

Oct. 26, 1965

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3,213,469

HOSPITAL BED

Filed Dec. 4, 1961

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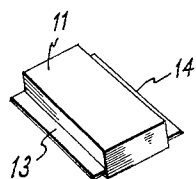
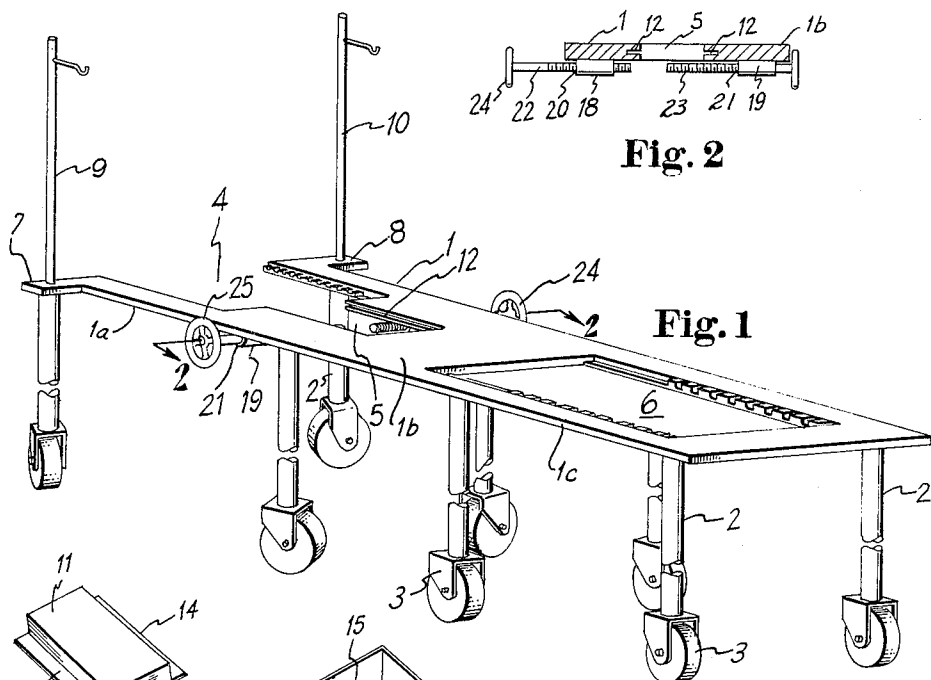


