

April 25, 1933.

C. L. SHULTZ

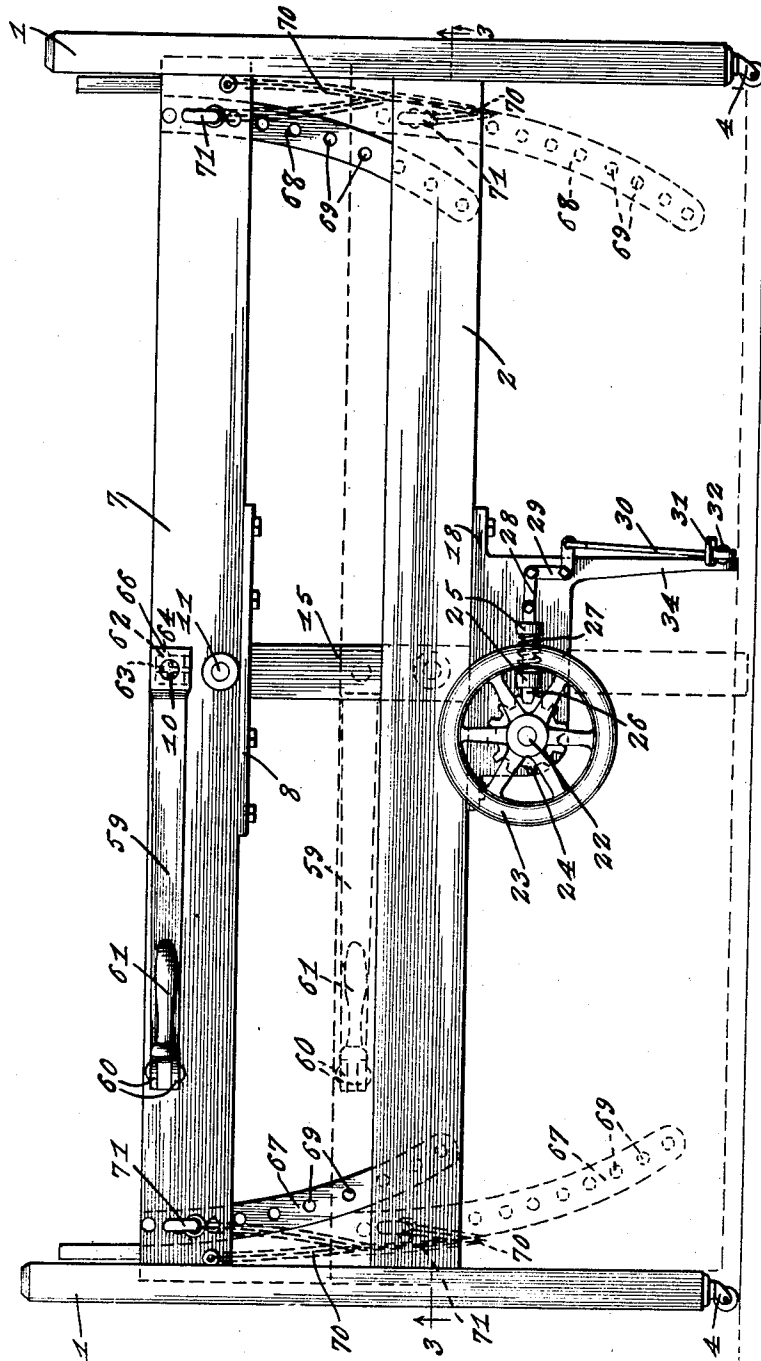
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HOSPITAL BED

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3 Sheets-Sheet 1

Fig. 1.



