

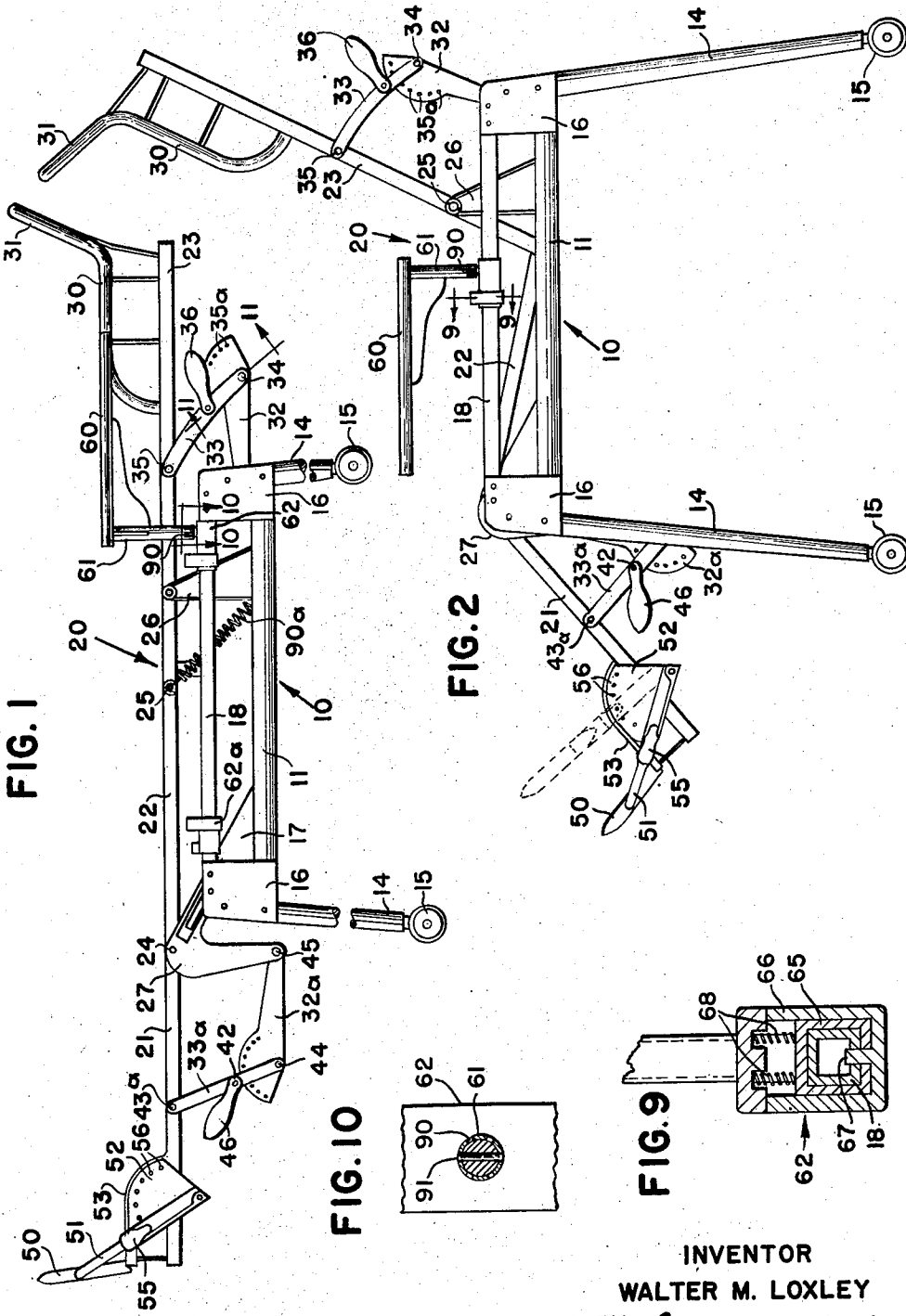
June 12, 1951

W. M. LOXLEY
INVALID BED

2,556,591

Filed Feb. 6, 1946

3 Sheets-Sheet 1



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FIG. 3

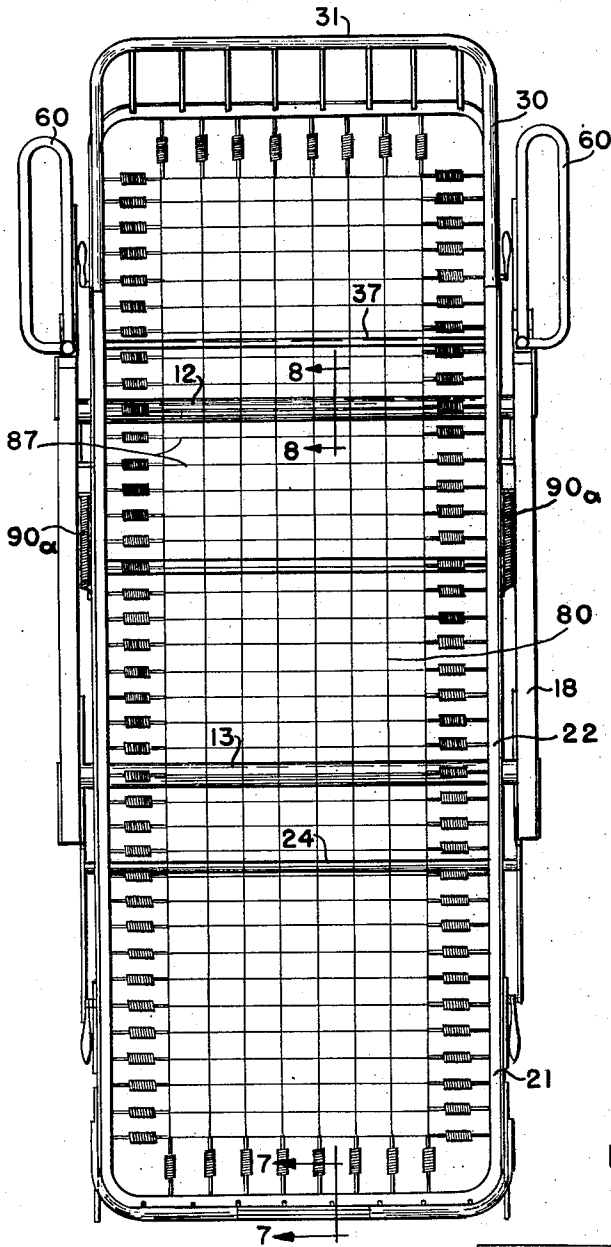


FIG. 11

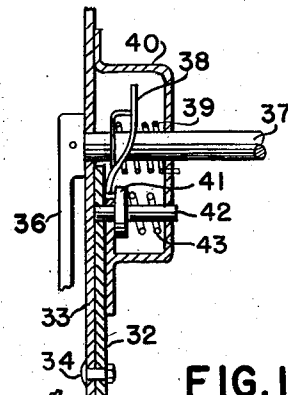


FIG. 12

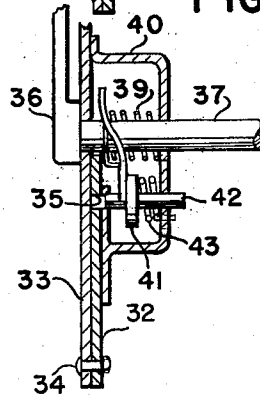


FIG. 13

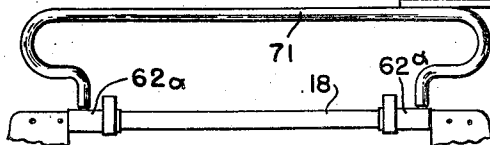
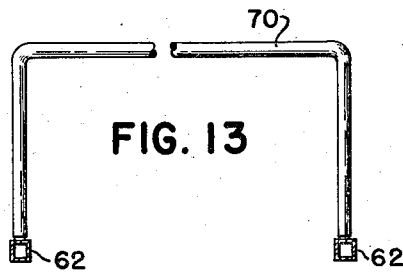


FIG. 14

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3 Claims. (Cl. 5-67)

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This invention relates to beds, particularly to beds for invalid persons for placing them in various positions.

