

May 26, 1959

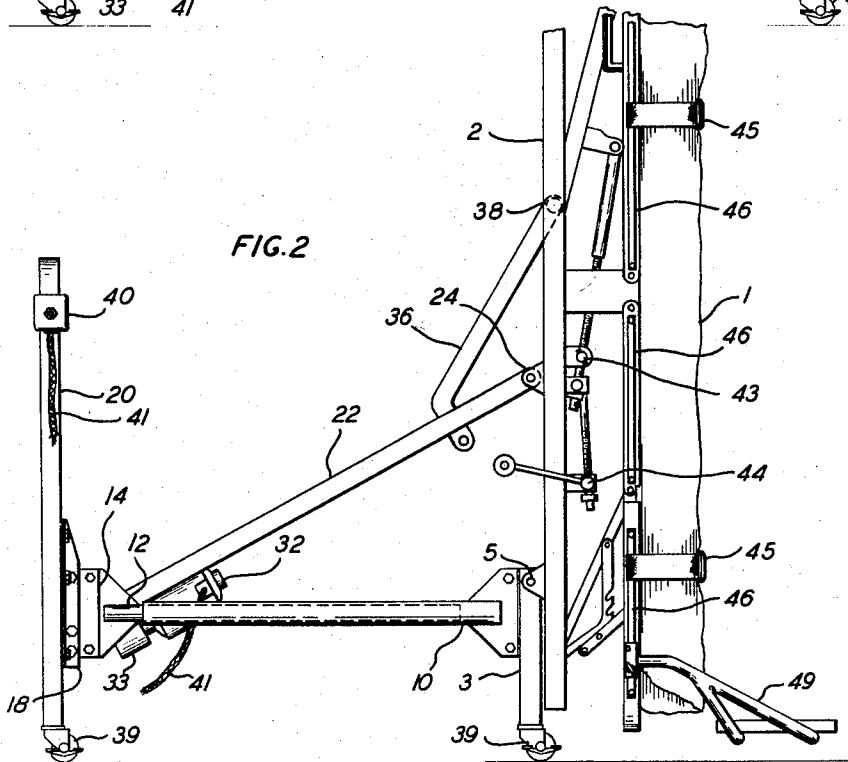
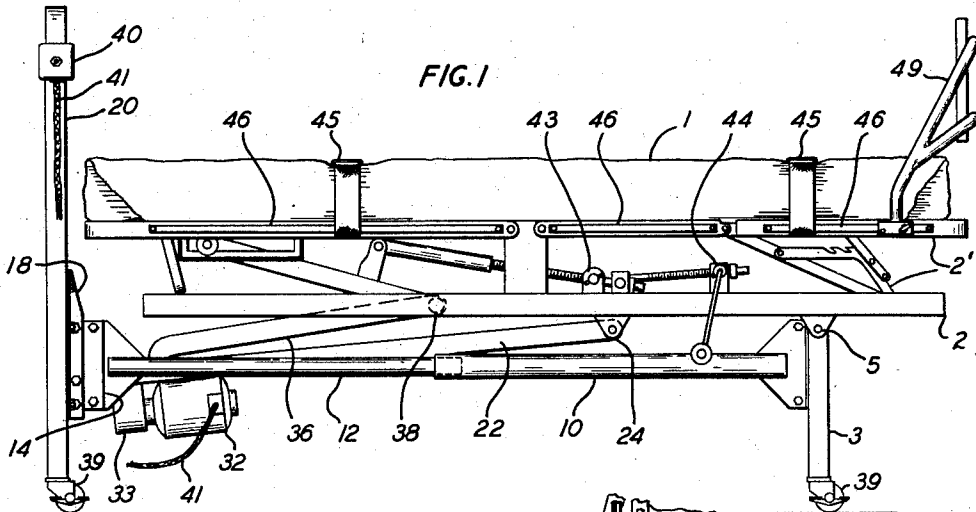
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HOSPITAL BED

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4 Sheets-Sheet 1



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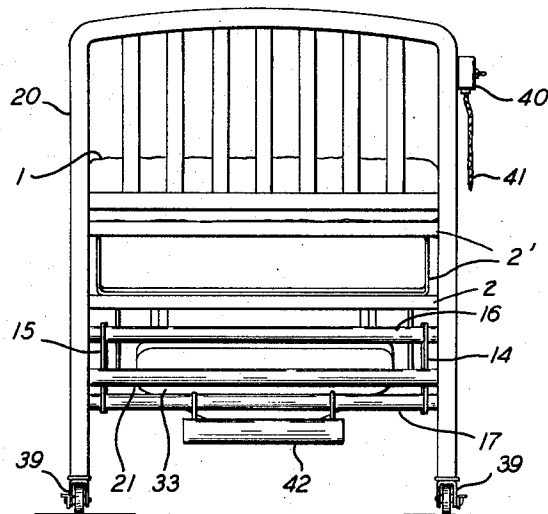


