

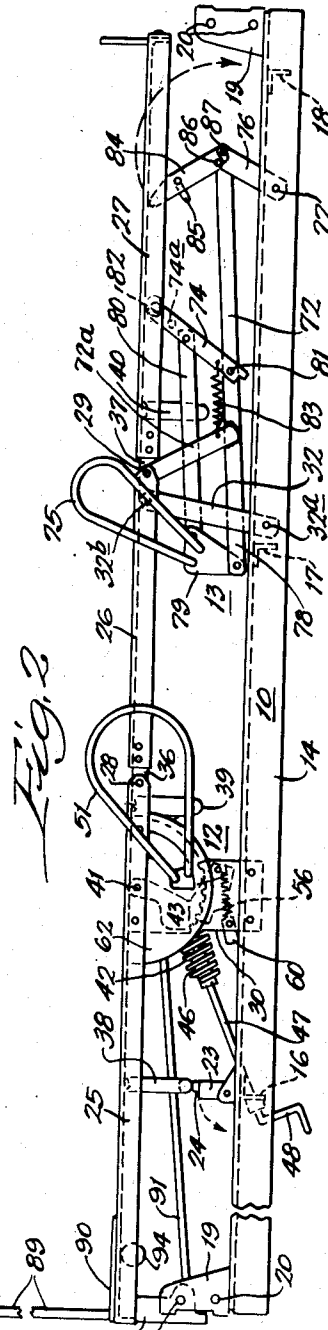
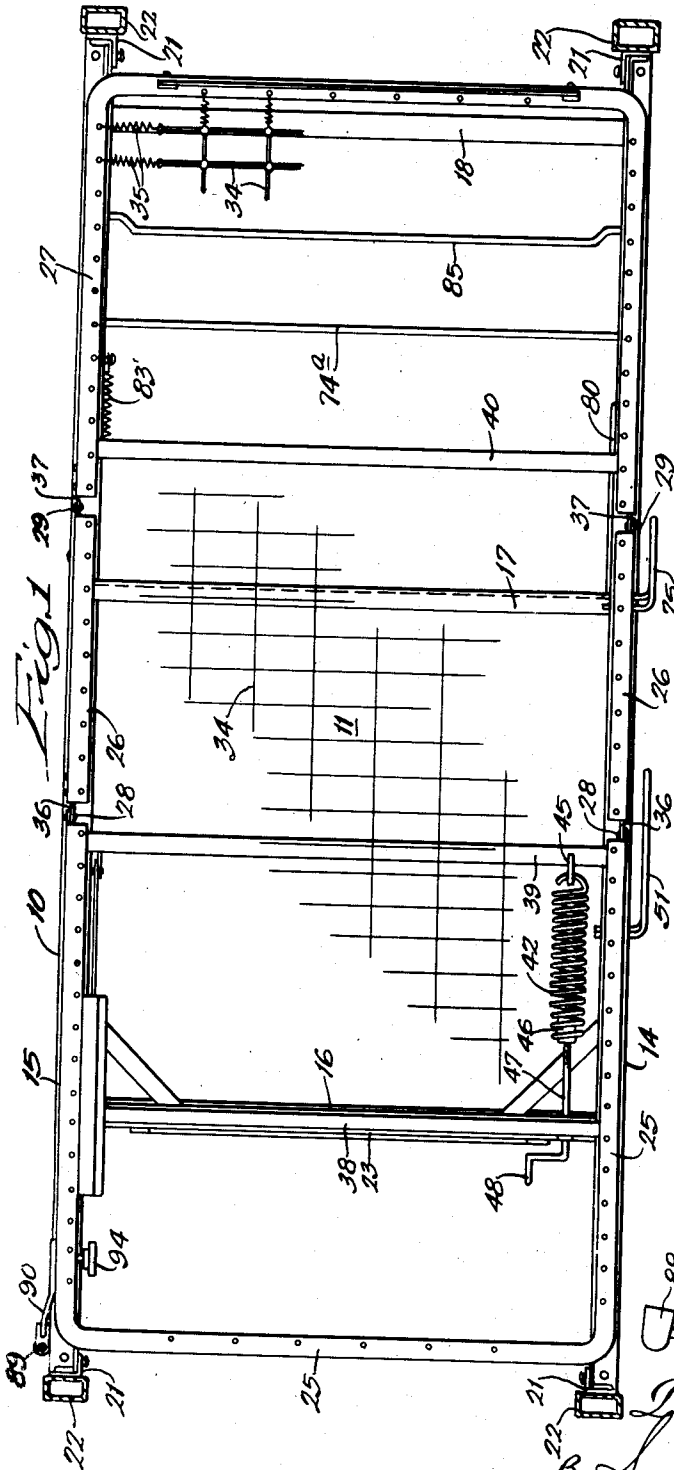
Nov. 10, 1953

