

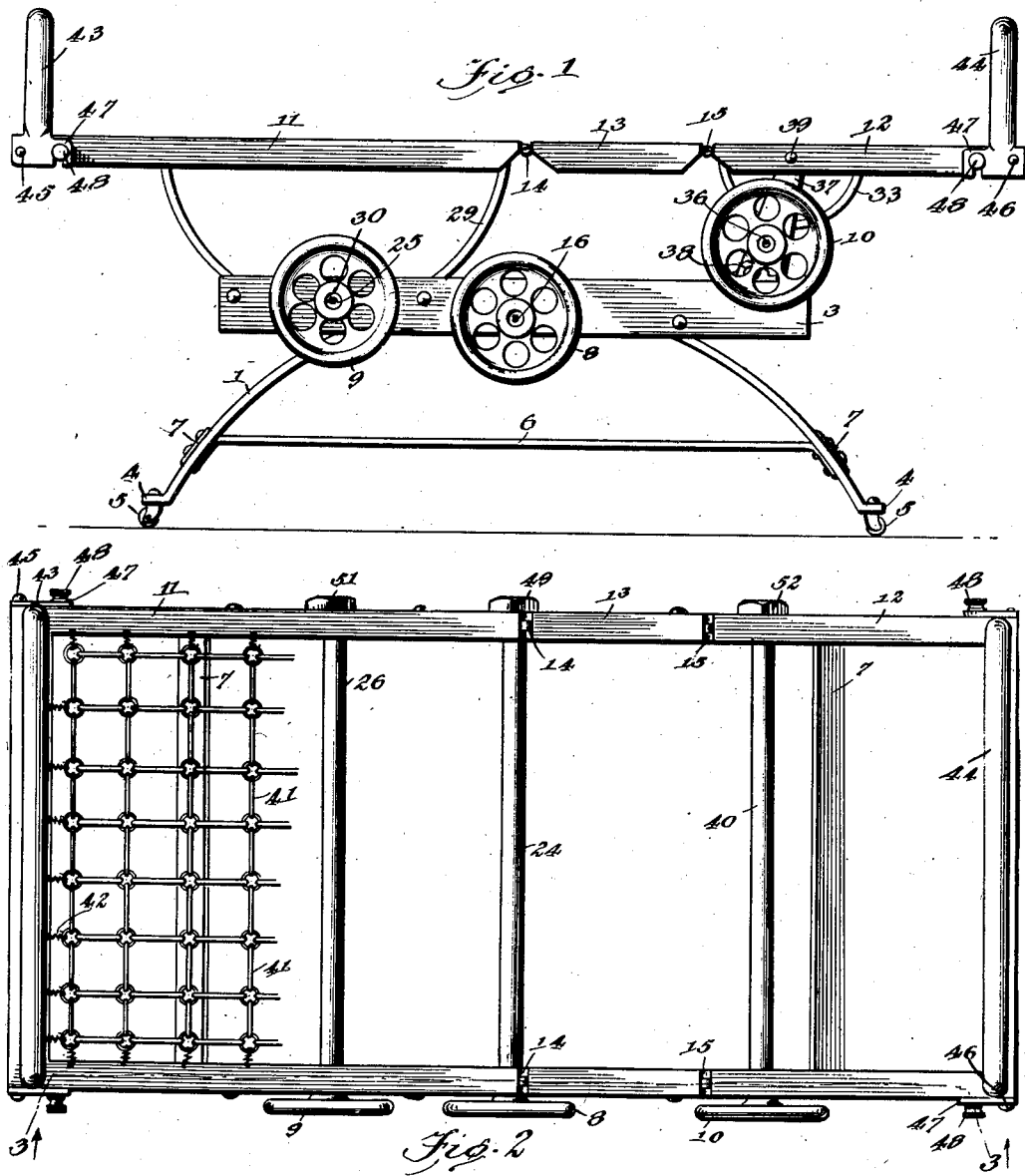
March 17, 1925.

