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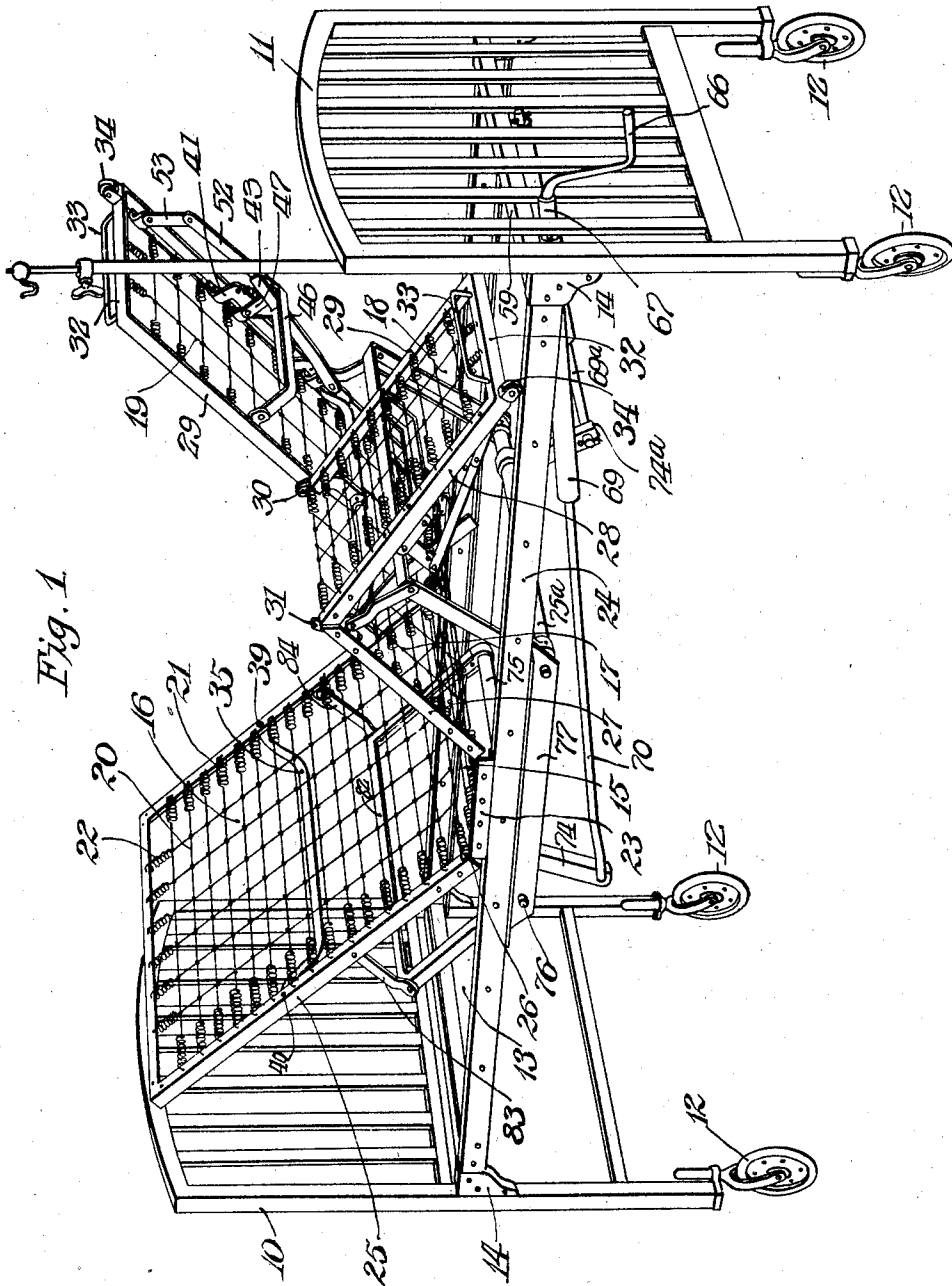
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1,775,547