D. C. TRAVIS
SELF-TILTING BED

2,658,209

Filed April 16, 1947

4 Sheets-Sheet 1



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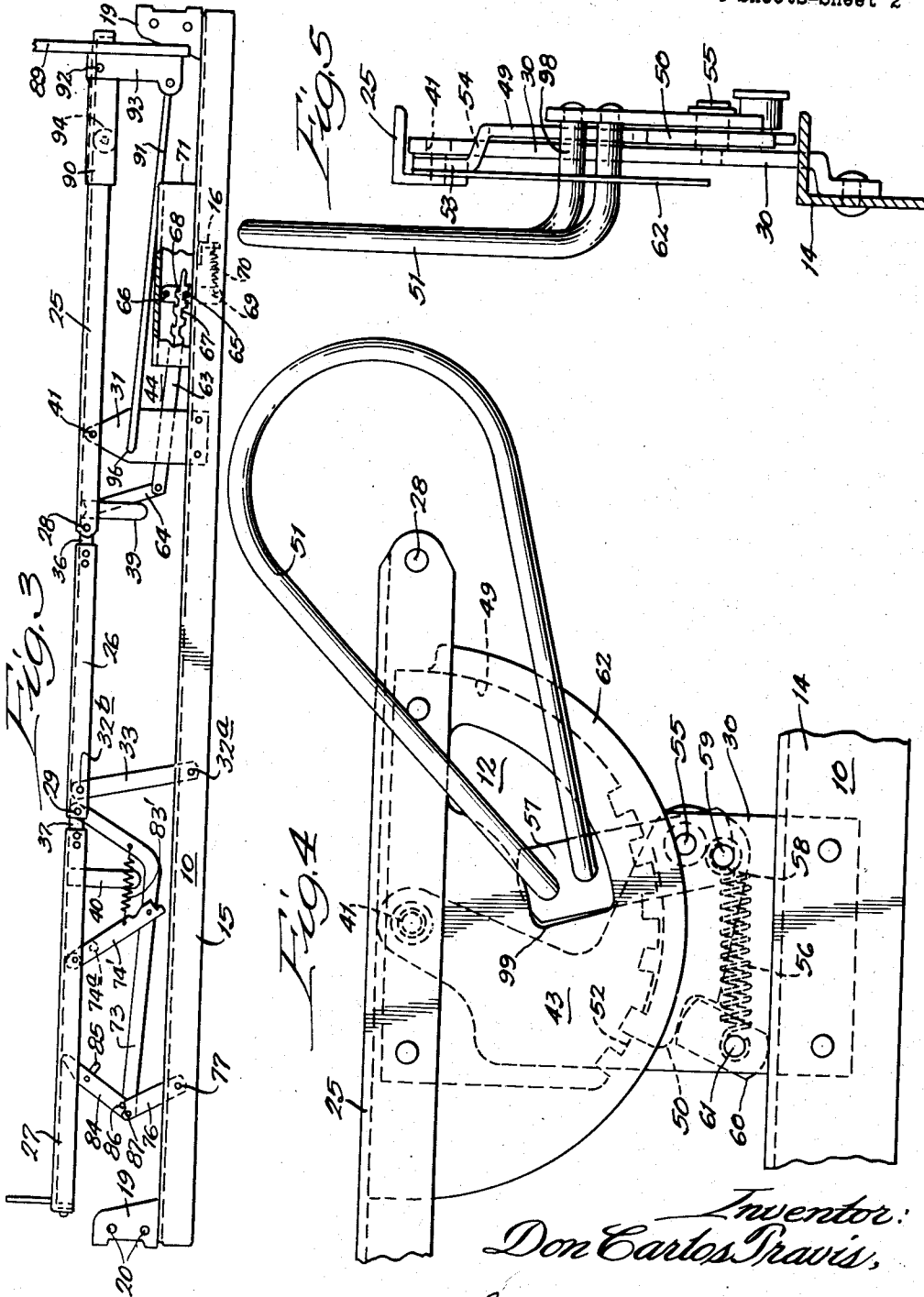
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4 Sheets-Sheet 2