1,529,699

C. A. HAWK
ADJUSTABLE HOSPITAL BED

Filed March 31, 1924

3 Sheets-Sheet 1



WITNESSES

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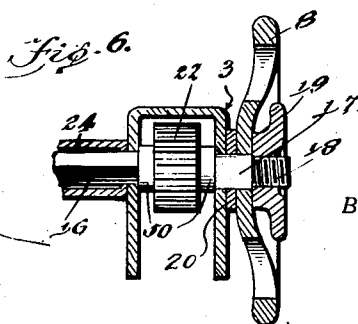
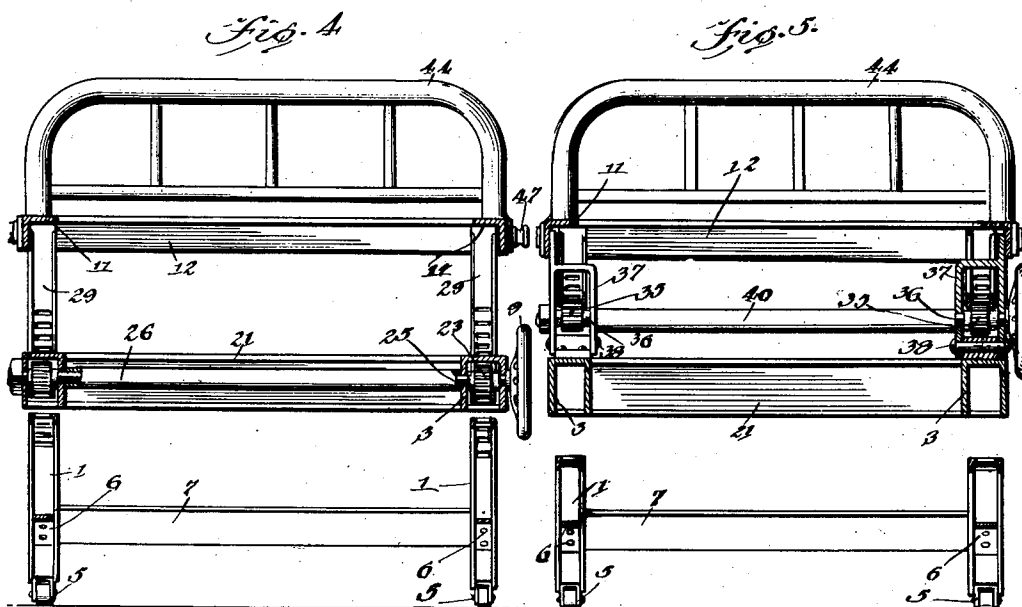
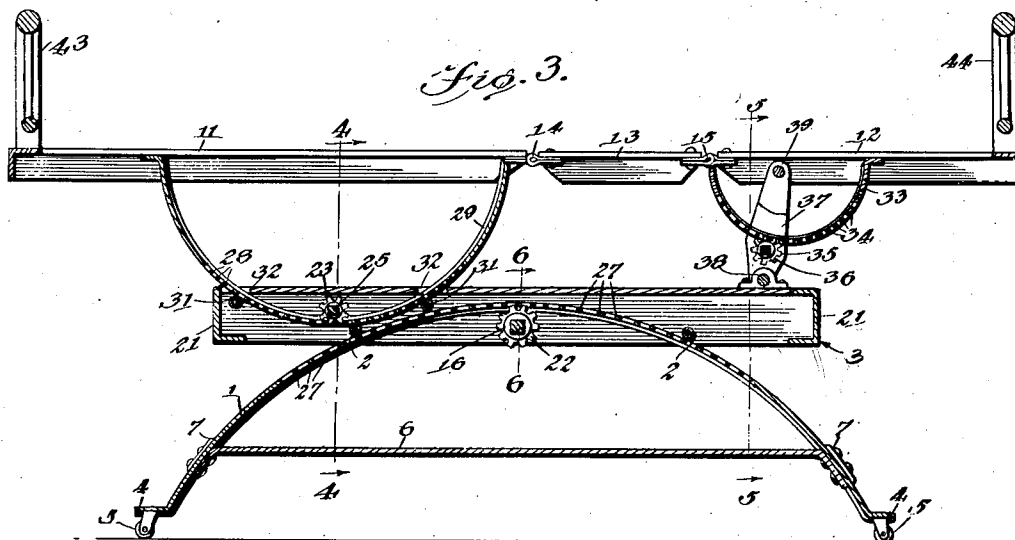
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3 Sheets-Sheet 2