FIG. 3

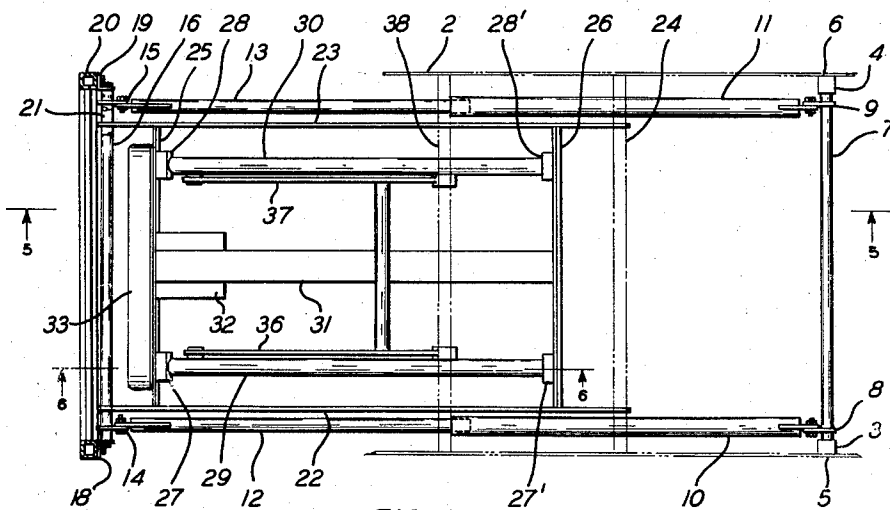


FIG. 4

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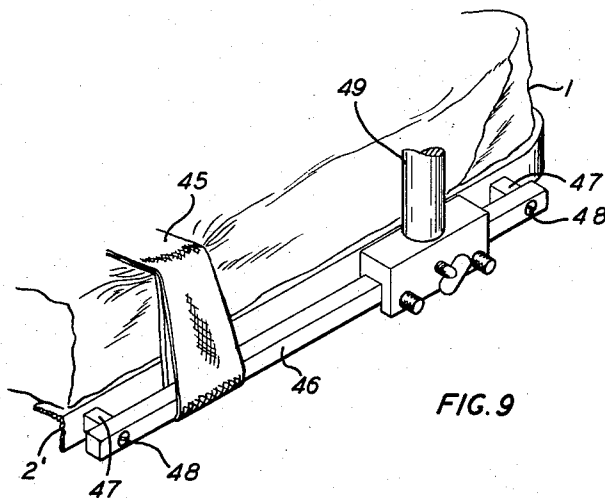
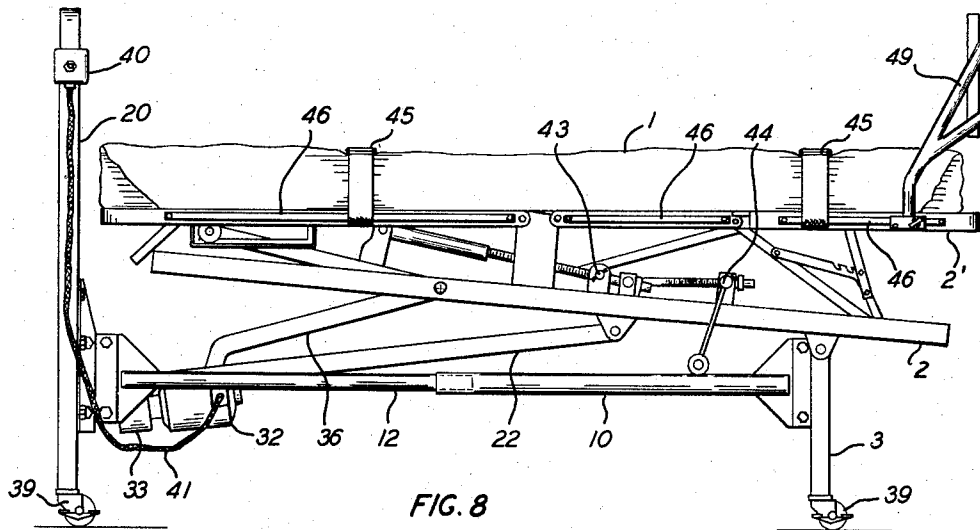
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HOSPITAL BED

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9 Claims. (Cl. 5-62)

This invention relates to an improvement in hospital beds and one of its objects is to provide a hospital bed that not only may be adjusted to place a patient in various reclined positions, but also in a substantially vertical position.

