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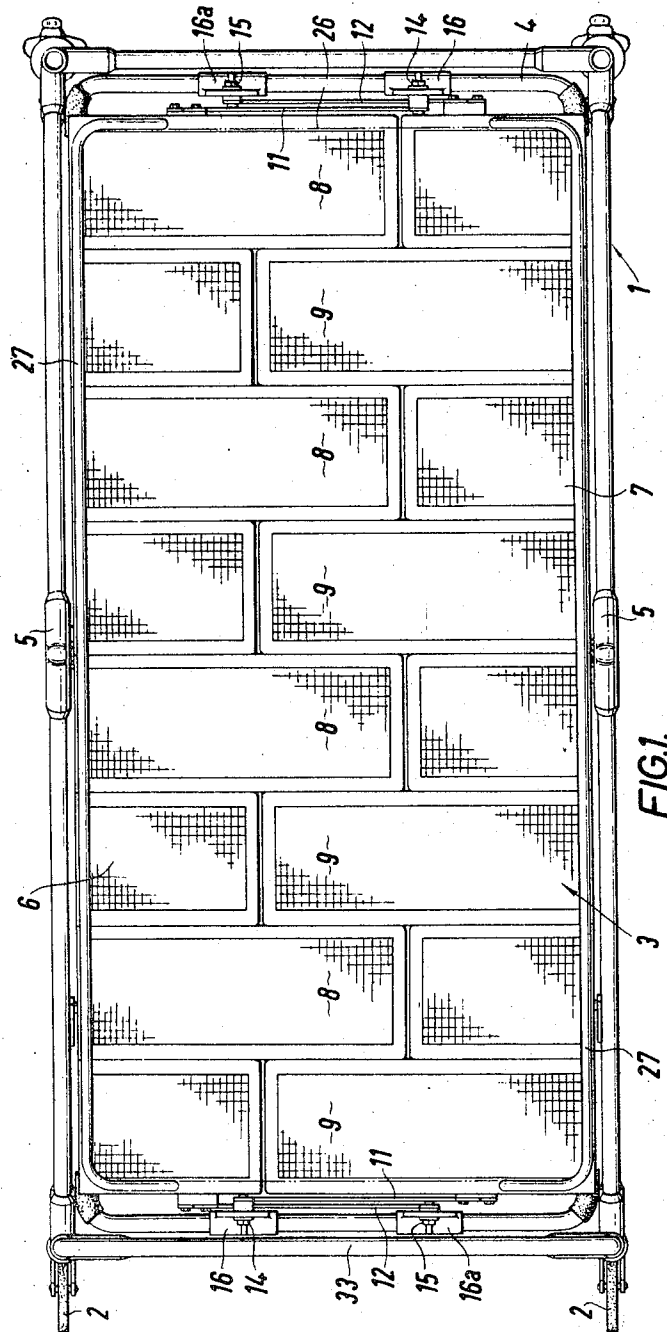
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3,300,793