An object of the invention is to provide an improved construction for an invalid bed to obtain various adjustments of the bed for comfortably supporting persons who are ill or who are invalid.

Another object of the invention is to provide an invalid bed of an improved type that is adapted to place an invalid person in a sitting position, and wherein the component parts of the bed are automatically placed angularly relative to one another upon moving the component parts of the bed from a reclining position to a sitting position thereof for obtaining a more comfortable sitting position for the patient.

Another object of the invention is to provide an invalid bed in accordance with the foregoing object wherein the component parts of the bed can be adjusted relative to one another after it has been placed in a sitting position to change the angularity between the component parts to give the most comfortable position to a patient.

Further objects and advantages will become apparent from the drawings and the following description.

In the drawings:

Figure 1 is a side elevational view of the invalid bed of this invention illustrated in the reclining position thereof.

Figure 2 is a side elevational view of the invalid bed shown in Figure 1 but illustrating the same disposed in a sitting position.

Figure 3 is a top plan view of the invalid bed of this invention.

Figure 4 is a side elevational view of a portion of the mechanism for arranging the component parts of the bed at predetermined angles relative to one another, and shown in position with the bed in reclining position.

Figure 5 is a side elevational view similar to Figure 4 but showing the position of the elements with the bed disposed in sitting position.

Figure 6 is a vertical cross-sectional view taken along line 6-6 of Figure 4, illustrating the track and guide for controlling the movement of the folding mechanism of the bed.

Figure 7 is a vertical cross-sectional view taken along line 7-7 of Figure 3, illustrating the construction of the adjustable foot-rest for the bed.

Figure 8 is a vertical cross-sectional view taken substantially along line 8-8 of Figure 3 but showing the bed-springs as positioned with the bed frame in sitting position to illustrate the

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mechanism for maintaining a relatively square corner at the fold in the bed.

Figure 9 is a vertical cross-sectional view taken along line 9-9 of Figure 2 illustrating the latch for holding the arm rest in position on the frame of the bed.

Figure 10 is a horizontal cross-sectional view taken along line 10-10 of Figure 1 showing an adjusting mechanism for an arm rest of the bed.

Figure 11 is a cross-sectional view taken substantially along line 11-11 of Figure 1 illustrating one of the latch-operating mechanisms which hold the component parts of the bed in predetermined positions.

Figure 12 is a cross-sectional view similar to Figure 11 showing the latch-operating mechanism in position for withdrawing the latching bolt thereof.

Figure 13 is an elevational view of a cross-bar that can be inserted in the arm rest holders for extending transversely across the bed.

Figure 14 is an elevational view of a side rail that can be supported in a pair of arm rest holders on the frame of the bed.

In this invention, the bed consists of a pedestal or frame 10 consisting of a pair of longitudinally extending tubular members 11 that are joined by a pair of transversely extending tubular members 12 and 13. This frame also is provided with the legs 14 having rollers 15 on the end thereof. The tubular frame members 11, at the juncture between the legs 14 and the frame member 11, are provided with a pair of side plates 16 and 17 at the front and rear corners of the frame 10 that are joined by a square tubular member 18.

The main bed frame 20 consists of three component parts, a foot section 21, a middle section 22, and a head section 23 that are pivotally connected together. The parts 21 and 22 are pivotally connected by means of a rod 24 extending transversely between the frame members, and the frame members 22 and 23 are pivotally connected together by pivot pins 25 extending through the respective frame members. The frame member 23 is pivotally mounted upon the pedestal 10 by means of a pair of side brackets 26, one each of which is secured to each tubular frame member 11 of the pedestal 10.