HOSPITAL BEDSTEAD

Filed April 17, 1922

4 Sheets-Sheet 1



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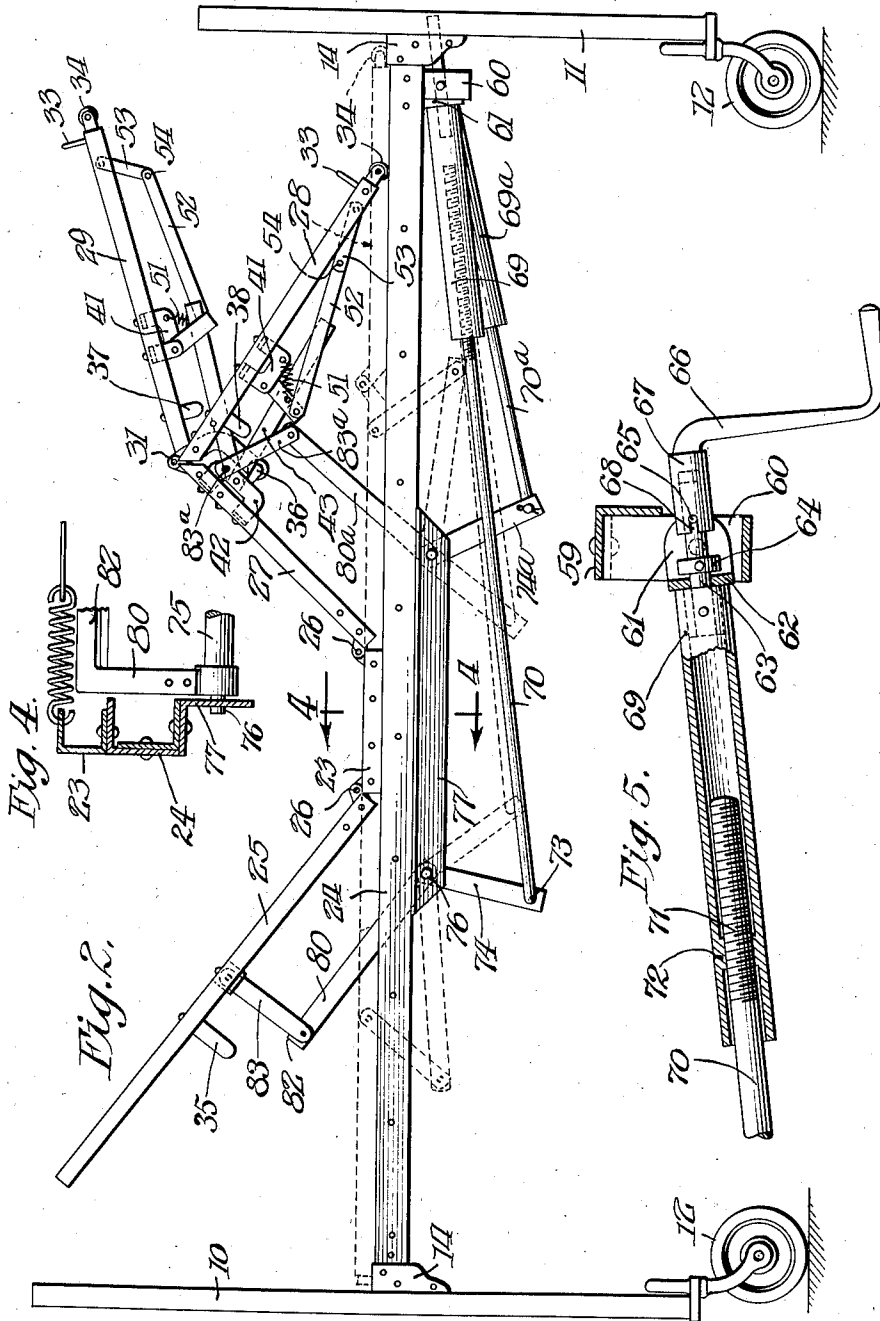
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HOSPITAL BEDSTEAD