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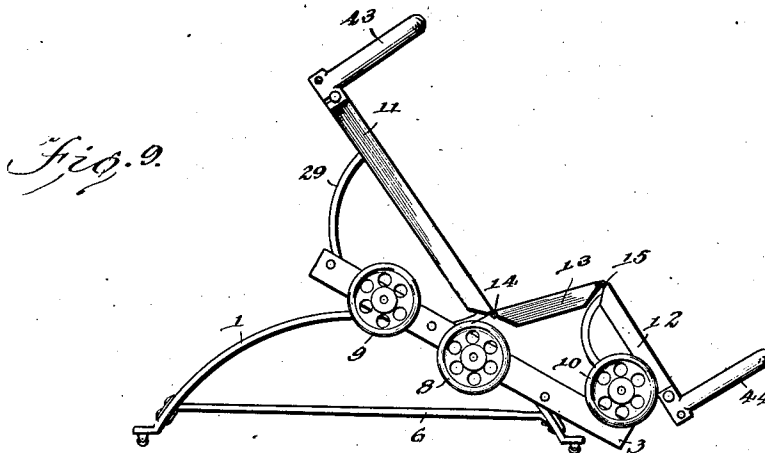
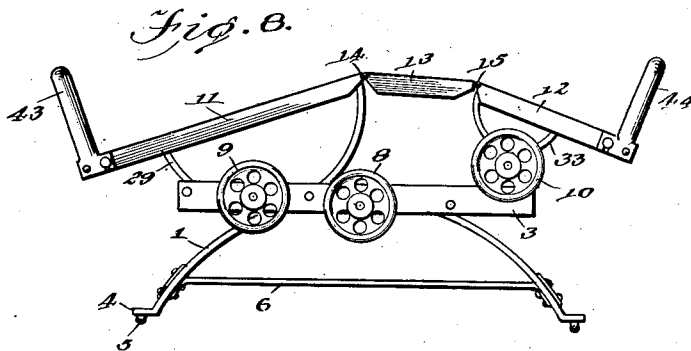
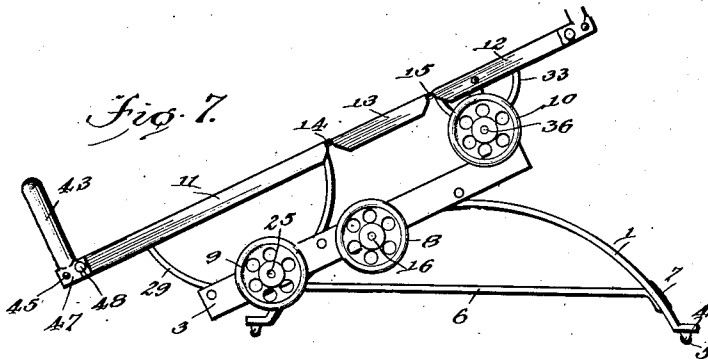
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C. A. HAWK

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1,529,699

UNITED STATES PATENT OFFICE.

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ADJUSTABLE HOSPITAL BED.

Application filed March 31, 1924. Serial No. 703,206.

To all whom it may concern:

Be it known that I, CHARLES A. HAWK, a citizen of the United States, and resident of Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Adjustable Hospital Beds, of which the following is a specification.

My invention relates to improvements in adjustable beds adaptable particularly for hospital and sanitarium use, and it consists of the constructions, combinations and arrangements herein described and claimed.

An object of the invention is to provide a bed for the purpose described, which has various controls for the adjustment of the bed into such positions as will contribute most fully to the needs and comfort of the person occupying the bed.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the improved adjustable bed.

Figure 2 is a plan view thereof, only a portion of the bed springs and wire mattress being shown.

Figure 3 is a longitudinal section of the bed taken substantially on the line 3—3 of Figure 2.

Figure 4 is a section on the line 4—4 of Figure 3.

Figure 5 is a section on the line 5—5 of Figure 3.

Figure 6 is a detail section on the line 6—6 of Figure 3.

Figure 7 is a detail side elevation showing how the entire bed frame may be tilted.

Figure 8 is a detail side elevation showing how the bed may be bowed into a convex shape.

Figure 9 is a detail elevation showing how the bed may be adjusted so that the user may assume a sitting posture.

Record is made of my prior Patent 1,118,199 granted November 24, 1914, on an adjustable supporting device for movable objects. In that patent use is made of bowed supports, and in adapting these bowed supports to the specific use herein disclosed the necessity arose of making numerous modifications and changes to meet the particular needs involved.

In carrying out the invention provision is

made of a pair of bowed supports 1 which are constructed of metal or other suitable material in channel form, the channels extending downward (Fig. 4) to leave the tops smooth and unobstructed. The tops of the bowed supports provide tracks upon which the rollers 2 of the bed frame 3 run in adjusting the latter as illustrated in Figures 7 and 9.