Fig. 7

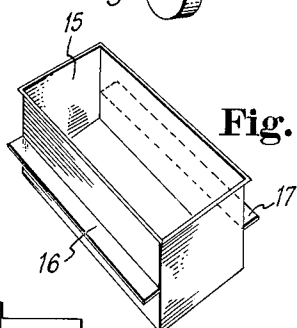


Fig. 6

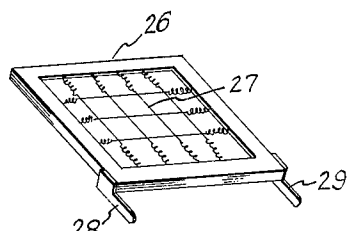


Fig. 3

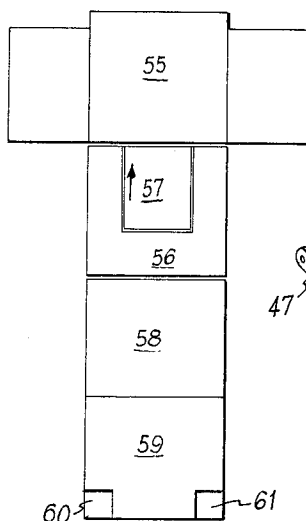


Fig. 8

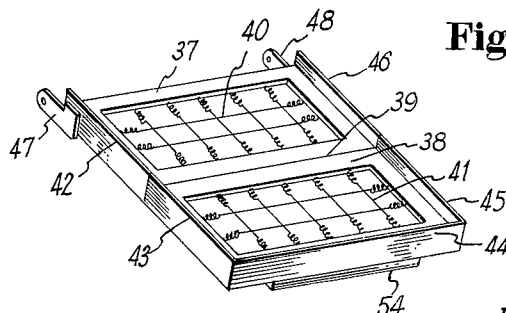


Fig. 4

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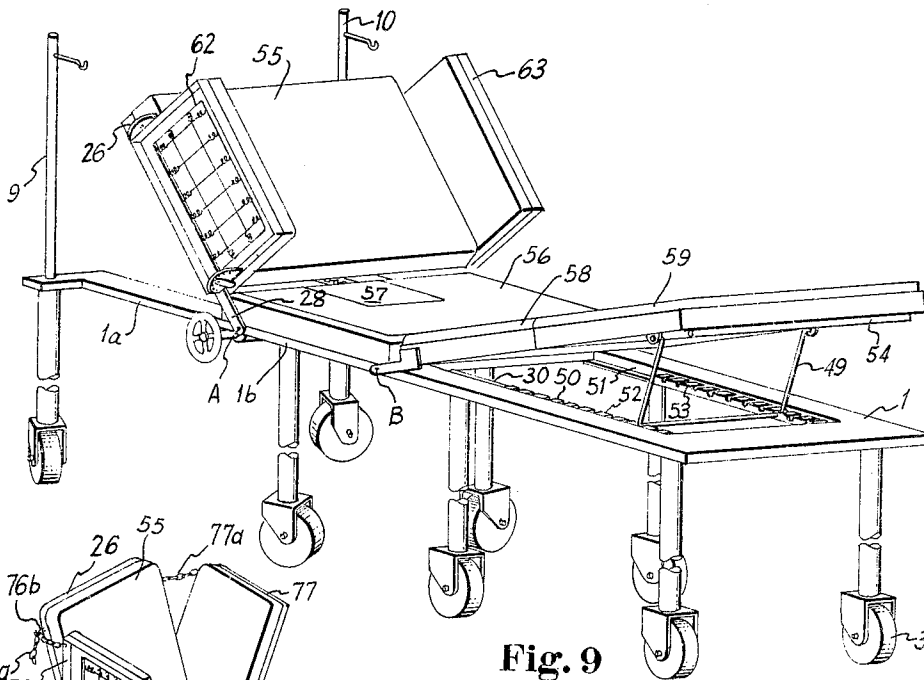