HOSPITAL AND LIKE BEDS

Filed Jan. 4, 1966

5 Sheets-Sheet 1



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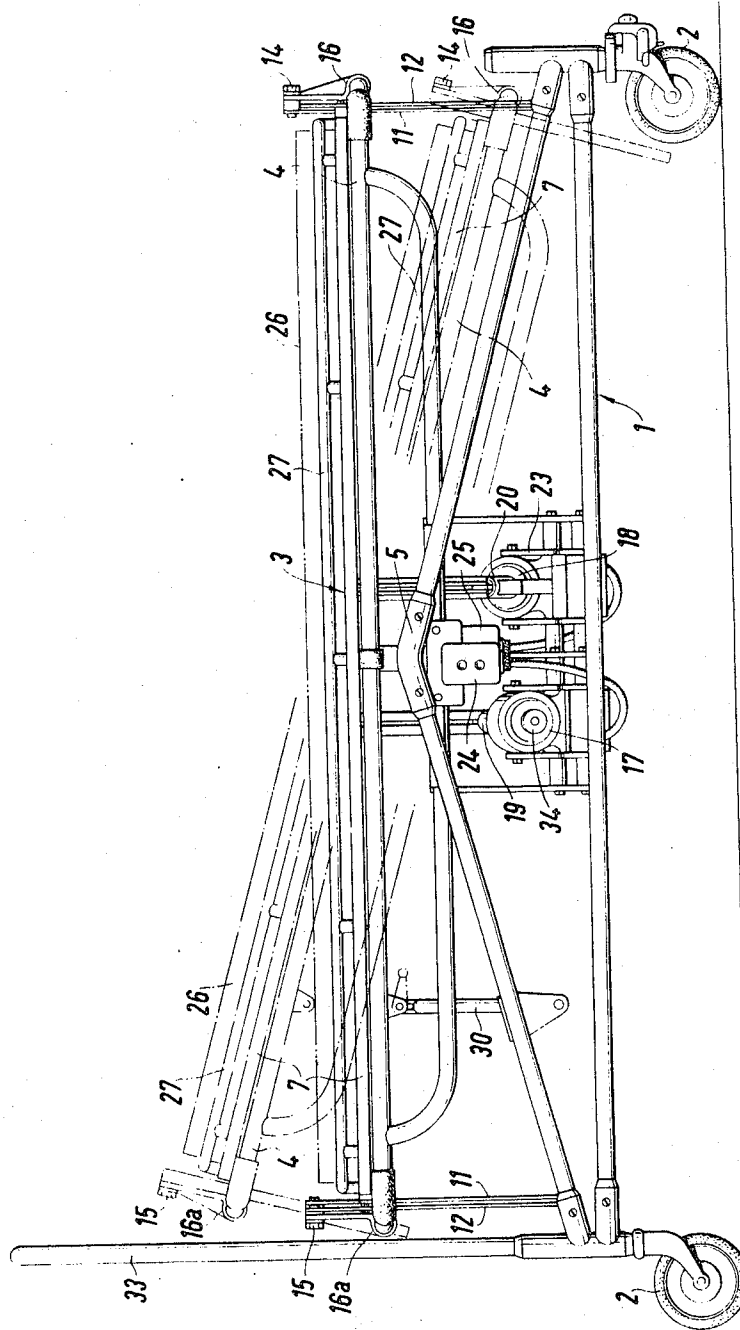


FIG. 2.

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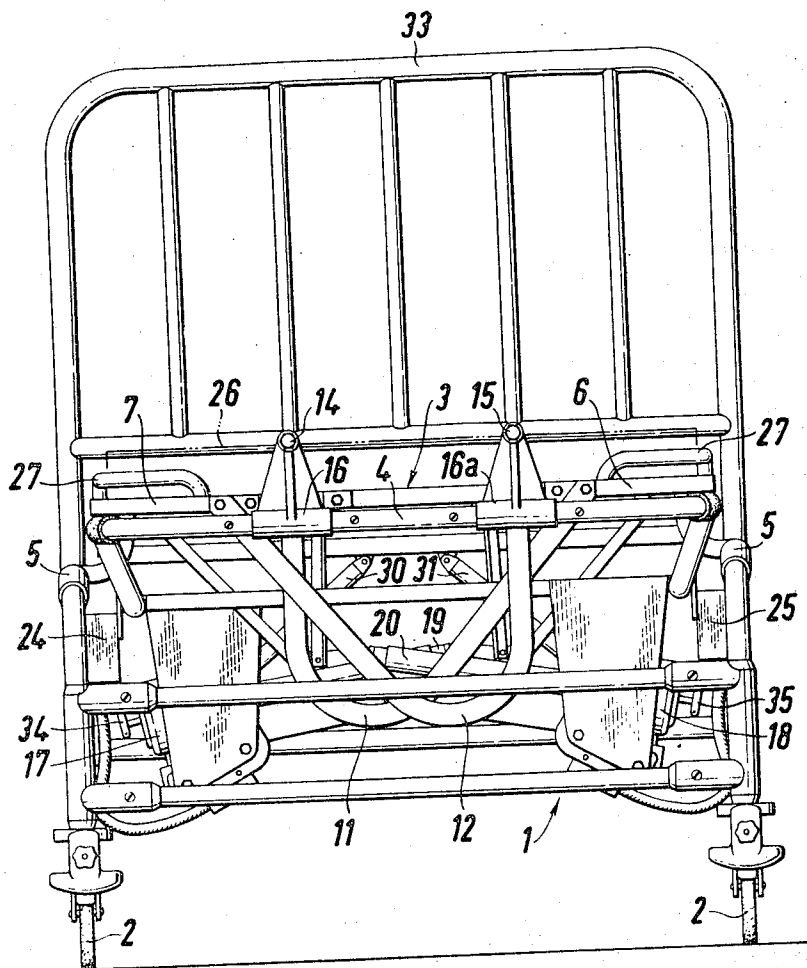


FIG. 3.