Charles L. Shultz, INVENTOR

BY Victor J. Evans
and Co. ATTORNEY

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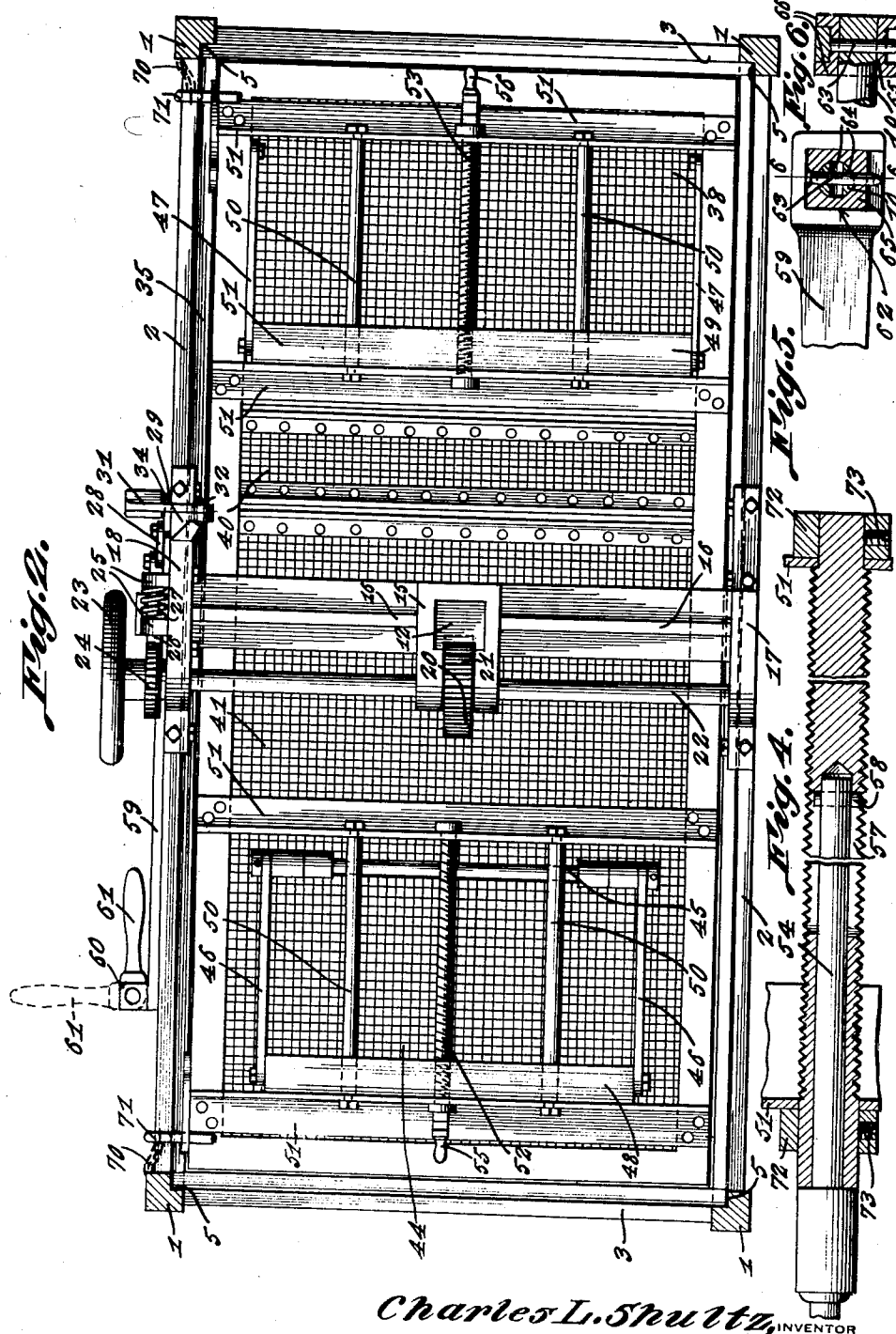
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Charles L. Shultz, INVENTOR