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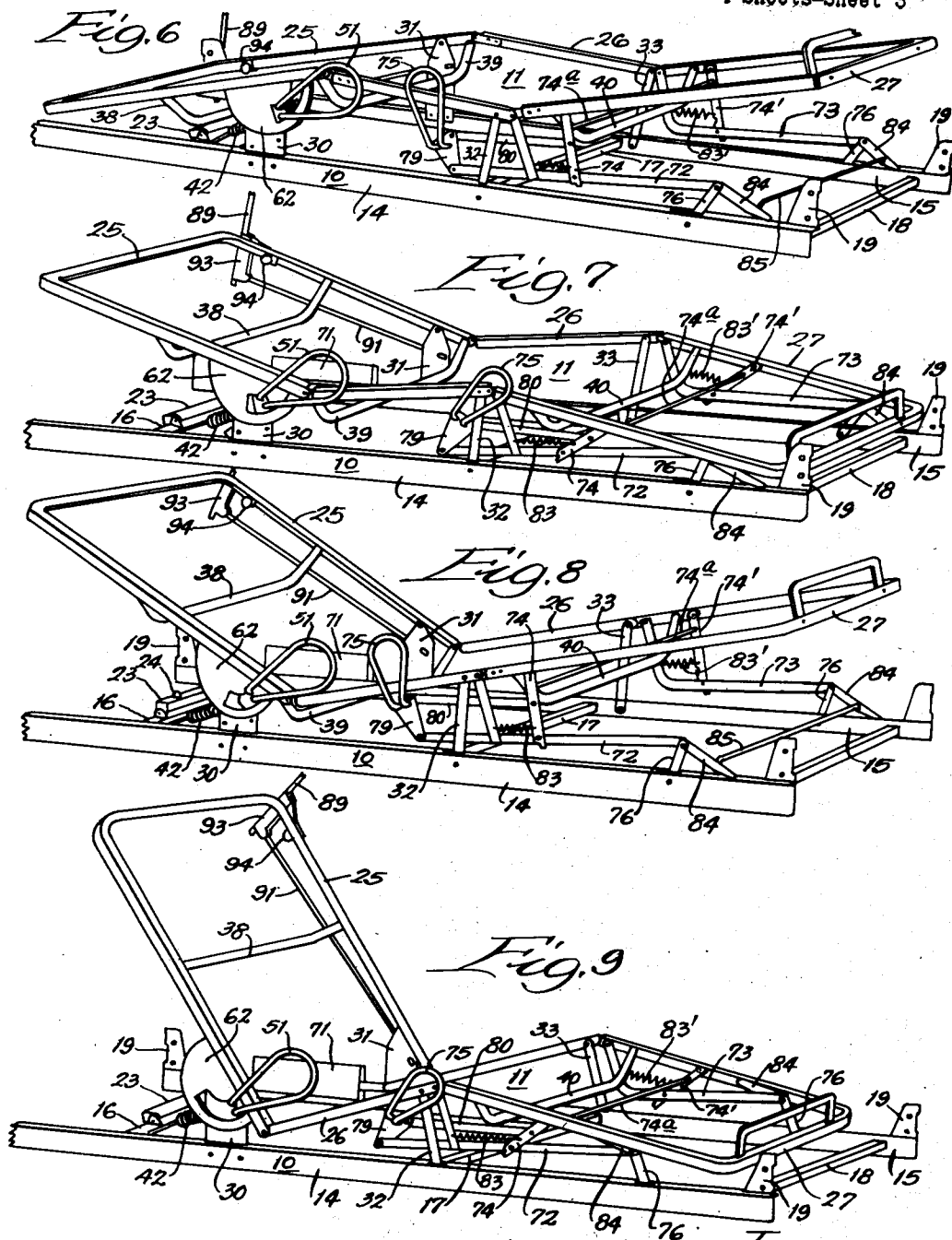
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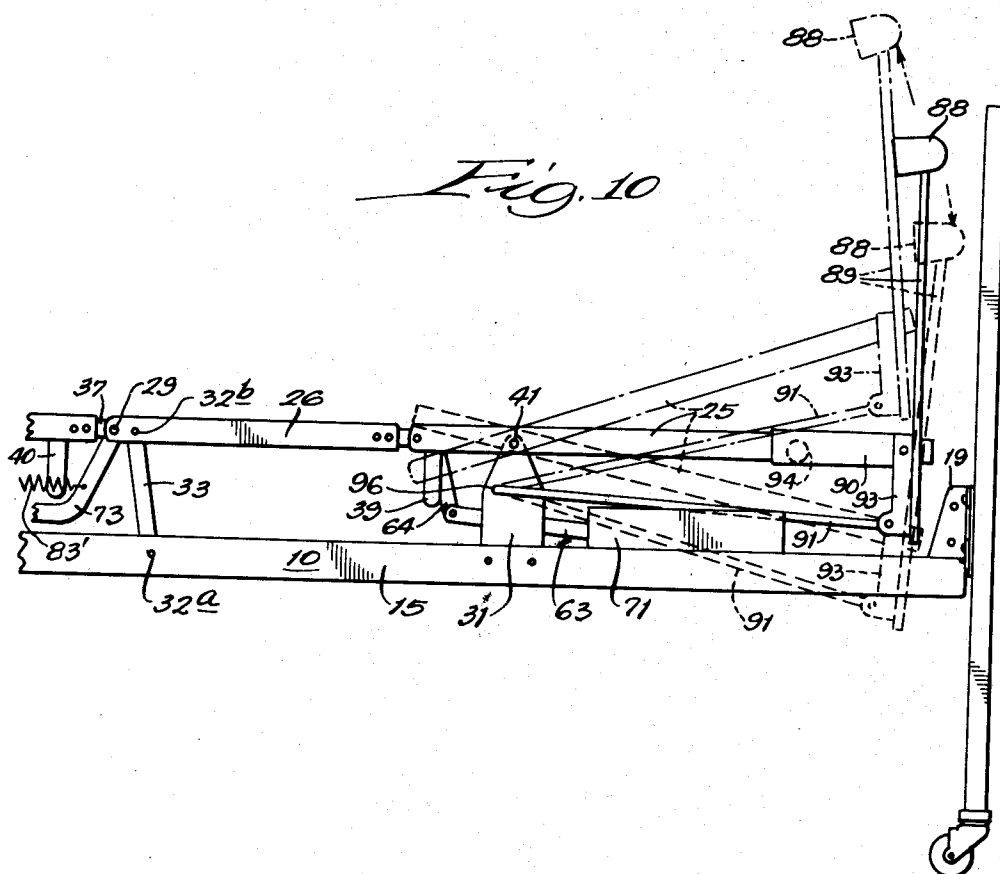


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SELF-TILTING BED

4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,658,209

SELF-TILTING BED

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15 Claims. (Cl. 5—66)

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This invention relates to a bed of the type wherein the bed bottom comprises a plurality of hinged sections adjustable on the supporting frame to occupy varying non-horizontal annular positions.

The main objects of this invention are, to provide a bed of this kind with improved means for mounting the several bed-bottom sections on a supporting frame so as to permit their shifting from aligned horizontal positions into various non-horizontal angular positions, and vice versa; to provide improved means normally tending to dispose said bed bottom sections to occupy non-horizontal angular positions; to provide such an improved arrangement and relationship of said mounting means and said normally-tending means as to make the shifting of the sections out of and into aligned horizontal positions easily attained by slight muscular movements or body shifts of the occupant of the bed or light pressure by an attendant to an occupant; to provide improved manually-retractable means normally actuated to lock said sections in the horizontal and each of several angular positions; to provide improved latch means for rendering said locking means unretractable; to provide improved safety means for preventing the sudden action of said angularity-disposing means when said locking means is inadvertently retracted at a time when the bed is without mattress or occupant; to provide improved means for effecting a manual adjustment of the foot section in a bed of this kind; and to provide an improved mounting of a reading lamp on the bed bottom whereby it will be adjusted automatically to the most-desired angular disposition relative to the back section for each different angular position thereof.

In the accompanying drawings,

Fig. 1 is a plan view of a self-tilting bed constructed in accordance with this invention;

Fig. 2 is a side elevation of the construction shown in Fig. 1, as viewed from the side on which the manual controls are located;

Fig. 3 is an opposite side elevation;

Fig. 4 is an enlarged detail view of the manually-retractable locking mechanism;

Fig. 5 is an end view of the same;

Figs. 6, 7, 8, and 9 are perspective views illustrating some of the various relative angular positions into which the bed bottom sections may be adjusted; and

Fig. 10 is a side elevation of the bed showing, in full and dotted outlines, the altered angular relationship of the bed lamp and bed-bottom

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back section when the latter is in its horizontal and extreme angular positions, respectively.