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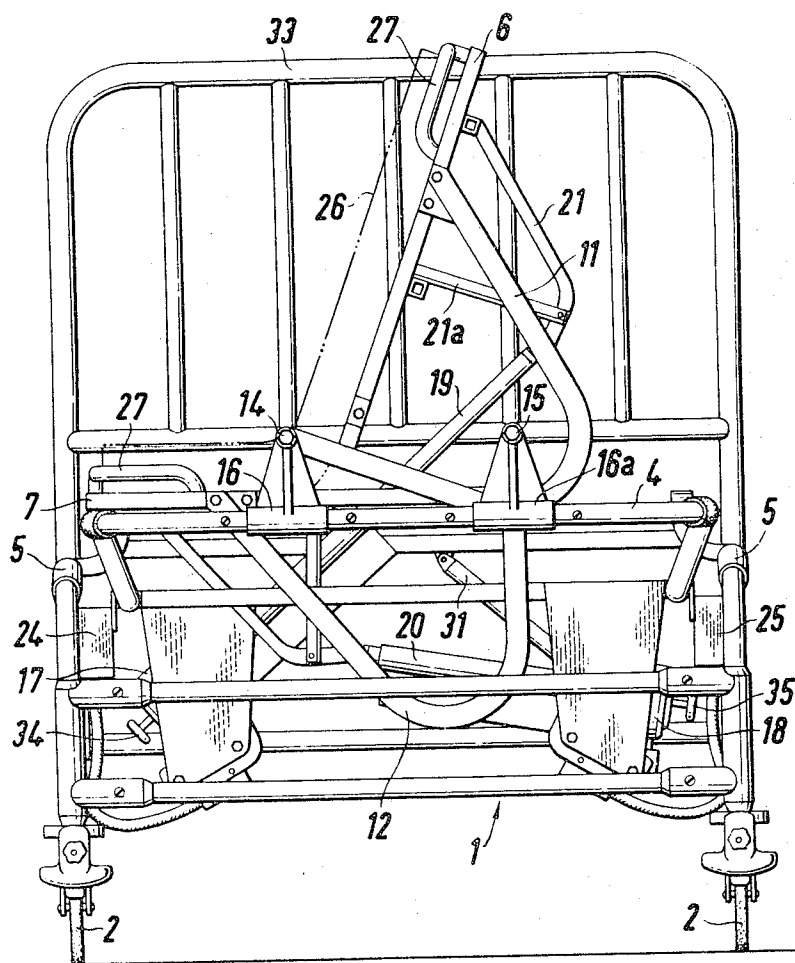


FIG. 4.