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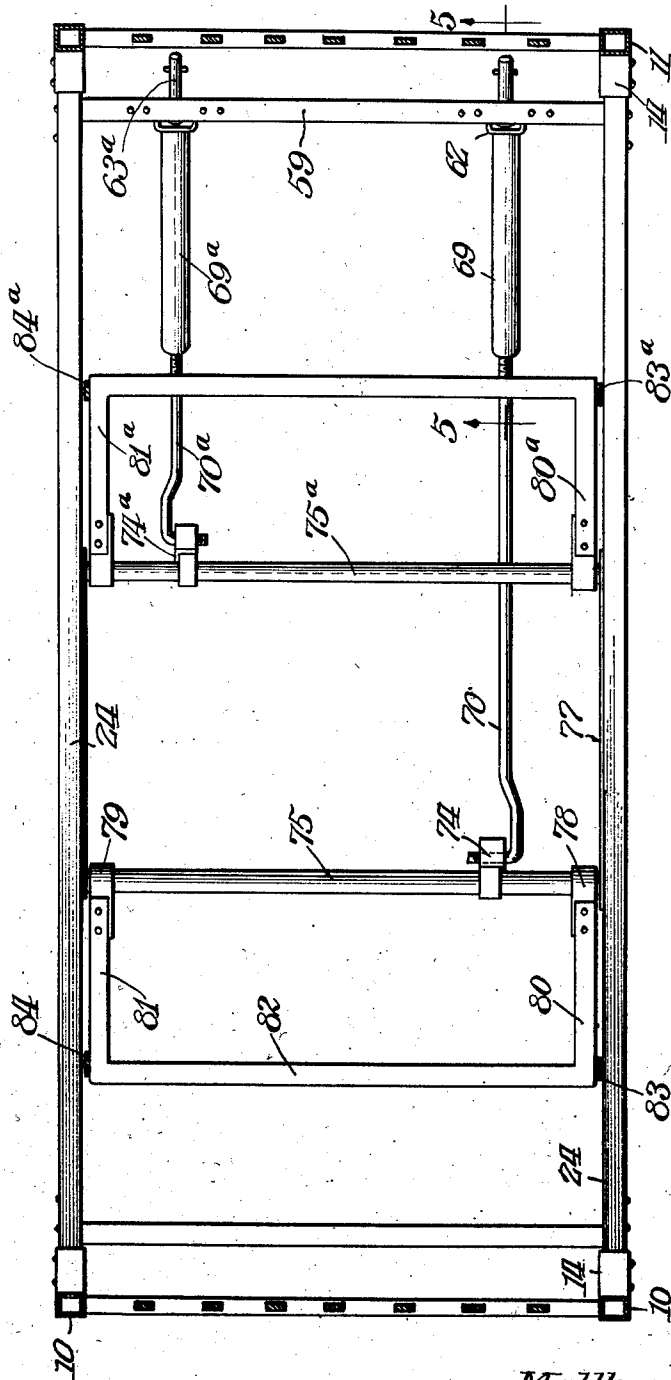
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Fig. 3.



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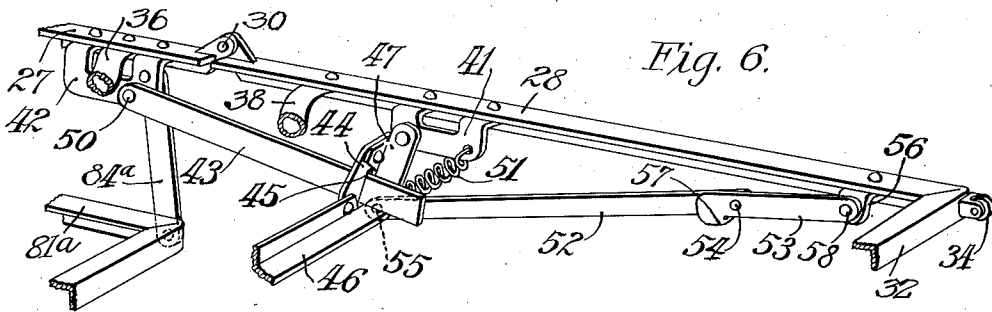


Fig. 6.