The frame members 21 and 22, pivotally connected together by the rod 24, are also pivotally connected upon a pair of substantially V-shaped brackets 27 which are slidably connected to the pedestal 10 in a manner more clearly illustrated in Figures 4, 5 and 6.

One of the brackets 21 is provided along each side of the bed-frame, and since both brackets are identical, except for being arranged on the left and right-hand sides of the pedestal 10 respectively, only one of the brackets will be described, which is that located on the right-hand side of the pedestal 10.

The bracket 27 carries a channel-shaped member 28 secured thereto in any suitable manner which slides upon a guide member 29 secured to the side plate 17 attached to the pedestal 10. The guide member 29 is disposed at a downwardly inclined angle toward the head end of the bed so that when the bed is moved from the reclining position, as illustrated in Figure 1, to the sitting position as illustrated in Figure 2, the bracket 27 will move downwardly and toward the head end of the bed simultaneously.

When the bed is in the sitting position, as illustrated in Figure 2, it will be noted that the portion 22 of the bed forms the seat portion and is inclined downwardly toward the head end of the bed to make for a more restful position when a patient is sitting in the bed. Also, it will be noted that the pivot 25 between the sections 22 and 23 of the bed 20 is disposed to one side of the frame pivot so that the weight of a person on the bed will be thrown in a direction downwardly, tending to aid the folding of the bed at this pivot 25, and thereby relieve the energy required of an operator to lift a person to a sitting position. The movement downwardly of the pivot 25 causes the bracket 27 and the section 21 of the bed to be drawn rearwardly to place the joint between the sections 21 and 22 at the proper knee position for a patient and to lower the same sufficiently to maintain an inclined angle of the seat portion 22 for obtaining a restful sitting position of the elements of the bed.

The head end of the bed 23, namely, the section 23 thereof, is provided with a frame structure 30 around the edge thereof which prevents a pillow from sliding off the end of the bed, and has an upstanding portion 31 which may form a back-rest in case a patient desires to sit up in bed while it is retained in a reclining position.

The section 23 of the bed 20 is adjusted to reclining position, shown in Figure 1, and held therein, by means of a bracket 32 pivotally mounted upon a pedestal 10, and particularly upon the inner side plate extending between the members 11 and 18 of the pedestal.

The bracket 32 has an arm 33 pivotally carried thereon by means of a pin 34, and the arm 33 is pivotally connected to the section 23 of the bed by means of the pin 35. The bracket 32 also has a series of holes 35a arranged in an arc thereon, adapted to receive a locking pin that is operated by the handle 36. The pin operated by the handle 36 is located in one of the holes 35a to hold the jack-knife mechanism consisting of the members 32 and 33 in rigid position and thereby hold the section 23 in position relative to the remaining sections 22 and 21.

The locking pin that is operated by the handle 36 is more clearly illustrated in Figures 11 and 12. As shown herein, the handle 36 is carried upon a rod 37 that extends transversely across the bed to a similar operating mechanism on the opposite side thereof. The rod 37 carries a cam member 38 secured thereto for rotation therewith upon actuation of the handle 36. A torsion spring 39 is provided around the rod 37 and has one end thereof fastened to the cam 38 and the opposite end to an enclosure 40 that encloses the cam 38.

The cam 38 is adapted to engage a shoulder or collar 41 provided on the locking pin 42 that enters one of the holes 35 in the member 32 of the jack-knife mechanism which consists of the members 32 and 33. Normally, the compression spring 43 holds the locking-pin 42 in position in the holes selected.

Rotation of the cam 38 moves the high point thereof into engagement with the shoulder 41 to remove the pin 42 from the hole 35 and thereby allow movement of the section 23 of the bed for raising or lowering of the same, or for adjusting the position of the bed when it is placed in sitting position as illustrated in Fig. 2. The rod 37 simultaneously actuates the mechanism on both sides of the bed through means of similar cam arrangements as just described. The released position of the locking mechanism is shown in Fig. 12. If for some reason the handle 36 should be released at any time during the raising or lowering of the section 23 of the bed, the torsion spring 39 will automatically place the cam in the position indicated in Fig. 11 to cause the pin 42 to drop into one of the holes 35 and thereby prevent the section 23 of the bed from falling completely.