End portions 4 of the supports 1 carry caster rollers 5 which are capable of turning in any direction to follow the intended movement of the bed. These rollers are of a quite common construction. The ends 4 are turned outward (or inward, if desired) into the plane of the floor so that the caster rollers may be mounted.

Braces 6 add strength and help to maintain the bowed shape of the supports. Transverse braces 7 hold the supports together. The supports 1 are arcuate in form, and the bed frame 3 is adjustable thereupon in the longitudinal direction upon turning a hand wheel 8 at one side of the bed. Similar hand wheels 9 and 10 on the same side are for the purpose of adjusting the head and foot sections 11 and 12 of the body frame, this frame including a seat section 13. The various sections are suitably hinged together at 14 and 15. The hand wheel 8 is mounted upon and operates a shaft 16 (Fig. 6). The shaft 16 is squared so as to present the non-circular portion 17 at one exposed end for the non-turning mounting of the hand wheel 8. The opposite end of the shaft is headed at 18 (Fig. 2). The exposed end of the shaft is threaded as at 18 and forms a stud upon which the binding nut 19 works to fix the hand wheel in any position of adjustment. For this purpose the hand wheel presses against a suitable washer 20 next to the bed frame 3. This frame is of inverted channel metal construction in so far as the sides are concerned, the ends 21 also being of channel construction but not inverted as may clearly be seen in Figure 3.

The inversion of the side members of the bed frame provides a housing for the gears 22 and 23 which respectively operate the bed frame 3 and the head section 11. The gears have hubs 24 which fit inside of the side members 3. Upon screwing down on the wheels 19 the side members, gear hubs and tubes or sleeves are clamped together. The movable shaft 16 by which the gear 22 is

turned, is housed by a tube 24 as it passes from one side of the bed frame to the other. This is also true of the shaft 25 which carries the gear 23. This shaft is housed by a tube 26 (Fig. 4). Each of the shafts 16 and 25 carries a pair of gears, each gear being housed in the corresponding side channel frame.

For the purpose of effecting the adjustment already mentioned the bowed supports 1 have regularly spaced perforations providing teeth 27 with which the gears 22 mesh. Similarly the gears 23 mesh with similarly formed teeth 28 in a pair of arcs 29 which carry the head section 11. It is to be observed that the slots which form the teeth 27 are narrower than the arcuate supports 1. This leaves the side portions continuous to thereby provide tracks upon which the rollers 2 run. This is true of the other arcs shown. The mounting of the hand wheel 9 on the shaft 25 of the head section is similar in all respects to the arrangement in Figure 6. A nut 30 fixes the hand wheel 9 in position so that the head section 11 may not depart from a particular adjustment.

Rollers 31 (Fig. 3) housed by the sides of the bed frame support the arcs 29. It is upon these rollers that the arcs move during adjustment. The arcs pass through openings 32 in the top of the frame 5. The connection of the ends of the arcs with the head section 11 is fixed and permanent.

Arcs 33 are similarly attached to the foot section 12. These are smaller than the arcs 29, but of identical construction both as to the channeled formation and as to the provision of teeth 34 with which the gears 35 on a shaft 36 mesh. Both the shafts 23 and 36 are noncircular, and are headed at one end as at 51 and 52. The shaft 36 is journaled in double links 37 which are pivotally mounted at 38 upon the bed frame and also pivotally mounted at 39 to the side flanges of the foot section. This section, like the others in the body frame, is made of angle iron. A tube 40 encloses the shaft 36 the same as in the other instances.

A bed bottom 41 (Fig. 2) occupies the space within the body frame of the bed. This mattress is supported by numerous springs 42 which make direct connection with the angle irons of the various frame sections. Upstanding ends 43 and 44 have pivotal connection at 45 and 46 with the head and foot sections 11 and 12 respectively. The ends have extensions 47 which are notched so that they may fit over the shanks of screws 48 and rest in the upright positions shown. Upon turning down on the screws 48 the respective ends are held in fixed position. Upon unloosening the screws the ends may be swung down on the pivots 45 and 46 in out of the way positions.