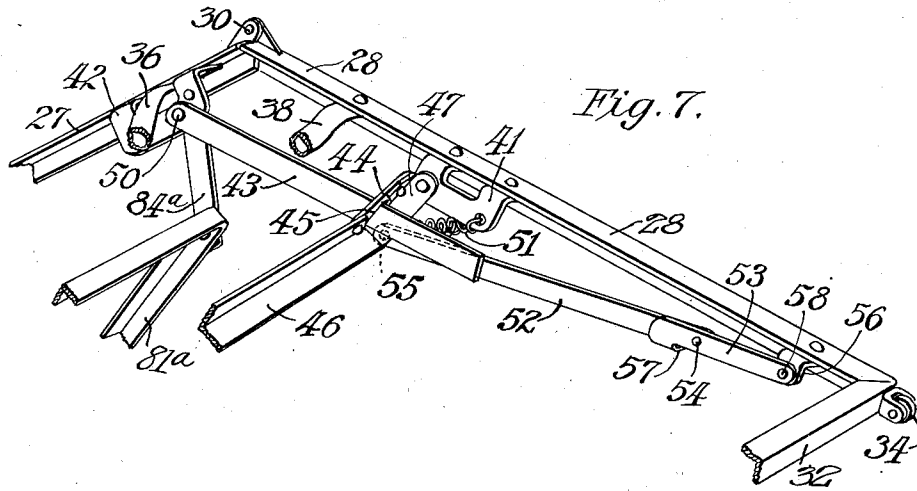


Fig. 7.

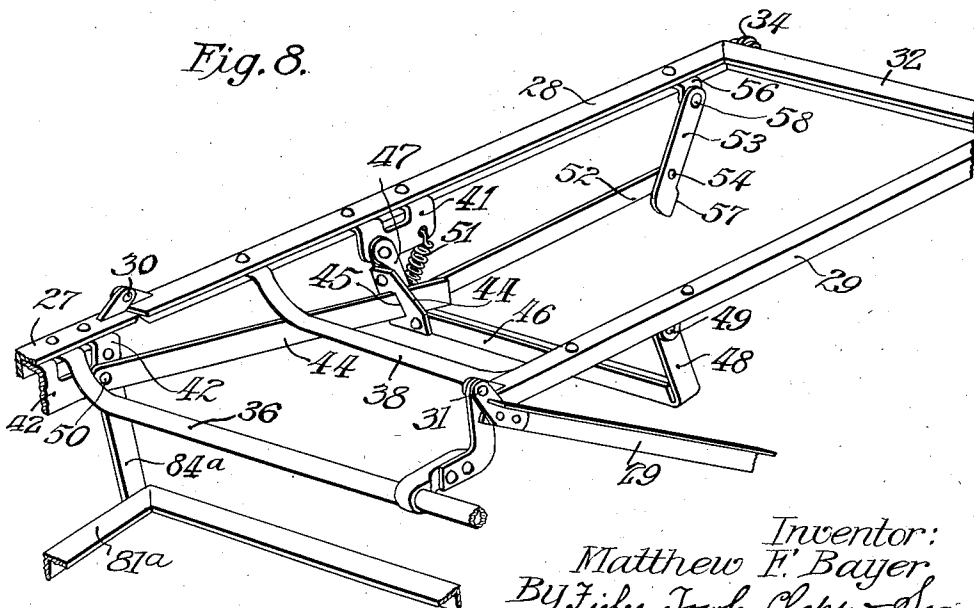


Fig. 8.

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UNITED STATES PATENT OFFICE

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HOSPITAL BEDSTEAD

Application filed April 17, 1922. Serial No. 554,102.

My invention relates to improvements in hospital bedsteads, and has particular reference to a type of bedstead which may be adjusted to promote the comfort of the occupant.

The principal objects of the invention are, to provide a bedstead having a supporting surface formed of a plurality of sections which may be readily and conveniently tilted relative to each other; to provide an improved construction so organized that the respective feet or lower limbs of the occupant may be disposed in positions to suit the comfort requirements of each limb or foot independently of the other; to provide an improved arrangement whereby the relatively tiltable sections may be locked against such tilting movement; to provide a construction so arranged that the adjustment of the various sections may be performed rapidly and with a minimum of effort on the part of the operator or discomfort on the part of the occupant of the bed; to provide a construction of the class described which shall be simple in design and economical to manufacture and, in general to provide an improved and efficient arrangement of the character referred to.