A bed constructed in accordance with this invention comprises, a main supporting frame 10 whereon is mounted a sectional bed bottom 11 which, under the control of the occupant or an attendant, may be shifted into and locked in various relative angular positions as determined by a combination balancing and locking mechanism 12 and a foot-section adjusting means 13.

The supporting frame 10 is preferably of the usual angle iron construction comprising a pair of side rails 14 and 15 reinforced by transverse struts 16, 17, and 18 and so assembled and provided with auxiliary attachments as to permit the frame 10 either to be supported directly on a pair of head and foot ends or to be set on the side rails of a bedstead, in exactly the same manner as a conventional standard spring is set onto a conventional standard bedstead. In the construction herein shown the side rails 14 and 15 have flange plates 19 secured at each end which mount pairs of pins 20 adapted to be received in the conventional type notches (not shown) formed in plates 21 secured to legs 22 of the head and foot ends.

The transverse struts 16, 17, and 18 are preferably of angle iron, being riveted at their ends to the side rails 14 and 15. The transverse strut 16 has a bar 23, mounting rubber bumpers 24, swingably attached thereto and shiftable into and out of position to determine the horizontal disposition of the sectional bed bottom 11.

The bed bottom section 11 comprises a back section 25, a seat section 26, and a foot section 27, hingedly connected together at 28 and 29 and supported on a pair of brackets 30 and 31 and a pair of links 32 and 33 in such a manner that these several sections 25, 26, and 27 may be shifted into and out of several different non-horizontal angular positions as determined either by the desire of the occupant under certain circumstances or by the desire of the attendant to the occupant under certain other circumstances.

These bed bottom sections 25, 26, and 27 are made up of the usual angle iron forms, as clearly indicated in the drawings, reinforced by tubular struts 38 and 39, which are welded to and depend from the under side of the back section frame, and a strut 40, riveted to the foot section 27 near the end thereof adjacent its connection with the seat section 26. The strut 38 is positioned so as to engage the bumpers 24 on the bar 23, when the latter is in its upright position, so as to limit the downward movement of the back

section 25 and thereby dispose all of the sections in a horizontal plane. These reinforced frames provide a support for a fabricated bed bottom 34 secured to the sides and ends of the respective sections by conventional springs 35.

The back section 25 and seat section 26 are hingedly connected together at 28 by means of extensions 36 riveted or otherwise anchored to the side rails of the seat section 26. Similarly, the seat section 26 and the foot section 27 are hingedly connected together at 29 by means of extensions 37 riveted or otherwise anchored to the side rails of the foot section 27. The respective lengths of the sections 25, 26, and 27 are such that the pivotal connections 28 and 29, for most occupants of a bed of this kind, when the bed sections are in horizontal position, will come at about or near to the middle of the buttock and at the knees, respectively.

The brackets 30 and 31 are riveted or otherwise anchored to the side rails 14 and 15 respectively. They are so positioned longitudinally of the frame 10 that the pivotal connection 41 to the back section 25 is spaced an appreciable distance toward the head end of the back section 25 away from the hinge connection 28 of the sections 25 and 26.

The relative location of the pivots 41 to the hinge connection 28 is of vital importance. The aim is to so locate the pivots 41 and hinge connection 28 with regard to the body of the occupant of the bed that the buttock, when the bed sections are horizontal, will be footward of the pivotal connection 41 and the middle of the buttock approximately aligned with the hinged connection 28. Such a positioning of these pivots results in a balancing of the weight of the occupant on the back section 25 and seat section 26 so that a slight shifting of the weight longitudinally of the bed relative to the pivotal connection 41 will tend to determine the angularity of the bed sections as influenced and permitted by the combination balancing and locking mechanism 12.

The links 32 and 33 are pivotally connected at 32a to the side rails 14 and 15 of the frame 10 and at 32b to the side rails of the seat section 26. The pivotal connection 32b is slightly headward from the hinged connections 29 of the seat section 26 and foot section 27. The position of the pivotal connection 32a is below but slightly headward of the pivotal connection 32b, when the bed bottom sections 25, 26, and 27 are in their normal horizontally-aligned positions. The rocking of these links permits the shifting of the seat section 26 longitudinally of the frame 10 and to assume an angular position when the back section is shifted to a non-horizontal position.

The combination balancing and locking mechanism 12 comprises an adjustable tension spring 42, a locking mechanism 43, and a safety device 44.

The tension spring 42 is secured at one end to a lug 45 welded to the strut 39 on the bed-bottom back section 25. The other end of the spring is anchored to a nut 46 which is threaded to a rod 47 journaled on the reinforcing strut 16 of the frame 10 and provided with a crank handle 48. Such an arrangement of the spring 42 tends to urge the back section 25 toward a vertical position as shown in Figs. 7, 8, and 9. The force of the spring acting in this manner is of course determined by the adjustment of the nut 46 on the rod 47. That force would be governed by the weight of the occupant of the bed.

The locking mechanism 43 comprises a notched segment 49, a spring-actuated locking pawl 50, and a retracting handle 51.

The segment 49 is secured to the side rail of the back section 25 so that the axis of the notched periphery 52 of the segment is coincident with the pivot connection 41 of the bracket 30 and the back section 25. As will be most clearly observed from Fig. 5, the segment is offset at 53 and recessed at 54 so that the notched periphery 52 is located inwardly of the bracket 30. Obviously, the number of notches determines the number of angular positions in which the back section may be locked.

The pawl 50 is pivotally mounted at 55 on the bracket 30 and normally is urged by a spring 56 into engagement with the notched periphery 52 of the segment 49. The pawl is so positioned that when the bed-bottom sections are horizontal the pawl engages the next to the last notch (see Figs. 2 and 4). This provides for the back section 25 to be shifted downwardly from the horizontal and locked, as shown in Fig. 6.