The operation of the improved bed may readily be understood from the following additional description. The bed may be moved around without restriction so far as its position in the room is concerned, inasmuch as it is provided with caster rollers 5. The head and foot sections 11 and 12 are capable of adjustment by means of the hand wheels 9 and 10. The seat section 13 may be regarded as a free or idle member inasmuch as it follows one or the other of the foregoing sections according to the particular adjustment made.

Assume, for example, that the body frame is perfectly level as in Figure 1. The body frame is comprised of the three sections 11, 12 and 13, and is so termed because it is upon this frame that the body of the person is most directly supported. Suppose now that it is desired to raise the head section 11 a little. The hand wheel 9 is turned in the clockwise direction whereupon the gears 23 (Fig. 3) turn the arcs 29 upward toward the left so that the section 11 is raised.

This raising of the head section will produce a slight pull on the foot section 12 which will yield by a swinging of the double links 37 upon the pivots 38. However, the particular relationship of the section 12 itself to the link 37 is not changed.

The seat section 13 will properly adapt itself to the particular position of the head and foot sections. By properly manipulating the various hand wheels almost any desirable position of the body frame is attained.

The adjustment of the bed frame 3 and its adjustment upon the main supports 1 is independent of the particular adjustment of the sections of the body frame 12. After the desired relative positions of the body frame sections have been attained further adjustment of the entire bed frame in relation to the supports 1 may be made by turning the hand wheel 8 in one or the other direction. Turning the hand wheel 8 toward the left will cause the bed frame 3 to move down into the position shown in Figure 9 so that the occupant of the bed assumes a sitting posture as near as may be. It is necessary to properly adjust the body frame sections into the sitting posture by turning the hand wheels 9 and 10.

While the construction and arrangements of the improved bed as herein described and claimed is that of the generally preferred form, obviously modifications and changes may be made without departing from the spirit of the invention or the scope of the claims.

I claim:—

1. A device of the character described comprising a bed frame, bearing means including rollers carried by the frame, sup-

porting means for the frame upon which the rollers bear, said means therefor constituting a track, and means carried by the bed frame which engage with the support and which is turnable, to shift the position of the bed frame with respect to the supporting means.

2. A device of the character described comprising a bed frame including inverted parallel channel side members, bearing means including rollers housed by said members, arcuate supports extending into said members receiving the rollers and therefor constituting tracks, a turnable shaft carried by the side members, and means carried by the shaft also housed by the channel members and engaging the supports to shift the bed frame in respect thereto upon turning of the shaft.

3. A device of the character described comprising a bed frame including inverted parallel channel members, bearing means including rollers housed by said members, arcuate supports extending into said members receiving the rollers and therefor constituting tracks, a turnable shaft carried by the side members, means carried by the shaft also housed by the channel members and engaging the supports to shift the bed frame in respect thereto upon turning of the shaft, and means to frictionally lock the shaft to prevent turning thereof and thereby hold the bed frame in any adjusted position.

4. A device of the character described comprising a bed frame including parallel inverted side channels, bearing means including rollers housed by the channels, arcuate supports extending into said channels so that the rollers may bear thereon, said supports providing means having gear teeth, a shaft extending from one channel to the next, gears carried by the shaft one being situated in each channel to engage said teeth, means to turn the shaft and thereby cause the gears to move over said teeth and shift the position of the bed frame in respect to the arcuate supports, and means associated with said turning means to frictionally lock it and the shaft in any position of adjustment.

5. A device of the character described comprising a bed frame including parallel inverted channel side members, bearing means including rollers housed by said side members, arcuate supports extending into the side members from beneath, said rollers bearing thereon said supports having a plurality of radially spaced openings providing gear teeth, bracing means by which both the arcuate shape of the supports and their spaced relationship are preserved, a shaft extending from one side member to the other and passing therethrough, said shaft being headed at one end, and threaded at the other, a sleeve fitted upon the shaft between

the side members, gears carried by the shaft within the side members and engaging the teeth of said supports, means upon the shaft to turn it and the gears causing the bed frame to travel upon said arcuate supports, and means screwed upon said threaded ends to bind the side members, sleeve and shaft in fixed position to maintain the adjustment of the bed frame.

6. A device of the character described comprising a bed frame including parallel inverted channeled side members, arcuate toothed supports extending into the side members, bearing means including rollers resting on the supports, a non-circular shaft extending across the bed frame and through the side members, said shaft being headed at one end and threaded at the other, gears carried by the shaft situated in each side member and having hubs engageable with the side members on the inside, a hand wheel mounted on the non-circular shaft disposed at the threaded end to turn the gears in respect to the toothed supports and thereby shift the position of the bed frame, a sleeve carried by the shaft between the side members, and a clamp wheel carried by the threaded end of the shaft to bind the parts together in any adjusted position of the bed frame.