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and Co. ATTORNEY

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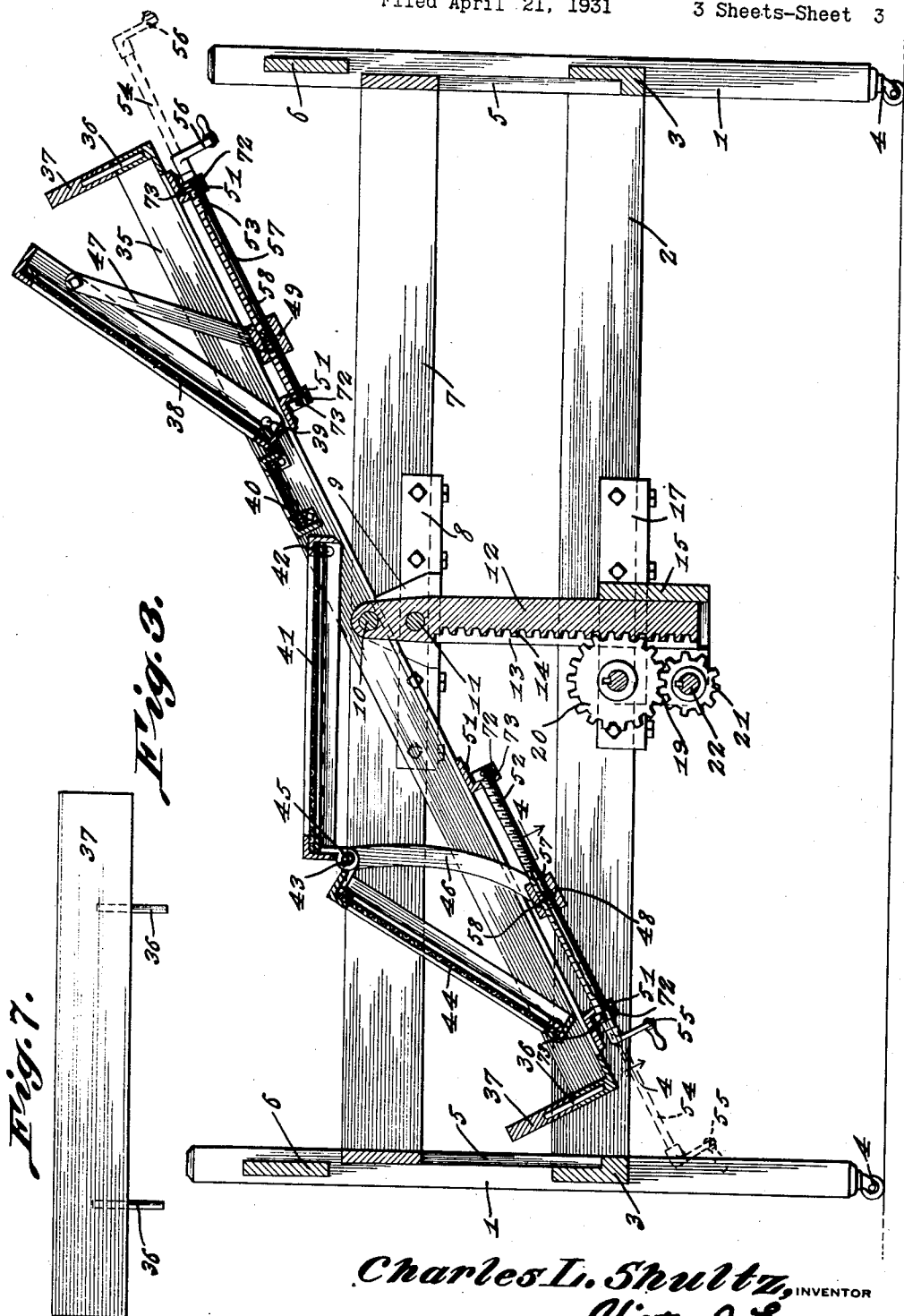
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Charles L. Shultz, INVENTOR

BY Victor J. Evans
and Co. ATTORNEY

UNITED STATES PATENT OFFICE

CHARLES L. SHULTZ, OF BROOKLINE, PENNSYLVANIA

HOSPITAL BED

Application filed April 21, 1931. Serial No. 531,808.

My present invention has reference to a new and novel construction of hospital beds.

The primary object of the invention is the provision of a bed construction for hospital use in which the bottom of the bed may be elevated or lowered to desired positions so that the patient can be conveniently arranged thereon when the bottom is lowered and when the bottom is elevated the patient will be arranged in a proper position for inspection by the nurse or by the physician and further wherein the frame of the bottom is pivotally supported and susceptible to tilting and being sustained at desired angles, the bottom proper being made up of pivotally and slidably supported sections, there being simple but novel means for adjusting the sections so that the patient may be supported thereon in a sitting or reclining position which will aid in the comfort of the patient and assist the physician in inspecting the patient.

The invention will be fully and comprehensively understood from a consideration of the following detailed description when read in connection with the accompanying drawings which form part of the application, with the understanding, however, that the improvement is capable of extended application and is not confined to the exact showing of the drawings nor to the precise construction described, and therefore, such changes and modifications may be made therefrom as do not affect the spirit of the invention nor exceed the scope thereof as expressed in the appended claims.