The retracting handle 51 is a looped rod, the inner ends of which are anchored to an arm 57 pivoted concentrically with the pawl 50 at 55. A notch 58 formed in the lower end of the arm 57 straddles a pin 59 on the pawl 50. Thus a headward pull on the handle 51 will shift the pawl 50 against the action of the spring 56 to disengage it from the notched periphery 52 of the segment 49. The notch 58 is slightly larger than the pin 59. This allows the spring 56 to effect engagement of pawl 50 with the notched segment without having to swing the handle 51 through the full arc of its movement.

A latch 60, pivoted at 61 on the bracket 30, is shiftable into and out of position to engage the outer end of the pawl to render it unretractable by means of the handle 51.

An apron 62 is secured to the side rail of the back section 25 so as to extend below and protectively cover the notched periphery 52 of the segment 49.

The safety device 44 comprises a bar 63 hinged to an arm 64 on the back section 25 and shiftable relative to a pair of spaced shoulders 65 and 66.

The bar 63 is recessed along its upper and lower edges to provide parallel series of cam-shoulders 67 and hook-shoulders 68 adapted to co-act respectively with the pins or shoulders 65 and 66. As will be noted from Fig. 3, the cam-shoulders 67 are so formed that for the movement of the bar 63 in either direction it will be deflected upwardly by the cam-shoulder or pin 65 but its longitudinal movement will not be checked. On the other hand, the hook-shoulders or teeth 68 are so formed that upon engagement of one of such hook-shoulders with the pin or shoulder 66 no further longitudinal movement of the bar 63 headward of the frame section 10 would be permitted.

The pins or shoulders 65 and 66 are spaced apart vertically a distance slightly greater than the width of the bar 63. Thus during a controlled movement of the bed-bottom back section 25 the cam-shoulder 67 will elevate the bar 63 slowly and allow it to recede as the segment 49 moves to change the engagement of the pawl 50 with adjacent notches 52. As a consequence there will be no engagement of any one of the hook-shoulders 68 with the pin or shoulder 66. On the other hand, a sudden headward movement of the bar 63 would cause a cam-shoulder

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67 riding up over the pin or shoulder 65 to elevate the bar 63 enough to cause the engagement of a hook-shoulder 68 with the pin or shoulder 66. This would arrest any further movement of the bar 63 until there had been a sufficient retraction of the bar 63 footward as to release the hook-shoulder 68 from the pin or shoulder 66.

The shoulder 65 preferably constitutes a pivot for an arm 69 which mounts the pin or shoulder 66. A spring 70 connecting the lower end of the arm 69 and the reinforcing strut 16 of the frame 10 normally urges the arm 69 into a vertical position as shown in Fig. 3 and is arrested by a shoulder (not shown) on the side rail 15 of the supporting frame 10. This spring 70 serves to absorb the shock of a sudden engagement of one of the hook-shoulders 68 on the bar 63 with the pin or shoulder 66.

The number and relative disposition of the bar-shoulders 67 and 68 are such that they will co-act with the pins or shoulders 65 and 66 to arrest the movement of the back section 25 for each accidental release of the pawl 50 for the first four peripheral notches 52 on the segment 49, figuring from right to left on Fig. 4.

A housing 71 is mounted on the side rail 15 of the supporting frame 10 to enclose these safety device parts and prevent accidental access thereto.

The foot-section adjusting means 13 comprises a pair of links or hangers 72 and 73 each of which mounts a spring-actuated roller-arm 74 and 74', respectively, connected by a bar 74a. The position of these arms is determined primarily by an operating handle 75.

The link 72 includes a general vertically extending arm portion 72a rigidly attached to a median point of a longitudinally extending straight portion so as to provide a headward extension 78. The link 73 is formed from a single bar which is bent to correspond to the angularity of the arm and footwardly extending portions of the link 72. The upper end of the arm portion 72a of link 72, and the headward end of link 73 are pivoted to the hinge connection 29 of the seat section 26 and foot section 27, and the footward end of the links 72 and 73 are pivoted to links 76 which in turn are pivoted at 77 to the side rails 14 and 15 of the supporting frame 10. A lever 79 in the form of a plate is pivoted to the extension 78 and is connected to roller arm 74 by means of a connecting link 80. An operating handle 75, similar in shape to handle 51, is secured to the link 79 and serves to shift the roller arm 74 to elevate the foot section 27, as will later be described in detail.

The roller arms 74 and 74' are pivoted at 81 to the respective links 72 and 73 near the headward end of the foot section 27. Each has a roller 82 on the upper end thereof engaging the under side of the flanged side rail of said foot section 27. Springs 83 and 83' interposed between the arms 74 and 74' and the links 72 and 73 normally urge the roller arms headward of the bed so as to tend to elevate the foot section 27 when free of the weight of a mattress and the legs of an occupant of the bed.

A pair of arms or fingers 84 are concentrically pivoted with the connection of the links 72 and 73 to the arms 76, and are connected together by a rod 85 so that they may be moved in unison. These arms or fingers 84 are manually shiftable into and out of an elevated position to locate the upper ends in engagement with the under faces of the flanged side rails of the foot section 27.

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Pins 86 on the arms 84 are positioned to abut shoulders 87 on the arms 76 and limit the movement of the fingers 84 when swung headwardly beyond a vertical position.

Inasmuch as this bed has been designed primarily for use either by a convalescent person or by one whose condition requires such a one to spend a good deal or all of the time in bed, or for one who merely likes to read in bed, a lamp is mounted on the bed and otherwise connected thereto so that its angularity with regard to the back section will be automatically adjusted with the angular movements of the bed bottom sections. The aim is to secure an adjustment of the light in approximately the position most convenient for reading by the occupant of the bed. To that end a shaded electric lamp 88, preferably of the fluorescent type, is mounted on a post 89 pivotally connected to a clamp plate 90 and further connected by a rod 91 to the bracket 31.