In the drawings which illustrate my invention as applied to an invalid bedstead,

Fig. 1 is a perspective view of said bedstead, showing the various sections of the supporting surface differently inclined with respect to each other.

Fig. 2 is a side elevation of the bedstead shown in Fig. 1.

Fig. 3 is a plan view showing the main elements of the supporting frame and elevating mechanism.

Fig. 4 is a section taken on the line 4—4 of Fig. 2.

Fig. 5 is a section taken on the line 5—5 of Fig. 3.

Fig. 6 is a perspective view of a portion of the mechanism controlling tilting of one of the leg sections.

Fig. 7 is a perspective view of the parts shown in Fig. 6 but occupying a different position, and

Fig. 8 is a perspective view of one of the

leg section frames the mechanism being in the same position as shown in Fig. 6, but viewed from a different angle.

Referring to the drawings, 10 and 11 respectively represent the head and foot end frames of an ordinary bedstead, the corner posts of which are equipped with suitable large diameter free rolling casters, as at 12. The head and foot ends 10 and 11 are connected together by and support the ends of a rectangular frame 13, said frame being preferably detachably united to the head and foot ends 10 and 11 by suitable corner connections 14. The rectangular supporting frame 13 constitutes a support for the sectional bed bottom.

As shown in the drawings, the bed bottom is composed of a central or stationary portion 15, a tiltable back rest portion 16, a thigh supporting portion 17, also tiltable with reference to the stationary section 15 and a pair of foot or leg supporting sections 18 and 19 independently tiltable with reference to section 17. The supporting surface of the bed bottom comprises a link fabric preferably composed of a series of transversely extending chains 20 stretched and connected between the side frame members of the bed-bottom sections by means of helicals 21. Said transversely extending chains 20 may be connected together longitudinally of the length of the bedstead by means of suitable cross links which themselves are connected to the end cross members of the bed bottom by helicals as at 22.

The central or stationary portion of the supporting fabric is stretched between a pair of relatively short angle iron side bars 23 which are secured by any suitable means such as rivets to the top flanges of the angle irons 24 which constitute side rails of the main rectangular supporting frame. To the head end extremities of the angle iron members 23 there are pivoted the side members 25, of U-shaped form, across which the back rest portion of the fabric is stretched. The pivot joints 26 are preferably arranged so that their axis coincides substantially with the surface of the bed bottom supporting surface so that the mattress will bend freely with the

frame when the back rest is elevated. So locating the axis also prevents relative displacement of the adjacent edges of the adjacent relatively tiltable sections. The position of the pivotal axis of each of the other sections of the bed fabric is also located in this manner and for the same reason.

To the foot end extremities of the stationary side members 23 there are pivoted angle members 27 which constitute the side frames of the thigh supporting section 17. To the foot end extremities of the said side members 27 there are pivotally connected angle irons 28 which constitute the outside side frames of the independent leg supporting sections 18 and 19. The inner side frames 29 of the leg supporting sections 18 and 19 are pivoted together as at 30, the axis of said pivot coinciding with the axes of pivots 31 which pivotally connect angle bars 27 and 28. The side frames 28 and 29 of the leg supporting sections 18 and 19 are preferably united together at their foot end extremities by transverse angle irons 32, said end members 32 being preferably equipped with bails 33 for facilitating adjustment of the respective leg sections. If desired, rollers 34 may be mounted on the ends of the side members 28 so that the said ends will slide freely on the upper surfaces of the side rails 24 when the bedstead sections are being adjusted.

In order to prevent the pull of the helicals from collapsing or drawing toward each other the various side members of the supporting sections, I prefer to employ stretcher bars as at 35, 36, 37 and 38. Said stretcher bars in the present instance take the form of stout tubes having their ends flattened and riveted to the flanges of the side members as indicated at 39, the central or intermediate portions of said stretcher bars being offset below the fabric as indicated at 40 so that they will not interfere with the resiliency of the bed bottom supporting surface.

The foot supporting sections 18 and 19 may be adjusted independently of each other and maintained in such adjusted position by the following mechanism.

