line of the bed or away therefrom. When swung inwardly, they serve to support the head end of the main movable framework when said framework is lowered down onto said supports. When it is desired to move the framework down lower than the horizontal plane, these supports are swung outwardly into the dotted position of support 161 shown in Fig. 2 and this permits this main movable frame to move down below the horizontal plane at the head end.

With the construction heretofore described it will be seen that the center portion of the leg-supporting part of the bed may be entirely removed by sliding it out as heretofore described. The leg-supporting surfaces on this portion may be raised to support either or both legs in nearly any desired position. The torso-supporting portion of the bed is pivoted as a whole near the lower part thereof so that the head of it may be raised or lowered. The head part of this whole upper portion of the bed raises and lowers on operation of one of the crank arms. Upon operation of a similar crank arm, only the upper half of this torso-supporting portion may be raised and lowered at the head. Provision is also made for raising and lowering the outer edges of either side of the torso-supporting portion of the bed so that a longitudinal trough may be formed in the center of the bed or either or both sides may be used to assist in turning the patient over in bed.

A unique feature of this hospital bed is the support for a bedpan or similar utensil. This consists in general of a transverse track disposed

6

underneath the frame of the leg-supporting surface of the bed near the head end of said leg-supporting portion. That portion of this track which is near the center of the bed is on a platform supported on a longitudinally arranged track so that that portion of the support may be moved up under the lower part of the torso-supporting part of the bed so as to leave the center part of the leg-supporting portion unobstructed after the center support is removed as heretofore described.

The transverse track comprises rails 200 and 201. This transverse track may be divided into three portions, an outside movable portion shown at O, a central stationary portion shown at C, and an inside movable portion shown at I. The outside portion O is mounted on a hinged platform 204. This platform is hinged transversely at 205 at a point midway between the outside and inside edges thereof. That portion of the platform between the end of tracks 200 and 201 and the inside edge is designed to slide inside the stationary track-supporting portion C as shown at 206 (Fig. 8). When the hinged part 204 is raised into the position shown in Fig. 4, the supporting portion O may be pushed inside of the stationary portion C so that it will remain in the position shown in Fig. 4 and when in this position that portion of the tracks 200 and 201 on supporting portion O will make a continuous track with the corresponding portions on the stationary central support C. When not in use, this portion O may be folded down, as shown in Fig. 8, merely by removing it part away from the center portion C and allowing it to drop down about the hinge 205.

The inside part (or portion I) of the tracks 200 and 201 is mounted on a movable car 210. This movable car is equipped with wheels 211, 212, 213, and 214, which run on longitudinal tracks 215 and 216. Tracks 215 and 216 run longitudinally of the bed on the underside thereof in the middle. They are suspended from the underside of the bed by means of track supports 215' and 216'. They extend from a point somewhat below the middle of the leg-supporting portion of the bed back under the lower part of the torso-supporting portion of the bed. A small carrier car 218 mounted on wheels 219, 219', 220, and 220' is designed to carry the bedpan or other utensil and travel along tracks 200 and 201 from outside the edge of the bed to the center of the bed. A suitable sliding locking pin 220'' is designed to lock car 210 in place so that the tracks on portion I will line up with the tracks on stationary portion C when it is desired to move the car 218 from the portion I to the portion C or vice versa. Pin or bolt 220'' slides transversely of the bed in channel 220c.

On the car 210 is a vertically movable platform 221 which is mounted on a vertical column 222, the bottom portion of which is slotted. A transverse arm 223 is connected to the bottom of a movable column 223', the upper end of which forms a locking pin 265. To the outer ends of arm 223 are attached cables 224 and 225 running over pulleys 226 and 227, which pulleys are mounted on the vertical casing 228 attached to the underside of the car 210. A pair of reels 230 and 231 designed to be rotated by shaft 232, to which is attached crank 233, are adapted to reel up cables 224 and 225 to lift the vertically movable column 223' in the side slots in column 222, which latter carries on top thereof the platform which supports the tracks 200 and 201 on which the movable support 218 is designed to ride.

7

When cross arm 223 reaches the top of the slots in column 222, the latter will rise on the arm and carry the platform 221 upwardly.

A suitable stop member 240 against which the car 218 may be positioned to hold it in a predetermined location is on top of the vertically movable platform 221. Inside stop 240 is a pulley 241 over which passes a flexible cable 242, one end of which is attached to one side of car 218 and the other end to the other side of car 218. The cable is long enough so that the excess comes well outside the edge of the bed where it can be conveniently manipulated to draw the car 218 in and out along tracks 200 and 201.

The tracks 200 and 201 are lined up so that those portions of the tracks which are on portion I of the support are in alignment with portions of the tracks on support C. Locking pin 220' is designed to hold car 210 in such position that all parts of the tracks 200 and 201 will be in alignment and, of course, when so positioned, the car 218 may roll freely along tracks 200 and 201 from the portion designated by O right straight through the portion designated I or back again.

Column 222 may be raised and lowered in the casing 228 by means of the cable and pulley arrangement heretofore described and, when in the raised position, is held there by catch 246 (Fig. 5), which catch is controlled by handle 247 on shaft 243 (Fig. 4). Upon rotation of shaft 243 in a clockwise direction, as viewed in Figs. 1 and 5, links 249, 250, and 260 will move in a clockwise direction about pivot point 261. The left end (Fig. 1) of link 260 permits the catch 246 to move counterclockwise around pivot point 262 and disengage from arm 223 to permit it to drop into its lowered position.