7. In a bed of the character described, a bed frame including parallel inverted channeled side members, arcuate supports extending into the side members, and being transversely slotted to provide gear teeth, the length of the slots being less than the width of the supports to leave continuous edge portions providing tracks; means housed in the side members including rollers bearing on said supports and particularly on said tracks, and means carried by the bed frame for adjusting it in respect to said supports, said means including gears housed by the side members engaging said teeth and having hubs substantially fitting the interior of the side members.

8. A bed comprising supporting means, a bed frame mounted thereupon, means to adjust the bed frame upon said supporting means, a body frame composed of a plurality of sections hinged together, supporting means for the body frame upon the bed frame including arcs carried by two of the sections, links supplementing the arcs of one of the sections having pivotal connection both with said section and with the bed frame, means for adjusting the arcs of the other section resulting in a yielding of the links and a change of contour of the body frame, and means for independently adjusting the other arcs in respect to said links producing a further change of contour.

9. A bed comprising supporting means, a bed frame adjustable thereupon, a body frame composed of head, seat and foot sec-

tions hinged together, supporting means for the head section upon the bed frame including arcs, supporting means for the foot section upon the bed frame including links pivoted to each, and means carried by the bed frame for moving the arcs thereby adjusting the head section, said seat and foot sections properly adapting themselves by virtue of said hinge and link connections.

10 10. A bed comprising supporting means, a bed frame adjustably mounted thereon, a body frame composed of head, seat and foot sections, arcs carried by the head section, supporting means on the bed frame for the head section including rollers on which the arcs bear, means carried by the bed frame engaging the arcs and arranged to be turned to thereby adjust the head section, links supporting the foot section upon the bed frame being pivotally mounted to each, said links yielding upon adjustment of the head section, means by which the various sections are hinged together so that they may respond to adjustments of the head section, and means for independently adjusting the foot section, said means including arcs carried thereby, and means carried by the links with which the arcs engage being turnable to swing the foot section on its pivot-
30 al mountings.

11. A bed comprising arcuate supports, a body frame composed of head, seat and foot sections, arcs carried by the head and foot sections, a bed frame including inverted side channelled members having openings to admit the arcs of the head section and receiving the arcuate supports from beneath, two sets of rollers in each side member against which the respective arcs bear, means carried by the side members engaging the arcuate supports for shifting the bed frame and its carried parts, means carried by the side members engaging the head section arc for independently adjusting the head section, links by which said section is pivotally attached to the bed frame permitting yielding upon said adjustment of the head section, and means carried by said links engaging with the foot section arcs for independently adjusting the foot section.

12. A bed comprising arcuate supports, a body frame composed of head, seat and foot

sections, arcs carried by the head and foot sections, a bed frame including inverted side channelled members having openings to admit the arcs of the head section, and receiving the arcuate supports from beneath, two sets of rollers in each side member against which the respective arcs bear, means carried by the side members engaging the arcuate supports for shifting the bed frame and its carried parts, means carried by the side members engaging the head section arc for independently adjusting the head section, links by which said section is pivotally attached to the bed frame permitting yielding upon said adjustment of the head section, means carried by said links engaging with the foot section arcs for independently adjusting the foot section, and similar means associated with each of the various bed frames and section adjusting means for clamping them in the adjusted position.

13. A bed including a bed frame having parallel inverted side channel members provided with openings adjacent to one end, a bed frame comprising head, seat and foot sections hinged together, supporting arcs for the head section passing through said openings in the side members and having a series of slots provided therein, said slots being narrower than the width of the arc to leave continuous side portions providing tracks; similarly formed but smaller arcs carried by the foot section, means inside of the side members including rollers upon which the head section arcs bear, links pivotally connecting the foot section with the bed frame, a shaft extending across the bed frame through the links carrying gears with which the foot section arcs engage, a shaft extending across the bed frame and through the side members carrying ears engaging the head section arcs, similar means on each of the shafts permitting turning to independently adjust the head and foot sections changing the contour of the body frame, a sleeve on each of the shafts, and means on each of the shafts for clamping the side members and links respectively against said sleeve to fix the adjustments of the body frame.

CHARLES A. HAWK.