Fig. 9

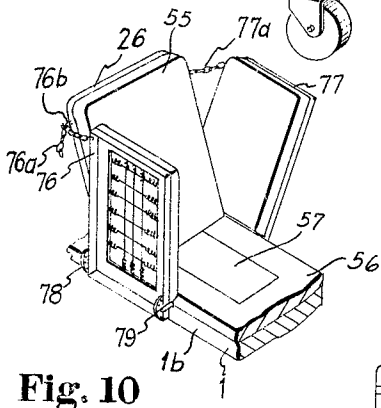


Fig. 10

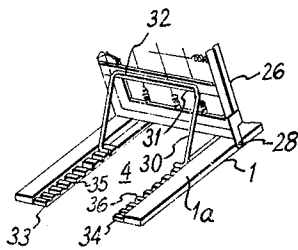


Fig. 5

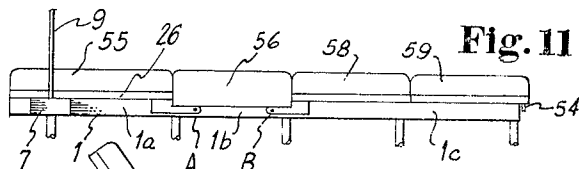


Fig. 11

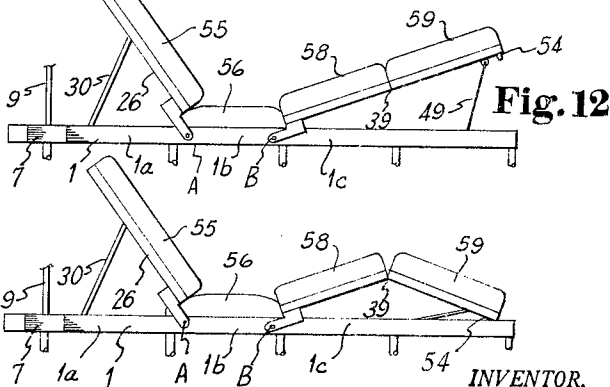


Fig. 12

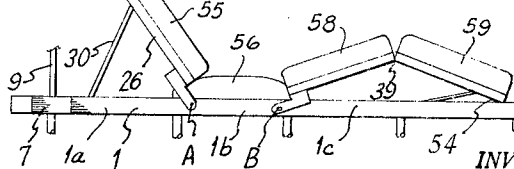


Fig. 13

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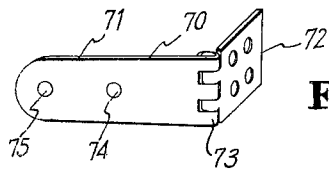


Fig. 15

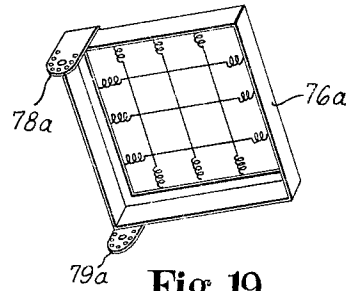


Fig. 19

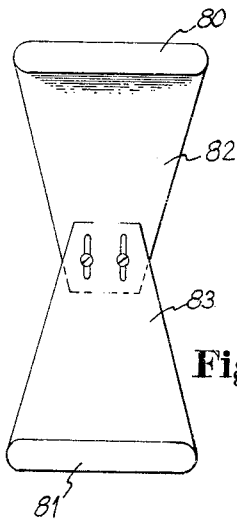


Fig. 18

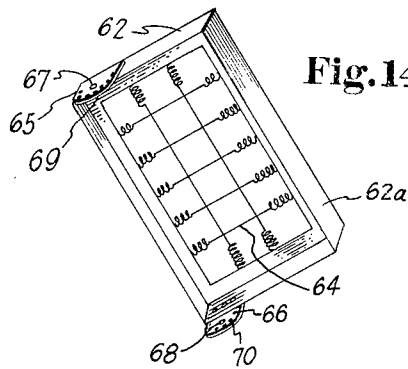


Fig. 14

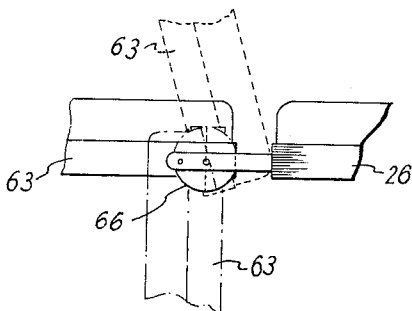


Fig. 16

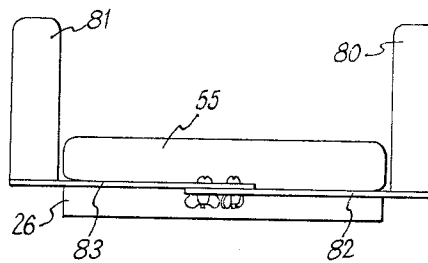


Fig. 17

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15 Claims. (Cl. 5—68)

The invention relates to a hospital bed, and more particularly to a hospital bed for cardiac patients or those suffering from other diseases which require the patient to be kept in a nearly upright or reclining position. Very often it is necessary that such patients be moved as little as possible, and that they be subjected to the least possible physical exertion even while performing the normal body functions.

It is therefore an object of the invention to provide a hospital bed or analogous apparatus with adjustable head and foot portions which may be raised or lowered to any desired position with respect to a generally horizontal central portion.

It is an object of the invention to provide a hospital bed with built-in removable bed pan facilities.

It is an object of the invention to provide a hospital bed with bed pan facilities which may be inserted or removed from the bed without any physical exertion or movement on the part of the patient.

It is an object of the invention to provide a hospital bed which is relatively narrow and is provided with supporting and confining means for those patients whose illness requires that they remain in the reclining position for long periods of time and even during sleep.

It is a further object of this invention to provide a hospital bed capable of sustaining a patient in an upright or nearly upright seated position, with adjustable means thereon for providing the patient with lateral support for safety as well as comfort.