Locking pin 265 on column 223' slides up through the platform 221 upon initial upward movement of arm 223 and engages U-shaped member 265' on the bottom of car 218. The upper end of it is formed into a flat locking member. This flat locking member is designed to engage the underside of the car 218 to make it immovable on the platform 221. As the arm 223 is raised, it initially raises the member 223' until the flat locking end 265 engages the car 218 and prevents motion thereof. Further upward movement of the bar 223 into the dotted position shown in Fig. 6 serves to engage the lower edges of column 222, and as the bar 223 is lifted further, the platform 243 moves upwardly with it, carrying the tracks and the car 218 up to a level so that the top of said car is in approximately the same horizontal plane as the upper surface of the bed.

In operation, when it is desired to move a bedpan or similar utensil in towards the center of the bed, it may be deposited on the car 218, when said car is in the position shown in Fig. 6. By pulling on flexible cable 242, which cable passes around the pulley 241, the car may be drawn in until it is over the flat plate 243. After the central lower portion of the bed, which has been designated as 25, has been drawn out and lowered as shown in Figs. 2 and 5, the car-supporting platform 243 may be raised by turning crank 233. This will serve to wind up the cables 224 and 225 on the pulleys 230 and 231 so that, as the bar 223 raises, the locking upper end portion 265 of the inner telescoping column 223' first locks the car in position. Continued upward movement of the bar 223 picks up the outer movable telescoping member 222 and carries it with the supporting platform 243 upward until the

8

upper position shown in Fig. 5 is reached when the bar 223 is locked in place by catch 246.

When it is desired to lower the platform 243, the locking catch control handle 247 is rotated, the catch 246 released, and the platform 243 drops of its own weight or may be slowly lowered with the aid of crank 233. The car may be drawn out by means of the cable 242. After the bedpan or other utensil is removed, the car may be pushed back onto the platform 243, the track-supporting portion O may be dropped into the position shown in Fig. 7, and the whole elevating mechanism mounted on carriage 221 which is supported on the wheels 213 and 214 may be rolled back toward the head of the bed until it is under the torso-supporting portion of the bed, thus leaving an unobstructed passageway between the two stationary leg-supporting portions of the bed, to which access may be had by complete removal of the portion 25.

Sometimes it is advantageous to arrange a head piece on a bed of this kind and one is shown at 275 secured to the transverse member 3 by means of bolts 276 and 277 which pass through annular spacing members 278 and 279. The head of the bed may be secured between the head of the bolts and one end of the spacing members, as shown in Figs. 2 and 5.

I claim:

1. The combination with a hospital bed having a frame, a torso-supporting portion and a leg-supporting portion mounted on said frame, of a centrally disposed section slidably mounted in said leg-supporting portion for movement to provide an opening in said leg-supporting portion, a bedpan support and track means disposed underneath the leg-supporting portion, means mounting said track means on said frame for disposition from a point beneath said opening to a position beyond an edge of said frame, said support being movable along said track means from a station below said opening to a station outside said frame, said track mounting means including a platform located underneath the leg-supporting portion, means mounting said platform on said bed frame for movement in a horizontal direction therebeneath, including means for raising and lowering said platform, a portion of said track means being carried upon said platform and movable therewith both horizontally and in the raising and lowering thereof, said movable portion of said track means being thereby adapted to be aligned with the non-movable portion, whereby said bed pan support may be placed upon the movable platform and raised therewith into said opening or may be lowered from said opening and moved along said track means.

2. The combination with a hospital bed having a frame, a torso-supporting portion and a leg-supporting portion mounted on said frame, of a centrally disposed section slidably mounted in said leg-supporting portion for movement to provide an opening in said leg-supporting portion, a bedpan support and track means disposed underneath the leg-supporting portion, means mounting said track means on said frame for disposition from a point beneath said opening to a position beyond an edge of said frame, said support being movable along said track means from a station in register with said opening to a station out of register with said opening, said track mounting means including a platform located underneath the leg-supporting portion, means mounting said platform on said bed frame for raising and lowering said platform, a portion

9

of said track means being carried upon said platform and movable therewith in the raising and lowering thereof, said movable portion of said track means being thereby adapted to be aligned with the non-movable portion, whereby said bed pan support may be placed upon the movable platform and raised therewith into said opening or may be lowered from said opening and moved along said track means.

3. The combination with a hospital bed having a frame and a leg-supporting portion mounted on said frame, of a centrally disposed section slidably mounted in said leg-supporting portion for movement to provide an opening in said leg-supporting portion, a bed-pan support and track means disposed underneath the leg-supporting portion, means mounting said track means on said frame for disposition from a point beneath said opening to a position beyond an edge of said

10

frame, said support being movable along said track means from a station below said opening to a station outside said frame, said track mounting means including a platform underneath the leg-supporting portion, means mounting said platform on said bed frame for movement in a direction substantially parallel to said leg-supporting portion, including means for raising and lowering said platform, a portion of said track means being carried upon said platform and movable therewith, said movable portion of said track means being thereby adapted to be aligned with the non-movable portion, whereby said bed pan support may be placed upon the movable platform and raised therewith into said opening or may be lowered from said opening and moved along said track means.

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