In the drawings:

Figure 1 is a side elevation of a hospital bed in accordance with this invention.

Figure 2 is an inverted bottom plan view thereof.

Figure 3 is an approximately central longitudinal sectional view through the bed showing the bottom frame tilted and the sections of the bottom arranged at different inclinations.

Figure 4 is an enlarged detail longitudinal sectional view approximately on the line 4—4 of Figure 3.

Figure 5 is a detail elevation, with parts in section to illustrate the manner in which the lever employed for tilting the bed is removably connected with the trunnion therefor.

Figure 6 is a sectional view approximately on the line 6—6 of Figure 5.

Figure 7 is a plan view of one of the detachable head or foot boards for the bed bottom frame.

The bedstead is of the usual construction, including the corner posts 1, the side rails 2 and the end rails 3. The posts 1 are mounted on caster wheels 4 whereby the bedstead may be rolled to desired positions in the room of a hospital. The corner posts in the present instance have their inner corners grooved longitudinally, as at 5, from points adjacent the lower edges of the end rails 3 and the head and foot boards 6, respectively of the bedstead. These vertically disposed grooves or channels provide guides for the corners of the substantially rectangular vertically adjusted frame 7 of the improvement.

The side rails of the frame 7 have fixed on their lower edges and on their sides centrally arranged channeled metal members 8 which have inner upstanding central ears 9. Journaled through the sides of the vertically adjustable frame 7 and through the ears 9 of the channeled members 8 there is a shaft 10, and below the shaft there is passed through the said ears 9, the channeled members 8 and sides of the frame 7, a spacer and connecting rod 11. The rod 11 has its outer ends headed or otherwise held on the sides of the frame 7 against longitudinal movement and the shaft 10 is also held by suitable means against longitudinal movement.

Both the shaft 10 and the rod 11 pass

through openings in the non-toothed upper end of a depending rack bar 12. Preferably, and as disclosed by the drawings, one of the faces of the bar 12 is grooved longitudinally, as at 13, and the rack teeth 14 are arranged in this groove. The lower end of the rack bar 12 passes through a guide opening in a block-like member 15, the said member being centrally formed on a transversely arranged channeled I beam 16. The I beam 16 has its ends provided with laterally extending channeled members 17 and 18, respectively. The channeled members receive therein and are secured to the lower edges as well as the opposite faces of the side rails 2 of the bedstead. The guide block 15 has a central slotted or cut-away portion that communicates with the guide opening therein, and there is arranged and journaled in the said cut-away portion 19 a toothed wheel 20 which is in mesh with the teeth 14 of the rack bar 12. The toothed wheel 20 is in mesh with a pinion 21 that is fixed on a shaft 22 which is also journaled through the slotted portion of the guide block 15 and which pinion is arranged below the toothed wheel 20. The shaft 22 has one of its ends bearing in the channeled member 17 and its second end is passed through a bearing opening in the channeled member 18. The extending end of the shaft has fixed on its outer portion a hand wheel 23 and the said shaft, inward of the hand wheel has fixed thereon a ratchet or toothed wheel 24. The bracket member 18 is not necessarily channeled and may be secured directly to the lower edge of the rail 2 as disclosed by the drawings. On the outer face of this member 18 there is movable through bearings 25 a dog 26 designed to be received between the teeth of the wheel 24, the said dog being influenced in such direction by a spring 27. The outer end of the dog has pivotally secured thereto a link 28 which in turn is pivotally connected to a bell crank lever 29. The outer arm of the bell crank lever has loosely fixed thereto a depending rod 30 and this rod is connected to the offset end of a foot pedal 31. The pedal is pivoted, as at 32, to an element 34 that depends from one corner of the member 18.

As far as the description has progressed it will be noted that an attendant placing his foot on the pedal 31 releases the dog 26 from engagement with the toothed wheel 24. This permits the shaft 22 being turned by the operation of the hand wheel 23, and through the instrumentality of the toothed wheel 20 the rack 12 can be either raised or lowered. The frame 7 can thus be easily raised and lowered and be sustained at any desired elevation on the bedstead. The frame 7 and the bed bottom (hereinafter described) are in raised position when a patient is moved on a wheeled stretcher from

the operating table to the bed, as the wheeled stretcher is of a height approximately equaling the level of the frame 7 when in said raised position. When the bed is in elevated or normal position (a position at which the ordinary hospital bed is arranged), the patient can be conveniently inspected by the nurse or physician without necessitating the undue bending of the nurse or the physician. By lowering the bed the patient can be conveniently removed therefrom or returned to the bed.