The post 89, pivoted to the clamp 90 at 92, has an extension 93 below the side rail of the back section 25 and to which is connected the rod 91. The clamp plate 90 is secured to the side rail of the back section 25 by means of a hand screw 94, so as to position the lamp post 89 approximately even with the head end of the back section 25.

The rod 91 is connected to the bracket 31 at the point 96 below the pivotal connection 41 with the back section 25 and footwardly thereof so that, when the back section 25 is shifted from its horizontal position to any of its upward non-horizontal positions, the transverse angularity of the lamp post 89 will be increased gradually, thus throwing the lamp 88 further headward of the bed-bottom back section as it moves into its extreme upwardly-inclined angular position (see Fig. 10). Incidentally, this connection ensures the lamp being kept out of contact with the head of the bed, particularly when the back section 25 is declined below the horizontal.

The operation of the bed herein shown is substantially as follows:

With a mattress on the bed bottom the tension of the spring 42 is so adjusted to the character of the occupant, from the standpoint of weight and length, that upon retracting the pawl 50 through an elevation of the handle 51 the bed-bottom sections may be shifted between their normal horizontally-alined positions and any of several angular positions by either the occupant of the bed or an attendant, and with a very slight effort on the part of either.

For the occupant, when the bed-bottom sections are in their alined horizontal positions, a slight shifting of the weight footwardly relative to the hinged connection 28 of the back section 25 to the seat section 26, and therefore of necessity relative to the pivotal support 41 of the back section 25, will permit the force of the spring 42 to urge the back section 25 toward its extreme angular position. Once the pawl 50 is retracted and the weight of the occupant thus shifted, the back section 25 will move instantly to such an extreme angular position, as shown in Fig. 9, unless arrested by the release of the pawl-retracting handle 51.

The seat section 26 and the foot section 27 will be shifted headwardly slightly and, of necessity, into angular positions as shown in Fig. 9.

When the bed bottom sections occupy any non-horizontal angular positions and the occupant desires to have the bed bottom sections assume

their normal horizontally-aligned positions, the occupant has only to retract the pawl 50 and then slightly extend the body against the seat section and/or press his head and shoulders against the back section 25. Such a shift in the occupant's weight will be sufficient to counter-balance the effect of the spring 52 so as to cause the back section 25 to swing about the pivot 41 to a horizontal position, causing the other sections to shift accordingly.

In the event an attendant desires to do the shifting of the bed bottom sections, in either of the ways above mentioned, it is only necessary to retract the pawl 50, by applying one hand to the handle 51, and apply a little pressure at the head end of the back section 25.

If at any time it should be desired to have the back section 25 decline below the horizontal, it is only necessary to swing the bumper bar 23 so as to move it out of alignment with the strut 38 whereupon the back section 25 could be depressed, by either the occupant or the attendant in the manner above explained, to occupy the position shown in Fig. 6.

When the section 25 is in its declined position, the effort which the occupant is required to exert to cause the bed-bottom sections to assume a horizontal position is somewhat greater than is required to start the shift of the back section 25 upwardly out of horizontal position. This fact is apparent for the reason that, when the back section is in a declined position, it is not so easy for the occupant to shift the weight up the incline of the back section. However, the occupant is aided by the fact that the transverse part 98 of the handle 51, where it connects with the arm 57, abuts against the surface 99 on the segment 49. Thus, the pull on the handle 51 results in the transverse part 98 of the handle 51 bearing against the segment 49 at the point 99 and providing a cam section that helps to initiate the upward swing of the back section 25 toward its normal horizontal position. When the surface 99 on the segment 49 is displaced sufficiently toward the head of the bed, the transverse portions 98 of the handle 51 are engageable with the bracket 30 to prevent further movement of the handle 51. It will be apparent, therefore, that whether further movement of the handle 51, after disengagement of the pawl 50, is arrested initially by its engagement with the surface 99 of the segment 49, as when the back section is disposed in its horizontal or lower-than-horizontal position, or by engagement with the bracket 30, as when the back section is raised above the horizontal, the handle 51 serves as a brace against which the bed occupant can pull to assist himself in adjusting the position of the bed bottom.

In the event it is desired to render the pawl 50 unretractable, either accidentally or by the occupant of the bed, the latch 60 can be thrown up into the position shown in Fig. 4.

The safety device 44 is provided so as to ensure against a sudden swinging of the back section 25 from a horizontal position, or from any of its non-horizontal positions short of its extreme upwardly-inclined position, into such extreme upwardly-inclined position. This is to provide against an emergency where the bed was unoccupied and the mattress was removed and a person was bending over the bed for the purpose of cleaning or doing other work on the back section. Were it not for this safety device and the handle 51 were, under such circumstances, accidentally

depressed to disengage the pawl 50, the sudden upward swinging of the back section 25 might cause severe head injury.

With this safety device operative, if one were thus bent over the back section and accidentally actuated the handle 51 to retract the pawl 50, the sudden movement of the bar 63 would cause the cam shoulder 64 acting on one of the cam shoulders 67 to throw the bar 63 upwardly with such force as to cause the engagement of one of the hook-shoulders 68 with the pin or shoulder 66. The hook-shoulders 68 in number and in position are such that an uncontrolled movement of the back section could only be for the distance between any one of the first five notches of the segment 49.

When the pair of fingers or arms 84 are in their elevated position, as shown in Figs. 2 and 3, it will be obvious that, with the shifting of the back section 25 into and out of its horizontal position, the seat and foot sections 26 and 27 are automatically shifted into certain angular positions. As the pivotal connection 28, of the back section 25 to the seat section 26, moves in an arc around the pivotal connection 41 of the back section 25 to the brackets 30 and 31, said seat and foot sections are not only shifted headwardly or footwardly of the bed frame 10 but are drawn into predetermined angular positions with respect to the back section 25.