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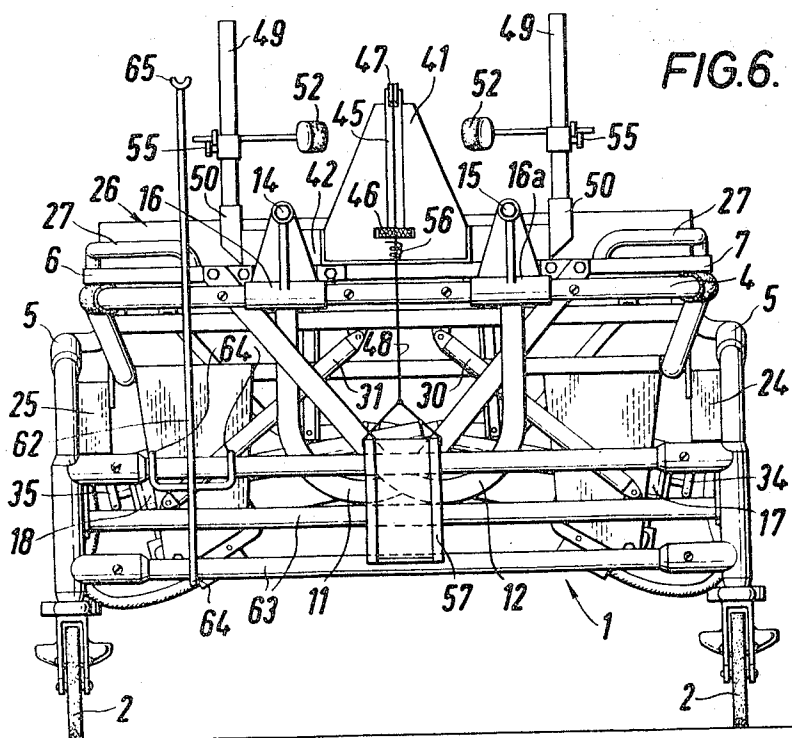
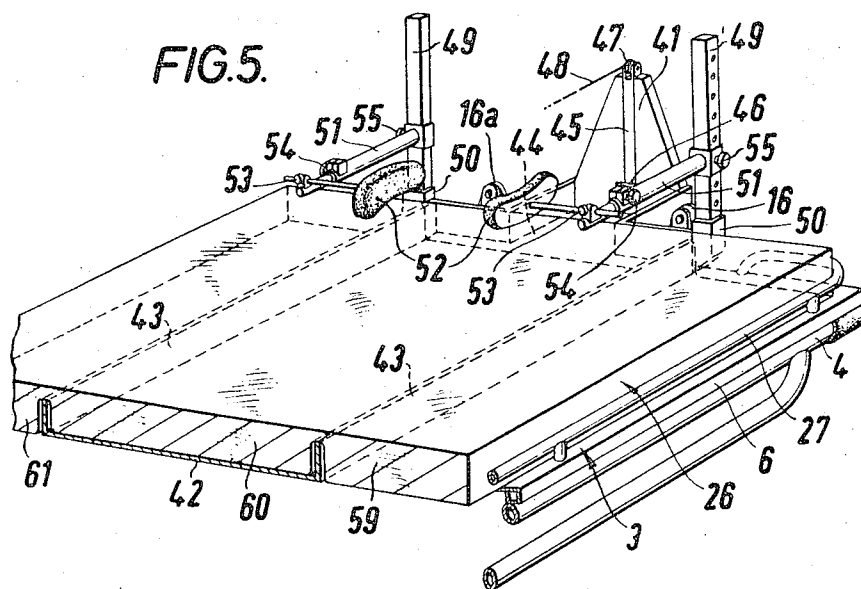
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HOSPITAL AND LIKE BEDS

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302/65; Dec. 17, 1965, 53,681/65
10 Claims. (Cl. 5—61)

This invention relates to hospital and like beds.

Difficulty has been experienced in turning paralysed or surgical patients who have to be turned relatively frequently, say every four hours. Particular difficulty has been found in turning patients suffering from spine or similar injuries where the torso must always be supported during any movement and whose bodies must remain in the same positions to prevent further injury. With this latter type of patient it has been found necessary to employ six persons for about twenty minutes to turn the patient from his back to his right or left side.

The present invention seeks to overcome this problem by providing a bed, the parts of which can be moved so as to cause the patient to be turned while maintaining support for the spine throughout.

According to the invention there is provided a hospital or like bed comprising a bed frame, a supporting structure carried by the bed frame and adapted to support a mattress or like article, the supporting structure being divided in a median longitudinal region into two normally co-planar parts at least one of which is hinged mounted so as to be movable relatively to the other, the hinge arrangement being off-set from the longitudinal center line of the supporting structure, the arrangement being such that a person lying in the center of the bed can be turned on his side by movement of one of the parts while his spine is supported at all times.

Preferably both parts of the structure are movable whereby the said person can be turned on either side by moving the appropriate part. The two parts of the supporting structure may be so constructed that when co-planar, each has portions extending transversely of the length of the bed into the other. Power operated actuating means may be provided for moving the parts of the supporting structure.

The invention also includes the provision of a traction device specially adapted for use with the bed.

One embodiment of the invention will now be described by way of example with reference to the accompanying drawings, in which:

FIGURE 1 is a plan view of a hospital or like bed in accordance with the invention;

FIGURE 2 is a side view of the bed of FIGURE 1 showing the tilting mechanism of the bed;

FIGURE 3 is an end view of the bed of FIGURE 1;

FIGURE 4 is an end view similar to FIGURE 3 but showing one part of the supporting structure in its raised position;

FIGURE 5 is a perspective view of the head traction unit for the bed; and

FIGURE 6 is an end view of the bed similar to FIGURE 3 but showing the head traction unit in position on the bed and taken from the opposite end of the bed.