The vertically adjustable frame 7 has arranged therein the frame that supports the bottom of the bed. This supporting frame 35 is centrally and swingably supported on the shaft 10. The bed bottom supporting frame is preferably constructed of angle irons and has its upper ends at its head or foot provided with openings in which are received dowel pins 36 that depend from the lower edge of removable foot and head plates 37, respectively.

The bed bottom is made up of sections, each comprising a substantially rectangular angle frame in which is fixed the mesh or springs upon which the mattress rests. The bed bottom section nearest the head of the bottom supporting frame 35 is indicated for distinction by the numeral 38 and the sides thereof, adjacent their lower and inner corners, are pivoted, as at 39, to the sides of the frame 35. Next there is a short bottom frame section 40 which is fixedly secured to the sides of the bottom supporting frame 35. Adjacent the bottom frame section 40 there is another section 41 of a size approximately equaling that of the section 38, and this section 41 is pivoted to the sides of the bottom supporting frame 35 adjacent to the fixed bottom frame section 40, as at 42. The outer end of the bottom frame section 41 has a hinged connection 43 with the remaining bottom frame section 44 of the improvement. The pintle which connects the rounded interengaging barrel portions of the hinge 43 is indicated by the numeral 45 and has pivotally secured thereto a pair of arched depending links 46. A pair of straight links 47 is pivotally secured to the sides of the bottom frame section 38. The lower ends of the respective pairs of links 46 and 47 are pivotally secured to the ends of follower members 48 and 49, respectively. The follower members are in the nature of substantially rectangular members and each of the said members is mounted for longitudinal movement along rods 50, respectively, whose ends are fixed to the depending flanges of spaced pairs of angle plates 51, respectively. The follower members, of course, are provided with suitable openings for the guide rods 50 and the guide rods have their ends suitably fixed on the members 51. The angle members

51 have their ends secured to the under face of the sides of the bed bottom supporting frame 35, and materially reinforce and strengthen this frame. Having their non-threaded ends journaled in bearing openings in the respective pairs of angle plates 51 there are screw shafts 52 and 53, respectively. The screw shafts have oppositely hand pitched threads and pass through threaded openings in the follower members 48 and 49. Each screw shaft 52 and 53, from its outer end, is provided with a round bore that extends therefrom for a suitable distance and in these bores there are received the cross sectionally round rods or shanks 54 that extend from crank handles 55 and 56, respectively. Each screw shaft has a longitudinal opening 57 therethrough that communicates with its bore, and each shank 54 has passed therethrough a pin 58 to contact with the opposite walls provided by such openings. This permits of the crank handles 55 and 56 being drawn outwardly through the bores of the respective screw shafts 52 and 53 to arrange the crank handles in position for convenient operation. The turning of the handles will, of course, impart a like turning to the screw shafts, and such turning of the shafts will cause the follower members to be moved longitudinally along the shafts. This movement of the follower members will swing the links 46 or 47 so that the pivotally supported and hinged bed bottom sections may be arranged at desired angles, as disclosed by Figure 3 of the drawings, the angular arrangement of these parts being made to best suit the comfort of the occupant of the bed. The parts may be adjusted when the bed bottom supporting frame 35 is in horizontal position or is in an angular position, as disclosed by Figure 3 of the drawings.

To swing the bed bottom supporting frame 35 to different angular positions I employ a lever 59 that has on one of its ends ears 60 between which there is pivoted a handle 61. The handle may be swung outwardly between the ears when the lever is required for use or against the lever when the same is not required for use. The second end of the lever 59 has a substantially rectangular notch 62 entering from one of its edges and depending from the inner wall of the notch there is a pin 63. The outer projecting end of the shaft 10 is provided with intersecting right angularly arranged openings 64, respectively, and this end of the shaft has mounted thereon a block 65 provided with an opening designed to register with one of the openings 64, and the said block has side flanges 66. The body of the block is square in cross section and the lever may have its notched end 62 received along the sides or top and bottom

walls of the block so that the pin can pass through the opening in the block and be received through either of the openings 64 in the shaft 10, which permits of the lever being operated from either a horizontal or vertical position. The shaft 10, of course, is fixedly secured to the sides of the bottom frame 35, and the turning of the lever will consequently swing the frame to the desired angles heretofore mentioned.