These and other objects of the invention, which will be referred to hereinafter or will be clear to the skilled worker in the art upon reading these specifications, are accomplished in that manner and by that construction and arrangement of parts of which certain exemplary embodiments will now be described. Reference is made to the accompanying drawings wherein:

FIG. 1 is a perspective view of the frame of the hospital bed.

FIG. 2 is a sectional view taken along the line 2—2 of FIG. 1.

FIG. 3 is a perspective view of the adjustable head rest.

FIG. 4 is a perspective view of the adjustable foot rest.

FIG. 5 is a partial perspective view of the head end of the bed frame showing means for supporting the head rest in adjusted position.

FIG. 6 is a perspective view of a bed pan member.

FIG. 7 is a perspective view of a frame member for use in place of the bed pan.

FIG. 8 is a plan view of the various mattress segments.

FIG. 9 is a perspective view of the hospital bed of this invention showing the head rest, foot rest, and mattress segments in place.

FIG. 10 is a partial perspective view of the head end of the hospital bed illustrating an alternate placement of the side supports.

FIG. 11 is a partial side elevation of the hospital bed with the head rest and foot rest in horizontal position.

FIG. 12 is a partial elevational view of the hospital bed with the head rest and foot rest members in elevated position.

FIG. 13 is a partial elevational view of the hospital bed showing the head rest in raised position and the foot rest in an angularly raised position.

FIG. 14 is a perspective view of the under side of one of the side supports.

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FIG. 15 is a plan view of one form of hinge member.

FIG. 16 is a partial elevational view showing various positions of a side support with respect to the head rest.

FIG. 17 is an elevational view of another form of side support means.

FIG. 18 is a plan view thereof.

FIG. 19 is a perspective view of an additional form of side support means.

Referring to FIG. 1, the bed frame comprises a horizontal frame member 1, supported by a plurality of legs 2. In the preferred embodiment, the frame 1 is shown as being supported by eight such legs, which may be provided with rubber-tired casters 3. At the head end 1a, the frame 1 is open as at 4 with smaller open portion 5 extending into the middle or central portion 1b of the frame. The foot end 1c of the frame contains a rectangular opening 6. The openings 4, 5 and 6 will be more fully described hereinafter. At the head or open end 1a, the frame 1 has outwardly extending arms 7 and 8. Vertical IV supports (for holding plasma bottles etc.) 9 and 10 are removably mounted to the outwardly extending portions 7 and 8 respectively by any suitable means as, for example, providing the extended portions 7 and 8 with sockets suitable for receiving the ends of the rod-like supports 9 and 10 for vessels used in intravenous treatments.

FIG. 7 illustrates a rectangular member 11 of such dimensions as to fit snugly in the open portion 5 of the frame 1. That part of the frame 1 forming the long sides of the opening 5 is provided with grooves indicated at 12. The frame member 11 is provided at both of its long sides with flanges 13 and 14. The flanges 13 and 14 are adapted to slide in the grooves 12 in the frame 1 thereby holding the frame member 11 in place when it is introduced into the open area 5 from the head end of the bed.

FIG. 6 illustrates the bed pan of the present invention which comprises a rectangular pan-like structure 15. The pan 15 is of such suitable length and width as to fit snugly in the open area 5. The pan is provided with rolled edges at the top and flanges 16 and 17 along its sides adapted to slide in the grooves 12 in the main frame 1, so that the pan may be substituted for the frame member 11. While size is not a limitation on the present invention, it will be understood by the skilled worker in the art that the dimensions of the bed pan 15, the frame member 11 and the open space 5 in the main frame are all related to each other. In the preferred embodiment, it has been found that a bed pan 12 in. long, 10 in. wide, and 8 in. deep is well suited for the purpose. The flanges 16 and 17 are so located on the bed pan 15 that when the bed pan is in position, the rolled upper edges thereof will be at approximately the same height above the main frame as is the upper surface of the surrounding mattress member, more fully described hereinafter.