Referring to FIGURES 1 to 4 of the drawings, a hospital orthopedic or like bed comprises a bed frame 1 of tubular construction mounted on four castors 2. The bed frame 1 carries a supporting structure 3 mounted on

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a sub frame 4 which sub frame is pivoted to the frame proper at 5 for a purpose to be described.

The supporting structure 3 is divided along the median region of the bed into two parts 6 and 7, the center part of the structure being formed by alternate projecting portions 8 and 9 projecting respectively from the part 6 and the part 7. The two parts 6 and 7, are hingedly connected to the frame 4 by members 11 and 12 positioned at each end of the structure 3 and which are pivoted at 14 and 15 to upstanding portions 16 and 16a of the sub frame 4. In this way the hinge arrangement is offset.

Each of the two parts 6 and 7 are movable to take up positions as shown with regard to the part 6 in FIGURE 4. For this purpose two electric motors 17 and 18 are provided, which drive screw jacks 19 and 20. The jacks 19 and 20 act on members 21, 21a, 22, 22a to raise the appropriate part 6 or 7. In order to take up the twisting movement on the motors, the motors are each pivotally mounted in a frame 23. Operation of the motors is controlled by means of control boxes 24 and 25 which are on each side of the bed frame 1.

The supporting structure 3 supports a mattress 26 as shown in chain lines in FIGURES 2 to 4. Rails 27 are provided on the structure for retaining it when one of the parts 6 or 7 is raised.

The supporting structure 3 is as previously mentioned, pivoted to the frame 1 at 5 to permit longitudinal tilting.

Tilting of the bed is controlled manually by means of a removable handle (shown chain dotted at 29 in FIGURE 2) insertable at either side of the bed. This operates a threaded rod (not shown) threaded oppositely at each end. This rod is engaged by nuts carried by arms 30 and 31 pivoted at their other ends to the bed frame 1. The arrangement is such that turning the threaded rod will bring together or move apart the nuts thus causing the arms 30 and 31 to move about their fixed pivots and raise or lower the appropriate end of the supporting structure 3 in relation to the bed frame 1. One tilted position of the structure 3 is indicated in chain dotted lines in FIGURE 2. It will be seen that in this way the tilting mechanism is entirely independent of the operation of the raising etc. of the parts 6 and 7 of the supporting structure 3.

Detachable bed ends are provided, one of which is shown at 33.

In order to ensure that the raising and lowering of the parts 6 and 7 of the supporting structure may be carried out even in the event of a power failure, manually operable knobs 34 and 35 are provided on the shafts of the motors 17 and 18.

FIGURES 5 and 6 show a traction device specially adapted for use with the bed. In these figures, a head traction unit is shown.

Referring to FIGURES 5 and 6, the head traction unit comprises a frame 41, and a base portion 42 in the form of a tray having side members 43. The tray is open at its end away from the frame 41 and has a narrow portion 44 in which the frame 41 is mounted. The frame is provided with an adjustable post 45 adjustable for height by means of a knurled knob 46 and is provided with a pulley 47 at its upper extremity over which passes a cord 48. The cord 48 is attached by means of the usual head caliper to the patient's head (not shown).

Two supports 49 are provided in sockets 50 on either side of the base portion 42 and these supports 49 carry arms 51 which in turn carry head supporting pads 52. The pads 52 are adjustable by means of adjusting mecha-

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nisms 53 and 54 on the arms 51 and each arm itself is adjustable on the supports 49 by means of mechanisms 55.

At the lower part of the frame 41, at the rear thereof, is provided a cord retaining member 56 in the form of a coiled wire. The weight carrier 57 is attached to the end of the cord 48 so as to provide the traction tension.

The traction device is located on a bed by means of the mattress 26 divided into three longitudinal sections 59, 60 and 61, as shown in FIGURE 5. The construction is such that the three sections of the mattress are joined at their upper portions only and the center portion 60 of the mattress is seated in the base member 42.

A cord post 62 is shown in FIGURE 6 supported on bed rails 63 by means of three hooks 64. This post is provided with a fork 65 at its upper extremity for a purpose to be described.

The operation of the head traction unit will now be described:

The person lying on the bed is attached by the traction caliper to the cord 48 and with his head clamped in the head supporting pads 52. Raising of one part 6 or 7 of the bed will cause the patient to turn on to his side. As the base 42 of the device is located purely by means of the mattress, the device will turn with the side being raised and will slide relative to the non-raised side where necessary.