In order to hold the bottom supporting frame 35 either longitudinally in the vertically adjustable frame 7 or at angles thereto, one side of the frame 35, adjacent to the ends thereof, has pivotally connected thereto depending metal straps 67 and 68, respectively, each of the said straps being provided with a series of spaced and longitudinally arranged apertures 69, respectively. Supported from eyes on the corner posts of the bedstead, adjacent to the straps 67 and 68, there are chains or like flexible elements 70, respectively, that carry at their outer ends pins 71, respectively, and these pins are insertible through any of the openings 69 in the respective straps 67 and 68 and through openings in the sides of the vertically adjustable frame 7, and whereby the frame 35 is effectively held from movement when in horizontal or in angular positions. I have stated that the screw shafts have reduced ends which are received through the angle members 51, but this is not necessarily true as the non-threaded ends of the said shafts may be held from movement through their bearing openings by stop elements in the nature of collars 72 which are fixed on the shafts by binding elements 73, the said collars contacting with the outer faces of the respective pairs of the angle members 51.

It is believed the foregoing description, when carefully read in connection with the accompanying drawings, will fully and clearly set forth the construction and advantages of my improved hospital bed to those skilled in the art to which such invention relates so that further detailed description will not be required.

Having described the invention, I claim:

1. A hospital bed including a bedstead having its posts grooved longitudinally, a frame having its corners guided in the grooves, a sectional bottom pivotally supported in the frame, means for raising or lowering the frame, means for holding the frame raised or lowered, means for swinging the bottom in the frame, means holding the bottom when thus swung and means for swinging and sustaining the bottom sections in angular relation with respect to each other or in alinement.

2. A hospital bed having its corner posts grooved longitudinally, a frame having its corners received in the grooves, means for

raising or lowering the frame, means for holding the frame in its raised or lowered positions, a bottom supporting frame centrally pivoted to the movable frame and having a bottom made up of hingedly connected sections therein, means for swinging the bottom supporting frame to arrange the same at inclinations, means for holding the bottom supporting frame when thus swung and for likewise holding the frame in normal horizontal position, and means for tilting and for sustaining the bottom sections angularly with respect to each other or in alinement.

3. A hospital bed having its corner posts grooved longitudinally, a movable frame having its corners received in the grooves, means for vertically adjusting the frame in the bedstead, means holding the frame adjusted, a bottom supporting frame which is centrally pivoted in the movable frame, lever operated means for swinging the bottom supporting frame on its pivots, means for holding the bottom supporting frame when swung and when in horizontal position, a bottom made up of a fixed section and swingable sections, arranged in the bottom supporting frame and supported thereby, two of such sections being pivotally connected together, and one of said pivoted sections having its free ends slidable upon the bottom supporting frame and means for swinging the pivoted bottom sections to angular positions and for sustaining the said sections at such angles and for likewise sustaining the sections in alinement.

4. A hospital bed including a bedstead, a vertically adjustable frame slidably mounted in the bedstead, means for raising or lowering the frame, means for holding the frame when raised or lowered, a bottom supporting frame, centrally pivoted in the vertically adjustable frame, means for swinging and sustaining the bottom supporting frame at angles with respect to the vertically adjustable frame, a bottom in the bottom supporting frame, said bottom comprising hingedly connected sections, means for tilting said bottom sections with respect to the bottom supporting frame and with respect to each other, and means for holding the bottom sections in such angular position.

5. A hospital bed including a bedstead having newel posts which are provided with longitudinal grooves, on their confronting corners, a frame having its corners received in the grooves, means for vertically adjusting and sustaining the frame on the bedstead, a bed bottom supporting frame centrally pivoted to the sides of the vertically adjustable frame, means for swinging and holding the bed bottom supporting frame at angles with respect to the vertically adjustable frame, a bed bottom in the bed bottom supporting frame, said bed bottom being

made up of sections pivotally supported in the bed bottom frame, means for tilting the bottom sections with respect to each other and for holding the same in such angular relations and said means being also operated to bring the sections to aline with each other and to arrange the same at such alinement in the bed bottom supporting frame.

In testimony whereof I affix my signature.
CHARLES L. SHULTZ.