When the bed pan is not in use, and the frame member 11 is inserted in the open space 5, it may be found desirable to support the frame member 11 from beneath, especially when dealing with a heavy patient. FIG. 2 illustrates a simple method of providing such support. The under side of the main frame 1 is provided with downwardly depending members 18 and 19 on either side of the open space 5. The members 18 and 19 contain internally threaded perforations 20 and 21 respectively. The perforations 20 and 21 are coaxial, and their axis would approximately bisect the open space 5. Rods 22 and 23 are threaded into the members 18 and 19 respectively and have handle means 24 and 25. When the rod members 22 and 23 have been turned inwardly to their innermost position they will meet beneath the frame member 11 and afford added support to it. When the members 22 and 23 have been turned to their outward

position, they will permit the frame member 11 to be removed and the bed pan 15 to be inserted in its place. The rod member 23 is illustrated in its innermost position while the rod member 22 is illustrated in its retracted position.

The head rest is shown in FIG. 3 and comprises an open rectangular frame 26 with downwardly depending sides for strength and rigidity. The frame 26 is provided with any well known form of spring system, generally indicated at 27. Hinge arms 28 and 29 are provided on either side of the frame 26 near its lower edge. The hinge arms are of L-shaped configuration with their long arms extending parallel to the frame 26 and below it. The ends of the hinge arms 28 and 29 are pivoted to the main frame by any suitable means such as rivets or bolts, at a point A on the main frame (see FIG. 9). As will be seen from FIG. 11, when the head rest is in horizontal position, the hinge point A is somewhat forward of the bottom edge of the frame 26. Therefore, when the head rest is placed in a raised position, this hinge arrangement will permit it to ride up and over a mattress member on the central area 1b of the main frame.

While it is within the scope of the present invention to provide the head rest with crank or motorized means well known in the art to hold it in a plurality of raised positions, a simplified hand operated means is illustrated in FIG. 5. A U-shaped member 30 is hinged to the under side of the main frame 26 at the points 31 and 32. The main frame 1 underlying the head rest is provided at either side with an inwardly extending flange indicated at 33 and 34. The flanges 33 and 34 are provided with a plurality of notches 35 and 36 respectively. Therefore, when the head rest is raised, the ends of the U-shaped member 30 may be located in any one of a number of related notches 35 and 36 enabling the head rest to assume a plurality of positions ranging from the horizontal to the vertical or nearly vertical. This arrangement not only provides adjustability for the head rest, but also permits the open space 4 to remain unobstructed, thereby allowing free access to the open space 5 for insertion either of the frame member 11 or the bed pan 15 when the head rest is in a raised position.

The foot rest, FIG. 4, preferably comprises two rectangular frame members 37 and 38 which are hinged together as at 39. Both of the frames are provided with spring structures generally indicated at 40 and 41. The two sides of the frame 37 and the two sides and bottom end of the frame 38 are provided with raised edge portions 42 through 46. The purpose of these raised portions is to hold in place that part of the mattress which covers the frames 37 and 38. The frame 37 is provided at its free end with hinge arms 47 and 48 similar to the hinge arms 28 and 29 of the head rest. The hinge arms 47 and 48 are pivotally affixed to the main frame 1 at the points designated as B, as will be seen in FIG. 11. This hinging arrangement permits the foot rest portion of the bed to ride up over the central mattress section when in raised position.

Again, it is within the spirit of the present invention to provide crank operated or motor operated means for raising the foot section; but FIGS. 9, 12 and 13 illustrate a simple hand operated means. As will be seen in FIGS. 9 and 12, a U-shaped member 49 has its ends pivotally affixed to the inside surface of the downwardly extending sides of the frame 38 by any suitable means such as riveting or the like. The inside edges of the main frame are provided with flanges 50 and 51 containing a plurality of notches 52 and 53 respectively, similar to the flanges and notches at the head end 1a of the main frame. The foot rest, therefore, may be manually raised from a horizontal position and supported at any desired angle by merely locating the U-shaped member 49 in any related pair of notches in the sets of notches 52 and 53. It may also be found desirable to raise the foot rest in an angular

position as shown in FIG. 13. As will be noted from FIGS. 4, 12 and 13, that portion of the frame 38 forming the end-most part of the bed is provided with a downwardly extending flange 54. The flange 54 is of sufficient length along the frame 38 to engage the sets of notches 52 and 53. Therefore, to achieve an angular raised position, the foot rest is raised and the frame member 38 is bent downwardly at the hinge 39 so that the flange 54 may be engaged in any related pair of notches in the sets of notches 52 and 53.