Another object of this invention is to permit a patient to make his own adjustment of the bed.

Still another object is to provide a safe, rugged and adaptable structure that may be readily placed in its desired position.

At present, hospital beds are available which may, by manual or mechanical means, be raised or lowered and in some cases, angularly disposed to permit treatment or the relaxing of a patient. Other orthopedic appliances, such as tilt beds are employed to place a patient in a substantially erect position. Our invention has embodied in one bed structure the advantages heretofore found separately in beds and in tilting tables. It has added certain other advantages which will be apparent from the description which follows:

Our invention is described in the accompanying drawing in which:

Figure 1 is a side view of the bed in a normal position ready for general use.

Figure 2 is a side view similar to Figure 1, except that the bed is tilted up a full 80 degrees.

Figure 3 is a back view of the bed of Figure 1.

Figure 4 is a top or plan view of only the tilting mechanism in a normal position.

Figure 5 is a sectional view of Figure 4 taken along line 5-5.

Figure 6 is a sectional view of Figure 4 taken along line 6-6 to show the power unit of the tilting mechanism.

Figure 7 is a partial bottom view of the drive unit shown in Figure 6.

Figure 8 is a view showing one of the many positions by using the tilting mechanism. This particular view shows how it is possible to raise the working height of the bed.

Figure 9 is a pictorial view showing one of several accessory rails and its use.

The following is a description of the construction and operation of the bed.

The bed is made up of a standard mattress 1, and the conventional hospital type articulated spring assembly 2', supported on a rectangular base frame 2, pivotally attached to a foot piece at pivots 5 and 6. Legs 3 and 4 on casters 39 are held in spaced relationship by tie bars 7 to form the rigid frame constituting the foot piece. Tubular members 10 and 11 are rigidly secured to brackets 8 and 9, attached to tie bar 7. Slidable within tubular members 10 and 11 are rods 12 and 13 which are rigidly secured at one end to brackets 14 and 15 attached to tie bars 16 and 17.

Tie bars 16 and 17 and pivot rod 21 are members of the headboard assembly 20, attached thereto by angles 18 and 19.

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Pivotally attached to pivot rod 21 are bars 22 and 23, which are also pivotally mounted on pivot rod 24 of spring base frame 2. Bars 22 and 23, with cross bars 25 and 26, form a pivotable carriage which carries the tilting mechanism.

The tilting mechanism consists of the following.

Bearing blocks 27, 27', 28 and 28' carried on cross bars 25 and 26. Longitudinally slotted tubes 29 and 30 extend between the bearing blocks. Drive screws 34 are journaled in the bearing blocks and turn in slotted tubes 29 and 30. Drive screws 34 are driven by gears in gear box 33 to which are connected reversible motor 32. Motor 23 is mounted on support member 31 running between cross bars 25 and 26. Riding on each drive screw 34 is a threaded follower block 35, extending through the slots of tubes 29 and 30, and pivotally connected with push bars 36 and 37, the other end of each such bar being pivotally mounted on pivot rod 38 of spring base frame 2.

This is the basic construction of the bed. The operation is as follows.

The operator first locks the forward or rear caster 39, depending on available room and most convenient arrangement, then manipulates switch 40 which may be removably attached to head board 20 as shown. Cable 41 connects switch 40 to motor 32.

To tilt spring base frame 2 toward a vertical position, reversible motor 32 is energized and threaded follower blocks 35, riding on the drive screws 34, push bars 36 and 37 against pivot bar 38. Since the distance between pivot rod 21 and pivot rod 24 is held constant by rigid bars 22 and 23, push bars 36 and 37 pivot on pivot rod 38, moving spring base frame 2 in an arc about pivot rod 24. Since pivots 5 and 6 are a fixed distance from pivot rod 24, base frame 2 pushes legs 3 and 4 toward head board 20, causing telescoping of rod 12 in tubular member 10 and telescoping of rod 13 in tubular member 11, thus maintaining alignment between the foot and the head of the bed.