Obviously, the headward and footward swinging of the links 32 and 33 will cause a corresponding headward and footward movement of the links 72 and 73 and a rocking of the supporting arms 76. This will alter the angularity of the fingers or arms 84 when in their elevated positions, as will most clearly be seen from Fig. 9. Also, in the absence of any counteracting manual shifting of the handle 75 the roller arm 74 will be further depressed, as shown in Figs. 7 and 9. Thus, because of the weight of the mattress and the occupant's feet on the foot section 27, the normal tendency of the foot section 27, when the head section 25 is shifted out of its horizontal position, will be for the footward end thereof to drop toward the supporting frame.

There may be occasions when it is desired to have the foot section 27 elevated with regard to the seat section 26. This can be effected by a headward pull on the handle 75 by either the patient or an attendant. The consequent swinging of the handle plate 79, about its pivot to the link 78, will cause a headward movement of the roller arms 74 and 74' to a position such as shown in Figs. 6 and 8 and as a consequence support the foot section 27 in an elevated position.

From Fig. 10 it will be noted that when the bed bottom sections 25, 26, and 27 are in their normally horizontally-aligned positions the lamp post 89 is perpendicular to the plane of these sections. Hence, the light of the lamp 88 will be in the best position for the occupant in such a prone position. As the back section 25 moves from the horizontal toward the extreme inclined position, the rod 91 causes the lamp post 89 to swing headwardly and assume an angular position, with respect to the head section, of considerably more than 90°. This receding of the lamp 88 tends to direct the illumination therefrom at an angle best for the occupant of the bed when in an inclined position.

Variations and modifications in the details of structure and arrangement of the parts may be resorted to within the spirit and coverage of the appended claims.

I claim:

1. In a bed of the class described, the combination of a generally horizontal supporting frame, a bed bottom comprising a back section, a seat section, and a foot section hinged together at their abutting ends, upstanding brackets on said frame provided at their upper ends with pivotal connections for said bed-bottom back section at points on said back section materially headward from the hinged connection of said back and seat sections, means on said frame adjustably supporting said seat and foot sections to permit the relative angular disposition of said sections, means normally urging said back section upwardly, a notched segment secured to said back section coaxially of said pivotal connection of said back section on one of said brackets, a pawl pivoted on said one bracket and normally urged to engage said notched segment for locking said back section in any one of several angular positions, an upwardly-disposed arm pivoted concentrically with said pawl, co-acting pin and slot means securing said pawl and arm for unison movement, and a handle secured to said arm and extending upwardly above said bed bottom sections, said handle being engageable with said bracket after said pawl is disengaged from said segment whereby said handle serves as a brace against which the bed occupant may exert force to effect a shifting of said sections.

2. In a bed of the class described, the combination of a supporting frame, a bed bottom comprising a back section pivotally mounted on said frame, a seat section, and a foot section, all of which sections are hinged together at their abutting ends, means for shiftably supporting said seat section on said frame so as to permit the hinging movement of said seat and back sections when said back section is swung on its pivot, means for securing said back section in any one of several angular positions, a hanger pivoted at one end to said seat section and shiftably supported on said frame adjacent to the foot thereof, an arm pivoted on said hanger and movably engaging said bed-bottom foot section, and manually-operable means mounted on said hanger for rocking said arm so as to rock said foot section and thereby vary the angular relationship of said foot section with respect to said seat section.

3. In a bed of the class described, the combination of a supporting frame, a bed bottom comprising a back section pivotally mounted on said frame, a seat section, and a foot section, all of which sections are hinged together at their abutting ends, a pair of links each pivoted at one end to said frame and at the opposite end to a side of said seat section adjacent the hinged connection of said seat section and said foot section so as to permit the hinging movement of said seat and back sections when said back section is swung on its pivot, means tending to swing said back section upwardly, manually-disengageable locking means normally serving to secure said back section in any one of several angular positions, a hanger pivoted at one end to said seat section and shiftably supported on said frame adjacent to the foot thereof, an arm pivoted on said hanger, a roller on the upper end of said arm engaging said foot section, a lever pivoted to said hanger, a link connecting said lever and said arm, said lever being manually actuable to shift said roller arm to change the angular relationship of said foot section with respect to said seat section, and a spring connecting said arm and

hanger so as to normally urge said arm toward a position that would elevate said foot section.

4. In a body-supporting structure, the combination of a supporting frame, an articulated bed bottom movably supported thereon, said bed bottom including a seat section and a foot section hingedly connected to said seat section to permit angular adjustment of said foot section with regard to said seat section, a hanger pivoted to one of said sections adjacent their hinged interconnection and movably supported on said frame, an arm pivoted on said hanger and normally disposed with one end in longitudinally movable supporting contact with said foot section, a handle connected to said arm and disposed in convenient reach of an occupant normally postured on said bed bottom whereby said handle may be shifted by said occupant to alter the angularity of said foot section relative to said seat section.

5. In a body-supporting structure the combination of a frame, a back section pivotally mounted on said frame, a seat section hingedly connected to said back section and shiftably supported on said frame to permit movement of said seat section longitudinally of said frame when said back section is shifted to change its angularity with regard to said frame, manually disengageable locking means normally serving to secure said back section in any one of several angular positions, a foot section hinged to said seat section, a hanger pivoted adjacent to the hinged connection of said seat and foot sections and supported on said frame to permit longitudinal movement of said hanger relative to said frame when said back section is swung on its pivot, an arm pivoted on said hanger and normally disposed with the upper end movably engaging said foot section, a handle pivoted on said hanger and disposed in convenient reach of an occupant normally postured on said sections, and a link connecting said handle to said arm whereby said handle may be shifted by the occupant of said sections to alter the angularity of said foot section relative to said seat section.