FIG. 8 is a plan view of the various mattress segments. While the various mattress segments may be articulated to form a single unit, or may be completely separate from each other, in a preferred embodiment of the present invention the mattress segments comprise six distinct mattress parts. The mattress segments may be of any suitable construction as, for example, foam rubber with a plastic cover. The mattress part illustrated at 55 is of such size and shape as to cover the head rest frame 26. This mattress part may be provided with ties on its under surface (not shown) by which it may be more firmly held in place on the frame 26.

A second mattress part 56 is of generally U-shape configuration, and is intended to cover the central area 1b of the main frame between the head rest and the foot rest. It will be noted that this section 1b of the main frame may be provided with low upturned edges similar to those on the frames 37 and 38 to prevent lateral movement of the mattress 56. A third mattress part 57 is intended to fit into the U-shaped configuration of the mattress 56 and covers the bed pan area of the bed. This mattress part may, if desired, be permanently affixed to the frame portion 11 by any suitable means. The fourth mattress part is made up of two segments 58 and 59 and is intended to cover the foot rest frames 37 and 38 respectively. While these two segments may be wholly distinct from each other, it has been found desirable to make them a single articulated unit. These segments may be provided with mattress ties on their lower surface more firmly to affix them to the frames 37 and 38, and will be held from lateral or endwise movement by the low raised edges 42 through 46. It has been found, especially in the case of patients who are required to remain in bed for long periods of time, that their comfort may be greatly increased by relieving pressure at the heels and ankles. Therefore, the mattress section 59 may be provided with two depressed areas 60 and 61 in which the patient's heels can rest.

In the case of a patient whose sickness requires that he be kept in an upright reclining or sitting position, the hospital bed of the present invention affords means for lateral support to add to the patient's comfort, as well as to his safety. The lateral support means are illustrated in FIGS. 9 and 10 and in FIGS. 14 and 16. FIG. 14 illustrates from the under side one of two identical support means 62 and 63. The means 62 comprises a rectangular frame 62a with spring means generally indicated at 64. The frame and spring means are of the same construction, or construction similar to the frame and spring means of the head and foot rest members, with sides that extend downwardly. The support means 62 and 63 are adapted to be adjustably affixed to the head rest frame 26 (FIG. 9). Adjustable attachment means are shown in FIGS. 14 through 16. The top and bottom side members of the frame 63 are provided with segments 65 and 66 respectively. These segments have perforations at their centers indicated at 67 and 68. A plurality of perforations 69 and 70 are circumferentially spaced near the outer edge of the segments 65 and 66 respectively.

Hinge means affixed to the head rest frame 26 are illustrated in FIG. 15. For purposes of an exemplary embodiment, the hinge means 70 is shown as being made of two parts 71 and 72. The portion 72 is provided with a plurality of perforations by which it may be

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attached to the frame 26 with bolts, rivets or the like. The section 71 is hingedly attached to the portion 72 at the point 73. The part 71 is provided with two perforations 74 and 75. Referring to FIG. 16 which shows the hinge means affixed to the frame 26 and pivoted to the segment 66, it will be noted that the frame 62 is thus hingedly attached to the frame 26 by means of a pin, rivet or bolt through the perforation 74 in the hinge part 71 and the perforation 68 in the segment 66. FIG. 16 shows that by aligning the perforation 75 in the hinge member 71 with any one of the perforations 70 in the segment 66 and placing a bolt or pin therethrough, the support may be positioned at any one of a plurality of angles ranging from the horizontal to the vertical and firmly held in position. As will also be noted from FIG. 16, by removing the pin or bolt from the segment 66 and the hinge part 71, the side supports may be allowed to swing downwardly into a vertical position, so that when the head rest is lowered to a horizontal position the side support may hang downwardly and out of the way.