To prevent difficulties arising due to engagement of the support sockets 50 with the bed frame, these are chamfered at 45° as shown. Without this chamfer proper sliding movement of the device on the non-raised side of the bed is prevented.

When the patient has been turned on his side, it may be desirable to lower the raised side of the bed while retaining the patient on his side. If the cord 48 was allowed to remain on the device, the cord would return with the device to its original position. To avoid this the cord may be transferred to the cord post 62 by detaching the cord from the cord retaining member 56 and lifting the cord off the pulley into the fork 65. It is of course also necessary to remove the pads 52 and their supports 49 and 51.

When it is desired to return the patient to his original position, the appropriate part 6 or 7 of the bed is raised and the cord 48 transferred back from the fork 65 to the pulley 47.

Various modifications can be made to the above described bed without departing from the scope of the invention. For example hydraulic operating means may replace the electric motors. The mattress may be constructed from a number of separate removable parts to permit access to a patient for X-ray, surgical and other purposes. Where it is undesirable to remove sections of the mattress or where it is desired to take X-ray photographs through the supporting structure, the appropriate parts of the structure may be made from plastics or other X-ray permeable material.

In an alternative construction, the projections 8 and 9 can be omitted, the gap between the parts 6 and 7 being covered by a flexible member. In this case a specially constructed mattress may be used consisting for example, of a plurality of longitudinal sections to provide adequate spinal support, for example being in the median region made up of a series of longitudinal cushions hinged together by a common overlay.

Modifications may also be made to the head traction unit. For example, the weight carrier 17 may be replaced by a spring balance, the spring thus providing the tension instead of the weights.

Where desired the pulley 47 may be replaced by a fork and the retaining member 56 could be replaced by any other suitable device such as a spring closed hook. A pulley may replace the fork 65 on the cord post 62.

A special transfer device could be provided for mechanically transferring the cord 48 from the pulley 47 to the fork 65.

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It will be understood that although the unit has been described as a head traction device it can equally well be used for other traction purposes such as leg traction or arm traction. In this case, of course, the pads 52 may be dispensed with.

I claim:

1. A hospital bed comprising:

a bed frame;

a supporting structure carried by said bed frame and adapted to support a mattress;

the supporting structure being divided in a median longitudinal region into two normally co-planar parts which are so constructed that, when they are co-planar, each has portions extending transversely of the length of the bed into the other;

said extending portions crossing the center line of said supporting structure, and being in said median region; the extending portions being hingedly mounted so as to be movable relatively to one another; and

hinge means offset from the longitudinal center line of the supporting structure, for enabling said two parts to be movable relative to each other, the arrangement being such that a person lying in the center of the bed can be turned on his side by movement of one of the parts while his spine is supported at all times.

2. A bed as defined in claim 1, and: power means for movement of said hinged parts.

3. A bed as defined in claim 1, and:

a screw jack connected with each of said hinged parts; and an electric motor for operating said screw jack.

4. A bed as defined in claim 3, and:

manual means for actuating said screw jack.

5. A bed as defined in claim 3, and:

a knob or handle on the motor shaft whereby the motor shaft can be turned by hand in the event of a power failure.

6. A bed as defined in claim 3, and:

means for tilting the supporting structure as a whole relative to said bed frame on a transverse axis.

7. A bed as defined in claim 3, and:

a mattress on said supporting structure, the mattress including outer surfaces and being split longitudinally into outer parts and a middle part joined at the surface of the mattress remote from said supporting structure, the middle portion of the mattress corresponding substantially to said median region.

8. A bed as defined in claim 7, and:

a traction unit supported on said median region of said supporting structure and being supported thereon in such manner that it will move with any of said hinged parts of said supporting structure, so as to maintain traction on the person in the bed while being turned.

9. A bed as defined in claim 8, wherein:

the traction unit is provided with a base member in the form of an open-ended tray in which said middle portion of said mattress rests, the traction unit being located thereby.

10. A bed as defined in claim 9, wherein:

the traction unit further comprises a frame having a top;

a base portion on the frame for supporting the device on the bed;

a traction cord;

means for applying traction tension to said cord;

a cord guide on the top of said frame for changing the direction of pull of said cord from the horizontal necessitated by the horizontal position of the person under traction, to a direction suitable for attachment to tension applying means; and

means for adjusting the height of said cord guide.

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