In order to maintain the balance of the bed when it is in vertical position, with a patient in it, a counterweight 42 is hung from tie bar 17 of the headboard assembly 20.

In order to obtain various positions of the bed, the tilting mechanism may be stopped anywhere in its cycle and by further adjustment of threaded shafts 43 and 44 of articulated spring assembly 2', as is done in hospital beds presently in use, almost any position can be obtained. As an example, the entire level of the bed can be raised, as shown in Figure 8.

To prevent the mattress from falling off in the vertical position and to attach any of several attachments, such as the footboard 49, accessory bars 46 held to the spring frame by spacers 47 and screws 48 are provided. Belts 45 are used to hold the mattress securely in place.

Many changes in detail may be made in the structure shown without departing from the scope of this invention. Manual instead of motorized power may be used; casters may be dispensed with on either the foot piece legs or headboard assembly legs; structural changes may be made and other modifications employed. It is not intended, therefore, to limit such scope by the description hereinbefore given.

What we claim is:

1. A hospital bed including a head piece supported on two legs; a foot piece comprising a rigid vertical frame supported on two legs mounted on casters; a pair of telescoping members adjustably connecting the head piece with the foot piece to form a substantially rectangular frame therewith; a rigid bed spring frame pivotally supported atop the foot piece; a drive screw journaled at one end in a member pivotally connected with the head

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piece and at the other end in a member pivotally connected to the rigid bed spring frame at a point between the head end of the bed spring and the line about which the frame is pivotable; a follower block threaded to the drive screw and pivotally linked with the said rigid spring frame; and means for rotating the drive screw.

2. A hospital bed including a head piece supported on two legs; a foot piece comprising a rigid vertical frame supported on two legs mounted on casters; a pair of telescoping members adjustably connecting the head piece with the foot piece to form a substantially rectangular frame therewith; a rigid bed spring frame pivotally supported atop the foot piece; a drive screw journaled at each end on a member pivotally connected at one end with the head piece and pivotally connected at its other end to the said rigid bed spring frame at a point between the head end of the bed spring frame and the line about which the frame is pivotable; a follower block threaded to the drive screw and pivotally linked with the said rigid bed spring frame; and means for rotating the drive screw.

3. A hospital bed including a head piece supported on two legs; a foot piece comprising a rigid vertical frame supported on two legs mounted on casters; a pair of telescoping members adjustably connecting the head piece with the foot piece to form a substantially rectangular frame therewith; a rigid bed spring frame pivotally supported atop the foot piece; a drive screw journaled at each end on a member pivotally connected at one end with the head piece and pivotally connected at its other end to the said rigid bed spring frame at a point between the bed spring frame head end and the line about which the frame is pivotable; a follower block threaded to the drive screw and pivotally linked with the said rigid bed spring frame at a point between the bed spring frame head end and the drive screw supporting member's pivot connection to the said spring frame; and means for rotating the drive screw.

4. A hospital bed including a headpiece supported on two legs connected in adjustable spaced relationship with a foot piece supported on legs mounted on casters; the rigid base frame of an articulated hospital bed spring pivotally supported atop the foot piece a distance from the foot end of the rigid base frame less than the height of the foot piece; a pair of drive screws lengthwise of the bed journaled on a rigid carriage, one end of which is pivotally mounted on the head piece and the other end of which is pivotally mounted on the said rigid base frame of the bed spring between the spring base frame head end and its pivot connection with the foot piece; a follower block threaded to each drive screw and pivotally linked with the said rigid base frame of the bed spring between the head end of said base frame and the point at which the said carriage is pivotally connected; and means for rotating each drive screw.

5. A hospital bed including a head piece supported on two legs; a foot piece comprising two legs mounted on casters, rigidly connected in spaced relationship to each other; a member fixed at right angles to each leg of the foot piece adapted to receive in telescoping engagement a member correspondingly fixed on the opposite leg of the head piece; the rigid base frame of an articulated hospital bed spring pivotally supported on the upper ends of each leg of the foot piece a distance from the foot end of the rigid base frame less than the length of said legs; a pair of drive screws lengthwise of the bed journaled within a rigid carriage, one end of which is pivotally mounted on the head piece and the other end of which is pivotally mounted on the said rigid base frame of the bed spring between the spring base frame head end and its pivot connection with the legs of the foot piece; a follower block threaded to each drive screw and pivotally linked with the said rigid base frame of the bed spring between the head end of said base frame and point at which the said

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carriage is pivotally connected therewith; and means for rotating each drive screw.