FIG. 10 shows an alternate construction illustrating side supports 76 and 77, similar in construction to the side supports 62 and 63. As will be seen from FIG. 10, however, the side supports 76 and 77 are hinged at one of their short sides to the main frame 1 of the hospital bed rather than to the head rest. Again the use of hinge means and segment members generally indicated at 78 and 79 is applied to this embodiment, and these means are similar in construction and function to those illustrated in FIGS. 14 through 16. This embodiment permits a different angular relationship between the side supports 76 and 77 and the back rest member. The hinge means shown in FIG. 15 comprising the parts 71 and 72 has been illustrated as a member composed of two articulated related parts so that if it is desired to remove a side support altogether, the part 71 may be folded over the part 72 along the frame to which the part 72 is affixed, thereby eliminating any unnecessary protrusions or obstructions from the frame. If the side supports are to be affixed either to the head rest frame or the main frame of the bed permanently, it is within the scope of the invention to provide a hinge means in which the parts 71 and 72 are integral and form a right angle to each other. It is also within the scope of the invention to provide side supports which have four segments located thereon positioned as shown in both FIG. 9 and FIG. 10, so that a single side support may be hingedly affixed either to the head rest or the main frame. Similarly it is within the scope of the present invention to provide a side support 76a (FIG. 19) which is essentially square so that hinge means such as those shown in FIG. 15 may be mounted both to the head rest frame and the main frame, both sets of hinges being the same distance apart. Thus, a single pair of segments 78a and 79a mounted on the side support frame may be used with either pair of hinge members.

Where the hospital bed of this invention is designed for cardiac patients who must remain in a reclining position for long periods of time and during sleep, the side supports described herein serve not only to prevent lateral displacement of the patient as by falling over, but also contribute very greatly to his comfort because he is able to recline against them. The side support members may be made in various sizes and shapes, and if desired, may be low enough in vertical height to permit the patient to rest his arms on them. For cardiac patients the structure of this invention may be made quite narrow, say of the order of 30 in., so that the side supports may be brought against sides of the patient to prevent lateral shifting. At the same time, it is convenient so to mount the side supports that they can be swung entirely out of the way when the patient is being given certain kinds of treatment. Additional support means may be provided for either type of side support. For

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example, as illustrated in FIG. 10, chains 76a and 77a may be affixed to the outer edges of the supports 76 and 77 respectively. The head rest frame 26 may be provided with hook means (one of which is shown at 76b) on which any one of various links of the chains may be engaged to provide further support for the upper ends of the side supports.

A form of side support construction in which the supporting means need not be hinged to the bed frame members but can be removed entirely when desired is shown in FIGS. 17 and 18. There padded members 80 and 81 forming the actual side supports are attached respectively at right angles to plate-like members 82 and 83, generally in the form of truncated triangles. The ends of these plate-like members overlap at the center line of the bed and are fastened together, preferably detachably and preferably adjustably by any suitable means. A bolt and wing nut may be employed since the wing nut will pass through the springs of the head rest member 26 when the combined members 82 and 83 are placed thereon beneath the mattress portion 55 of the head rest. If it is desired to fix the angular positions of the elements 82 and 83 rigidly, they may be provided at their ends with a plurality of holes, and a plurality of bolts and wing nuts may be used. The provision of a plurality of holes or slots also facilitates the fastening of the elements 82 and 83 together in different angular relationships where a non-parallel position of the padded members 80 and 81 contributes to the patient's comfort. The arrangement is such that the padded members 80 and 81 can be brought against the sides of the mattress portion 55 in parallel position, or with the lower edges of the padded members against the mattress portion, the remainder of the padded members extending upwardly and outwardly so that the patient can lean against them. The plurality of holes or slots in the members 82 and 83 will enable them to be fastened together in angularly adjusted and in longitudinally adjusted positions.

Since in the illustrated embodiment the head and foot frame members 26, 37 and 38 overlie the frame 1, the mattress portions 56 and 57 for the center section 1b of the bed may be given additional thickness as illustrated in FIG. 11 so that the upper surfaces of all mattress portions will be substantially coplanar when they are in the horizontal position.