The foot section 21 of the bed 20 is adjustably held in position by a similar jack-knife mechanism, as just described, consisting of the members 32a and 33a and a corresponding locking mechanism 42a. The member 33a is pivoted to the section 21 by means of a pin 43a and to the member 32 by the pin 44, the member 32a being pivoted to the V-shaped bracket 27 by means of a pin 45. One such mechanism is placed on each side of the section 21 of the bed and operated simultaneously by a handle 46 on either side of the bed.

An adjustable foot-rest is provided for the bed and consists of a foot-plate 50 pivotally carried upon a pair of rods 51 extending along opposite sides of the bed 20, the rods 51 being pivotally mounted to the plates 52 positioned adjacent opposite sides of the frame section 21 and the foot frame portion 53. The foot-plate 50 is provided with an arcuately shaped member 54 adapted to be placed upon the foot frame 53 when the foot-rest is in its extreme position at the end of the bed section 21.

The foot-plate 50 may be adjusted to various positions, such as the position illustrated in dotted lines in Figure 2, by releasing a latching mechanism 55 of any suitable type to allow movement of the arm or rod 51 and causing the latching mechanism to engage any one of the holes 56 in the plates 52 for holding the foot-plate 50 in any selected position.

A pair of arm rests 60 is provided on opposite sides of the bed, these arm rests each being provided with a post 61 adapted to fit upon a stud carried upon the arm rest holder 62 that is mounted upon the square rod 18 of the pedestal 10. The post 61 is provided with a series of slots 90, see Fig. 10, around the lower edge thereof adapted to fit upon a pin 91 extending through the stud in the holder 62 to allow for positioning the arm-rest 60 in any angular position relative to the bed 20. The arm rest holder 62 is adapted to be adjusted longitudinally along the rod 18 to position the arm rest 60 at any position along the bed such as that illustrated in Fig. 1 or that illustrated in Fig. 2. The arm rests 60 can be used for holding serving trays of various types either for convenience of the patient attendants or for the convenience of the patient.

The arm rest holder 62 consists of a frame 65 slidable upon the tube 18. The frame 65 carries a reciprocating member 66 having a pin 67 therein adapted to enter holes in the bottom edge of the tube 18, the pin 67 being held in position by the compression springs 68, thereby holding the arm rest holder 62 in any selected position along the length of the tube 18.

In Fig. 13 there is illustrated a U-shaped bar 70 that is adapted to extend transversely across the bed 20 between the holder members 62 positioned upon each of the rods 18 extending longitudinally of the pedestal 10. This bar 70 is for the purpose of providing a grasping-bar for patients to aid in raising themselves in bed.

If desired, a side-rail can be provided for the bed 20 in the manner illustrated in Fig. 14 wherein the bar 71 is adapted to be supported by a pair of carrier members 62a mounted upon the bar 18, the rail 71 extending longitudinally along the side of the bed 20. In this case a serving tray or arm-rest 72 may be carried by the bar 71.

When the three sections 21, 22 and 23 of the bed 20 are moved from the flat position illustrated in Fig. 1 to the angular position illustrated in Fig. 2, the springs 80 of the bed 20 tend to straighten out across the pivot joints indicated at 24 and 25, in the manner illustrated in Fig. 8 shown by the dotted line 80a. If this condition was allowed to exist an uncomfortable condition is developed at the juncture between the sections 21, 22 and 23. To avoid this condition, particularly at the juncture 25 between the sections 22 and 23, an angle bar 85 is secured between the side frames of the section 23. A series of tension springs 86 extend between the angle bar 85 and a transversely extending wire 87 of the spring 80, thus continuously pulling the wire 87 downwardly so that the spring 80 is forced to follow substantially the contour indicated in full lines in Fig. 8. The arrangement thus provides a relatively square corner at the juncture between the sections 22 and 23.