Referring particularly to Figs. 6, 7 and 8, it will be seen that on the outer side bar 28 of each foot section, there is riveted a bracket 41 and to the side bar 27 there is riveted a somewhat similar bracket 42, said brackets 41 and 42 being in substantial alignment. To the said brackets 42 and 41, there are respectively pivoted a cramp rod 43 and a cooperating swinging guide member 44. The cramping rod 43 takes the form of a straight bar of rectangular cross section, and the cramping guide 44 comprises a plate slotted as at 45 to slidably receive the bar 43, said plate being riveted to the swinging bail member 46, which extends across and below the supporting surface of the foot section. Said

bail 46 takes the form, in the present instance, of a length of angle iron having the ends bent at right angles as shown at 47 and 48 to pivotally connect with the bracket 41 and a pivot 49 on the opposite side bar 29 of the foot section.

A force tending constantly to swing the bail 46 away from the pivotal connection 50 of the cramping rod 43 is applied by means of a coiled tension spring 51 connected between the outer end of the bracket 41 and the lower or outer end of the arm 47 whereby, when said spring 51 is permitted to swing said bail, the rod 43 will be cramped in the slot 45 of member 44 and thereby prevent further swinging movement of the cramping guide 44, and thus also prevent relative tilting or swinging movement of the foot section and the thigh supporting section.

Means are provided to resist the tendency of spring 51 to swing the cramp guide 44 into cramping engagement with rod 43 so that, when desired, either of the foot supporting sections may be swung or tilted relative to the thigh supporting section 17. Said means comprises a breakable toggle strut consisting of a pair of links 52 and 53 pivotally connected together at 54 and having their other ends respectively pivotally connected to the bail as indicated at 55 and to a small bracket 56 riveted to the side bar 28. When it is desired to utilize the cramping action of bar 43 and guide 44, to prevent relative pivotal movement of one of the foot supporting sections 18 and 19 and the thigh supporting section 17, the toggle strut is allowed to assume the broken position indicated in Fig. 8. In order to render such cramping mechanism inoperative, the toggle links 52 and 53 are manually brought up into the position indicated in Figs. 6 and 7 so that they will be in alignment and in such position, the bar 43 is enabled to slide freely through the cramping guide 44 without cramping action. Preferably, for the purpose of permanently throwing out of action the cramping members, the inner end of the toggle link 53 is extended past the pivot 54 and provided with an integral lug 57 bent so as to extend under the lower edge of the link 52 so that when the pivot 54 is raised slightly above a line extending through pivots 55 and 58, said lug 57 will prevent further movement of the pivot 54 upwardly and will thus maintain the strut effect of the toggle links.

The foot supporting sections 18 and 19, each of which is equipped with mechanism such as I have above described in connection with the foot supporting section 19, are elevated and depressed manually by the nurse or other operator when standing at the side of the bedstead. Since the weight of the load on each foot supporting section is comparatively slight, the nurse can readily lift or control same with one hand by the bail 33, the

other hand serving to control the toggle link 52. However, since the weight of the back rest portion 20 and its load, and the weight of the thigh supporting section 17 and its load, are considerable, I prefer to employ special mechanism for effecting raising or lowering movements of such parts, such mechanism, which will now be described, being a valuable feature of my improved bedstead.

Referring to Figs. 2, 3 and 5, it will be seen that to the end cross member 59 of the supporting frame, there are riveted a pair of U-shaped hangers 60, and within each of said hangers there is pivotally mounted on a horizontal axis a U-shaped strap metal bearing member 61. In the yoke 62 of said bearing member 61, there is punched a bearing aperture for rotatably receiving a shaft 63. On the outside end of said shaft 63 there is pinned a positioning collar 64 and also in the outer end of said shaft 63 there is fixed a pin 65 extending diametrically through said shaft with its ends projecting outwardly therefrom, said pin 65 serving as a turning connection for the detachable hand crank 66, which is made with a socket 67 bored out to receive the end of shaft 63 and having slot 68 for receiving the ends of said pin 65.