6. A hospital bed including a head piece supported on two legs; a foot piece comprising two legs mounted on casters, rigidly connected in spaced relationship to each other; a tubular member fixed at right angles to each leg of the foot piece adapted to receive in telescoping engagement a tubular member correspondingly fixed on the opposite leg of the head piece; the rigid base frame of an articulated hospital bed spring pivotally supported on top of the legs of the foot piece a distance from the foot end of the rigid base frame less than the height of said legs above the floor; a pair of parallel spaced longitudinally slotted tubular members of equal length supported on a rigid carriage, one end of which is pivotally mounted on the head piece; and the other end of which is pivotally mounted on the said rigid base frame of the bed spring between the spring base frame head end and its pivot connection with the legs of the foot piece; a drive screw journaled at each end within each of said slotted tubular members; a follower block threaded to each drive screw and extending outward of the slot and pivotally linked with the said rigid base frame of the bed spring between the head end of said base frame and the point at which the said carriage is pivotally connected therewith; and means for rotating each drive screw.

7. A hospital bed including a head piece supported on two legs; a foot piece comprising two legs mounted on casters, rigidly connected in spaced relationship to each other; a tubular member fixed at right angles to each leg of the foot piece adapted to receive in telescoping engagement a tubular member correspondingly fixed on the opposite leg of the head piece; the rigid base frame of an articulated hospital bed spring pivotally supported on top of the legs of the foot piece a distance from the foot end of the rigid base frame less than the height of said legs above the floor; a pair of parallel spaced longitudinally slotted tubular members of equal length supported on a rigid carriage, one end of which is pivotally mounted on a rod secured to and parallel with the head piece, the other end of which is pivotally mounted on a rod secured to the said rigid base frame of the bed spring between the spring base frame head end and its pivot connection with the legs of the foot piece; a drive screw journaled at each end within each of said slotted tubular members; a follower block threaded to each drive screw and extending outward of the slot and pivotally linked with a rod secured to the said rigid base frame of the bed spring between the head end of said base frame and the rod thereon to which the said carriage is pivotally connected; and means for rotating each drive screw.

8. A hospital bed including a head piece supported on two legs; a foot piece comprising two legs mounted on casters, rigidly connected in spaced relationship to each other by tie rods; a tubular member fixed at right angles to each leg of the foot piece adapted to receive in telescoping engagement a tubular member correspondingly fixed on the opposite leg of the head piece; the rigid base frame of an articulated hospital bed spring pivotally supported on the upper tie rod of the foot piece a distance from the foot end of the rigid base frame less than the height of said tie rod above the floor; a pair of parallel spaced longitudinally slotted tubular members of equal length supported within a substantially rectangular rigid frame, one end of the frame pivotally mounted on a rod secured to and parallel with the head piece, the other end of the frame pivotally mounted on a rod secured to the said rigid base frame of the bed spring between the spring base frame head end and the upper tie rod of the foot piece; a drive screw journaled at each end within each of said slotted tubular members; a follower block threaded to each drive screw and extending outward of the slot and pivotally linked with a rod secured to the said rigid base frame of the bed spring between the head end of said base frame and the rod thereon to which the tubular

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members supporting rigid frame is pivotally connected; and means for rotating each drive screw.

9. A hospital bed including a head piece supported on two legs mounted on casters; a foot piece comprising two legs mounted on casters, rigidly connected in spaced relationship to each other; a tubular member fixed at right angles to each leg of the foot piece adapted to receive in telescoping engagement a tubular member correspondingly fixed on the opposite leg of the head piece; the rigid base frame of an articulated hospital bed spring pivotally supported on top of the legs of the foot piece a distance from the foot end of the rigid base frame less than the height of said legs above the floor; a pair of parallel spaced longitudinally slotted tubular members of equal length supported within a substantially rectangular rigid frame, one end of the frame pivotally mounted on a rod secured to and parallel with the head piece, the other end of the frame pivotally mounted on a rod secured to the said rigid base frame of the bed spring

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between the spring base frame head end and its pivot connections with the legs of the foot piece; a drive screw journaled at each end within each of said slotted tubular members; a follower block threaded to each drive screw and extending outward of the slot and pivotally linked with a rod secured to the said rigid base frame of the bed spring between the head end of said base frame and the rod thereon to which the tubular members supporting rigid frame is pivotally connected; and a motor operably connected with each drive screw.

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