6. In a body-supporting structure the combination of a frame, a back section pivotally mounted on said frame, a seat section hingedly connected to said back section and supported on said frame to permit movement of said seat section longitudinally of said frame when said back section is shifted to change its angularity with regard to said frame, manually disengageable locking means normally serving to secure said back section in any one of several angular positions, a foot section hinged at one of its ends to said seat section and being free at its other end, a hanger pivoted to the hinged connection of said seat and foot sections and extending beneath said foot section toward the free end thereof, a rocker arm pivotally connecting the footward end of said hanger and said frame to permit longitudinal movement of said hanger relative to said frame when said back section is swung on its pivot, an arm pivoted on said hanger and normally disposed with its upper end movably engaging said foot section, a handle pivoted on said hanger and disposed in convenient reach of an occupant normally postured on said sections, and a link connecting said handle and said arm whereby said handle may be shifted by the occupant of said sections to alter the angularity of said foot section relative to said seat section.

7. In a body-supporting structure, the combina-

tion of a supporting frame, a back-support section pivoted on to said frame for swinging movement between a reclined position and an upwardly extending position, means for urging said back-support section toward said upwardly extending position, inter-engageable stop means connected respectively to said back-support section and to said frame for preventing relative movement of said back-support section and said frame, said stop means being normally disengaged throughout gradual upward movement of said back support section, and means responsive to sudden upward movement of said back-support section to effect engagement of said stop means.

8. In a body supporting structure, the combination of a supporting frame, a back-support section pivoted on said frame for swinging movement between a reclined position and an upwardly extending position, means for urging said back support section toward said upwardly extending position, a hook member connected to said back-support section and movable therewith relative to said frame, a shoulder on said frame adapted to be engaged by said hook member to prevent relative movement of said back-support section and said frame, said hook member and said shoulder being normally disengaged throughout gradual upward movement of said back-support section, and means responsive to sudden upward movement of said back-support section to effect engagement of said hook member with said shoulder.

9. In a body supporting structure, the combination of a supporting frame, a back-support section pivoted on said frame for swinging movement between a reclined position and an upwardly extending position, means for urging said back-support section toward said upwardly extending position, a shoulder on said frame, a ratchet member connected to said back section and adapted to engage said shoulder to prevent upward movement of said back-support section, said ratchet member being normally disengaged from said shoulder, and means responsive to sudden upward movement of said back-support section to cause said ratchet member to engage said shoulder.

10. In a body supporting structure, the combination of a supporting frame, a back-support section pivoted on said frame for swinging movement between a reclined position and an upwardly extending position, means for urging said back support section toward said upwardly extending position, a pair of spaced apart shoulders on said frame and a bar connected to said back section for longitudinal axial movement between and relative to said shoulders when said back support section is shifted on its pivot, said bar having teeth formed along one edge engageable with one of said shoulders to prevent upward movement of said back-support section, said bar having on its opposite edge a series of cam surfaces normally engaged with the other of said shoulders to alternately move said teeth toward said one shoulder during said longitudinal movement, said teeth being normally disengaged from said one shoulder during gradual upward movement of said back support section but being deflected into engagement with said one shoulder when said back section is abruptly raised.

11. An adjustable bed comprising a supporting frame, a bed bottom including a foot section and an adjacent section hingedly connected to said foot section, means movably supporting said adjacent section upon said frame for shifting

movement longitudinally of said frame, a movable support for said foot section including an upwardly extended arm pivotally connected to said frame and movably engaging said foot section, and a link pivotally connected to said adjacent section and to said arm, said foot section normally resting upon the upper end of said arm.

12. An adjustable bed comprising a supporting frame, a bed bottom including a foot section and an adjacent section hingedly connected to said foot section, means movably supporting said adjacent section upon said frame for shifting movement longitudinally of said frame, a movable support for said foot section including a link pivotally connected at one end to said adjacent section and a second link pivoted to said frame and to said first-mentioned link, an upwardly extending arm pivoted on said second link and movably engaging said foot section, said foot section normally resting upon the upper end of said arm, said arm being movable on its pivot to a non-supporting position to permit said foot section to be lowered.

13. In a bed of the class described, the combination of a supporting frame, a bed bottom comprising a back section pivotally mounted on said frame, a seat section, and a foot section, all of which sections are hinged together at their abutting ends, said seat section being shiftably mounted on said frame so as to permit the hinging movement of said seat and back sections when said back section is swung on its pivot, a hanger pivoted at one end to said seat section and a link pivoted to said frame and to said hanger, an upwardly extending arm pivoted to said link and normally engaging said foot section to determine the normal position thereof, a second arm pivoted on said hanger, a roller on the upper end of said second arm engaging said foot section, a lever pivoted to said hanger, and a second link connecting said lever and said second arm, said lever being manually actuable to shift said second arm to change the angular relationship of said foot section with respect to said seat section, said first mentioned arm being shiftable to a non-engaging position to permit said foot section to be lowered.

14. In a body supporting structure, the combination of a supporting frame, a back support section pivoted on said frame for swinging movement between a reclined position and an upwardly extending position, means for urging said back support section toward said upwardly extending position, a pair of spaced apart shoulders on said frame and a bar connected to said back section for longitudinal axial movement between and relative to said shoulders when said back support section is shifted on its pivot, said bar having teeth formed along one edge engageable with one of said shoulders to prevent upward movement of said back support section, said bar having on its opposite edge a series of cam surfaces normally engaged with the other of said shoulders to alternately move said teeth toward said one shoulder during said longitudinal movement, said teeth being normally disengaged from said one shoulder during gradual upward movement of said back support section but being deflected into engagement with said one shoulder when said back section is abruptly raised, said one shoulder being resiliently cushioned on said frame to absorb the shock of the engagement therewith of said teeth.

15. An adjustable bed structure comprising a supporting frame, a bed bottom including a foot

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section and an adjacent section hingedly connected to said foot section, means movable supporting said sections on said frame for shifting movement longitudinally of said frame and for angular adjustment of said foot section relative to said adjacent section as an incident to said shifting movement, said means including an upwardly extending arm pivoted to said supporting frame and slidably engaging said foot section, and link means interconnecting said arm and said adjacent section for swinging said arm downwardly when said sections are shifted toward the head of said bed structure.

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