The inner end of said shaft 63 is pinned in the end of a sleeve or tube 69, said tube constituting a barrel or casing for the threaded end of a rod 70. The threads 71 on the end of said rod 70 cooperate with a nut member 72 located within the barrel or sleeve 69 a short distance from the end thereof and constituting an integral part of said sleeve.

The end of said rod 70 remote from threads 71 is bent or offset as indicated at 73 to form a pivotal connection with a suitable aperture in the lower end of a rock arm 74. Said rock arm 74 is preferably made with a hub rigidly keyed to a tubular shaft member 75 extending transversely across the bedstead and having its axis horizontal and disposed at such distance below the supporting surface of the bedstead so as not to interfere with the resiliency of the fabric. Said tubular shaft 75 is journaled on a pivot rod or tie rod 76 extending through a pair of angle members 77, riveted to the under sides of the side rails 24. To the ends of the rock shaft 75 there are keyed a pair of hubs 78 and 79, to which hubs there are riveted the arms 80 and 81, the outer ends of said arms being connected by a tie bar or bail 82. The outer ends of said arms 80 and 81 are also connected by means of relatively short links 83 and 84 with the side members 25 of the back rest section 20, the point of connection to the said side members 25 being at a substantial distance from the pivot 26.

It will be manifest that when the nurse or operator desires to raise the back rest 16 into the position shown in Fig. 1, or to lower same from the position shown in Fig. 1 to the

dotted line position shown in Fig. 2, the crank may be applied to the end of shaft 63 in the manner indicated in Figs. 1 and 5, thus enabling nut 72 to be turned with sleeve 69 and causing longitudinal movement of the connecting rod 70. Movement of connecting rod 70 will swing rock arm 74 and with it shaft 75 thus rocking arms 80 and 81 and through links 83 and 84 causing tilting or swinging movement of back rest section 16. By turning crank 66 in the proper direction, the back rest section 16 may be tilted or swung in either direction until it is adjusted at the precise angle necessary for maximum comfort or to suit the requirements of the case.

Similar mechanism is employed for the purpose of effecting tilting movement of the thigh supporting section 17, such mechanism comprising a similar shaft 63^a, sleeves 69^a connecting rod 70^a, rock arm 74^a, tubular rock shaft 75^a and arms 80^a and 81^a having at their at their outer ends links 83^a and 84^a. Said last named links have their outer ends pivotally connected to the brackets 42, previously referred to, whereby on rotating shaft 63^a, by the detachable crank, the pivotal point 31 may be elevated or depressed, thereby effecting the desired adjustment of the thigh supporting section.

The details of construction and operation being illustrative of merely a single phase of my invention, the scope of same should be determined by reference to the appended claims, said claims being construed as broadly as possible, consistent with the state of the art.

I claim as my invention:

1. In a bedstead, the combination of a main frame, a bed bottom supported by said frame and provided with relatively tiltable sections, a rod pivotally connected to one of said sections and extending toward the other section, a guide member pivotally mounted on said last named section and adapted to slidably receive said rod at a distance from its pivot whereby, when said sections are subjected to force tending to tilt same relatively in one direction, the guide will crampingly engage said rod and prevent such tilt while, when said sections are swung in the other direction, the rod will slide through said guide and permit such movement, means constantly tending to swing said guide member on its pivot in a direction to promote said cramping effect, and a member adjustable into position to oppose said last named means.

2. In a bedstead, the combination of a main frame, a bed bottom supported by said frame and provided with relatively tiltable sections, a rod pivotally connected to one of said sections at a point spaced from the tilting axis, said rod extending toward the other section, a guide member pivotally mounted on said last named section at a point spaced from the tilting axis and adapted to slidably re-

ceive said rod at a substantial distance from
its pivot, swinging movement of said guide
member being limited in one direction, where-
by, when said sections are subjected to force
5 tending to tilt same relatively in one direc-
tion, the guide will crampingly engage said
rod and prevent such tilt, while, when an op-
positely acting force is applied, the rod will
slide through said guide and permit tilting in
10 the other direction, means constantly tending
to swing said guide member on its pivot in a
direction to promote such cramping effect,
and a member manually adjustable for main-
taining said guide member in inoperative or
15 non-cramping position.

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