Modifications may be made in the present invention without departing from the spirit of it. The invention having been described in certain exemplary embodiments, what is claimed as new and desired to be secured by Letters Patent is:

1. In a therapeutic bed having a head end and a foot end, a main frame with horizontal head, central and foot portions, said horizontal central portion comprising that portion of said main frame upon which a patient may sit, said central portion being cut away in part from the head end of said bed so as to have substantially a U-shape, said head portion of said main frame being cut away in part from the head end of said bed so as to provide access to said cut-away part of said central portion of said main frame, a mattress on said central portion having the same shape in plan as said central portion, a head rest extending from said central portion toward the head end of said bed, said head rest having a mattress and being hinged with respect to said central portion of said main frame in such a way as to be swingable from a horizontal position overlying said head portion of said frame, and in which its mattress is substantially coplanar with the mattress of said central portion of said main frame, to a position in which the head rest and its mattress clear said central portion and its mattress, to permit access to said cut-away part of said central portion of said main frame, and means for holding said head rest in adjusted positions.

2. The structure claimed in claim 1 including a bed pan having a bottom end and side walls shaped to lie within said cut-away part of said central portion of said main

frame, supporting means on the bed pan so that said bed pan may be engaged with said central portion of said main frame within the cut-out part thereof from the head end of said bed.

3. The structure claimed in claim 2 including a supplementary frame member having a mattress and support means, insertable in the cut-away part of said central portion of said main frame.

4. The structure claimed in claim 3 wherein said supporting means are on the side walls of said bed pan and comprise an outwardly extending flange along the central portion of each side wall, and wherein said central portion of said main frame at said cut-out part has grooves to receive said flanges.

5. The structure claimed in claim 3 wherein a foot rest extends from said central portion of said main frame toward the foot end of said bed, said foot rest having a mattress and being hinged with respect to said central portion of said main frame in such a way as to be swingable from a horizontal position in which its mattress is substantially coplanar with the mattress of said central portion of said main frame to a plurality of raised positions, and means for retaining said foot rest in said raised positions.

6. The structure claimed in claim 3 wherein support means are hinged to the sides of said head rest in such a way as to be swingable from a downwardly depending position when not in use to an upward angular position of 90° with respect to said head rest, and means for locking said support means in a plurality of positions ranging from a position wherein said support means are substantially coplanar with said head rest to said upward angular position.

7. The structure claimed in claim 3 wherein support means are hinged to the sides of said main frame in such a way as to coact with said head rest to support a patient and so as to be swingable from a downwardly depending position when not in use to an upward angular position of 90° with respect to said main frame, and means for locking said supports in a plurality of positions ranging from a position wherein said supports are substantially coplanar with said main frame to said upward angular position.

8. The structure claimed in claim 3 including two side supports, each of said side supports having a mattress, said supports being hingeably affixable to at least one of said head rest and said main frame in such a way as to be swingable from a downwardly depending position when not in use, to an upward angular position of 90° with respect to said main frame, and means for locking said supports in a plurality of positions.

9. The structure claimed in claim 3 including adjustable side supports in association with said head rest.

10. The structure claimed in claim 3 wherein said supplementary frame member is provided with an outwardly

extending flange along each of its two longest sides, and wherein said central portion of said main frame at said cut-out part is provided with grooves adapted to receive said flanges.

11. The structure claimed in claim 3 wherein retractable support means are mounted on the under side of said central portion of said main frame adapted to extend beneath and support said supplementary frame member when said member is inserted in said cut-away part of said central portion of said main frame.

12. The structure claimed in claim 5 wherein the mattress for said foot rest has heel-receiving depressions.

13. The structure claimed in claim 5 wherein said foot rest is comprised of two parts, the first of said parts being hinged with respect to said central portion of said main frame, the second of said parts being articulated to said first part along a line transverse the axis of said bed, said foot rest being swingable from a horizontal coplanar position to a plurality of positions with the articulated parts bearing an angular relation to each other, and means for retaining said foot rest in said plurality of positions.

14. The structure claimed in claim 11 wherein said foot rest is swingable from a horizontal position to a plurality of raised positions with said first and second parts coplanar, and means for retaining said foot rest in said plurality of raised positions.

15. The structure claimed in claim 13 wherein the mattress for said foot rest has two articulated parts and in which the outermost articulated mattress part has heel-receiving depressions.

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2,880,783	4/59	Schwinn	5—90 X
2,932,831	4/60	Keathley et al.	5—91
3,038,174	6/62	Brown et al.	5—90 X

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