The rod 24 that extends transversely across the bed 20 and forms the pivot for the sections 21 and 22 passes beneath the spring 80 as illustrated in Fig. 3. Thus, when the sections 21 and 22 are positioned angularly to one another, as illustrated in Fig. 2, the spring 80 passing over the bar 24 will be prevented from forming a large arc at this point by the arm 24. Thus, it is possible in the bed of this invention to obtain a substantially chair-like effect of the bed when it is positioned as illustrated in Fig. 2.

A pair of springs 90a extends between the pivot 25 between the sections 22 and 23 and the tube 11 of the pedestal 10 to aid in rotating the section 23 about the pivot formed by the brackets 26 when the bed is moved from the flat position illustrated in Fig. 1 to the angular position illustrated in Fig. 2.

While the apparatus disclosed and described herein constitutes a preferred form of the invention, yet it is to be understood that the apparatus is capable of mechanical alteration without departing from the spirit of the invention, and that all such modifications as fall within the scope of the appended claims are intended to be included herein.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a bed, the combination of, a pedestal, a sectional bed-frame adjustably supported upon said pedestal, said bed-frame comprising a head

section, a foot section and a middle section connected together end to end by hinge connections, means on said pedestal providing a fulcrum for said head section and connected thereto between its head end and the pivotal connection thereof to the middle section, fixed guide means on said pedestal for said middle section, a V-shaped bracket on said middle section having one limb thereof provided with guide means cooperating with the said fixed guide means to permit longitudinal movement of said middle section toward said head section and angular positioning thereof upon a downwardly inclined angle toward said head section upon raising of said head section, a link pivotally connected to the other limb of said V-shaped bracket, a second link pivotally connected to said first link and to said foot section, and means extending between said links to hold them in angularly adjusted positions.

2. In a bed, the combination of, a pedestal, a sectional bed-frame adjustably supported upon said pedestal, said bed-frame comprising a head section, a foot section and a middle section connected together end to end by hinge connections, means on said pedestal providing a fulcrum for said head section and connected thereto between its head end and the hinge connection thereof to the middle section, fixed guide means on said pedestal adjacent each side of said middle section at one end thereof, an inverted V-shaped bracket pivotally connected to each side of said middle section at the hinge connection between the middle section and the foot section, guide means on one limb of each of said brackets cooperating with said fixed guide means to support one end of said middle section and permit longitudinal movement thereof toward said head section and angular positioning thereof at a downwardly inclined angle toward said head section aligned between the hinge connections between the middle section and the head and foot sections upon raising of said head section, and means connected between the other limb of each of said V-shaped brackets and said foot section to angularly adjust the relationship between the foot section and the middle section.

3. In a bed, the combination of, a pedestal, a sectional bed-frame adjustably supported upon said pedestal, said bed-frame comprising a head section, a foot section and a middle section connected together end to end by hinge connections, means on said pedestal providing a fulcrum for said head section and connected thereto between its head end and the hinge connection thereof to the middle section, fixed guide means on said pedestal adjacent each side of said middle section at one end thereof, an inverted V-shaped bracket pivotally connected to each side of said middle section at the hinge connection between the middle section and the foot section, guide means on one limb of said each of said brackets cooperating with said fixed guide means to support one end of said middle section and permit longitudinal movement thereof toward said head section and angular positioning thereof at a downwardly inclined angle toward said head section aligned between the hinge connections between the middle section and the head and foot sections upon raising of said head section, means connected between the other limb of each of said V-shaped brackets and said foot section to angularly adjust the relationship between the foot section and the middle section, a foot-board, link means pivotally connecting the foot-board on said foot section for hinging the same there-

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upon, and means for adjusting the position of said link means and thereby said foot-board between the extremities of said foot section.

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