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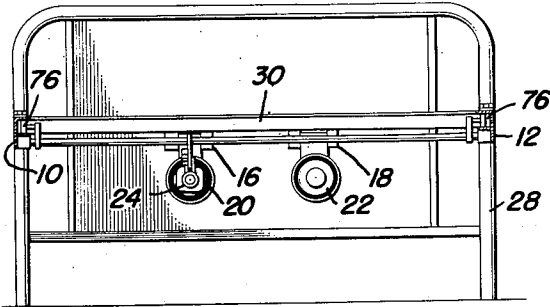
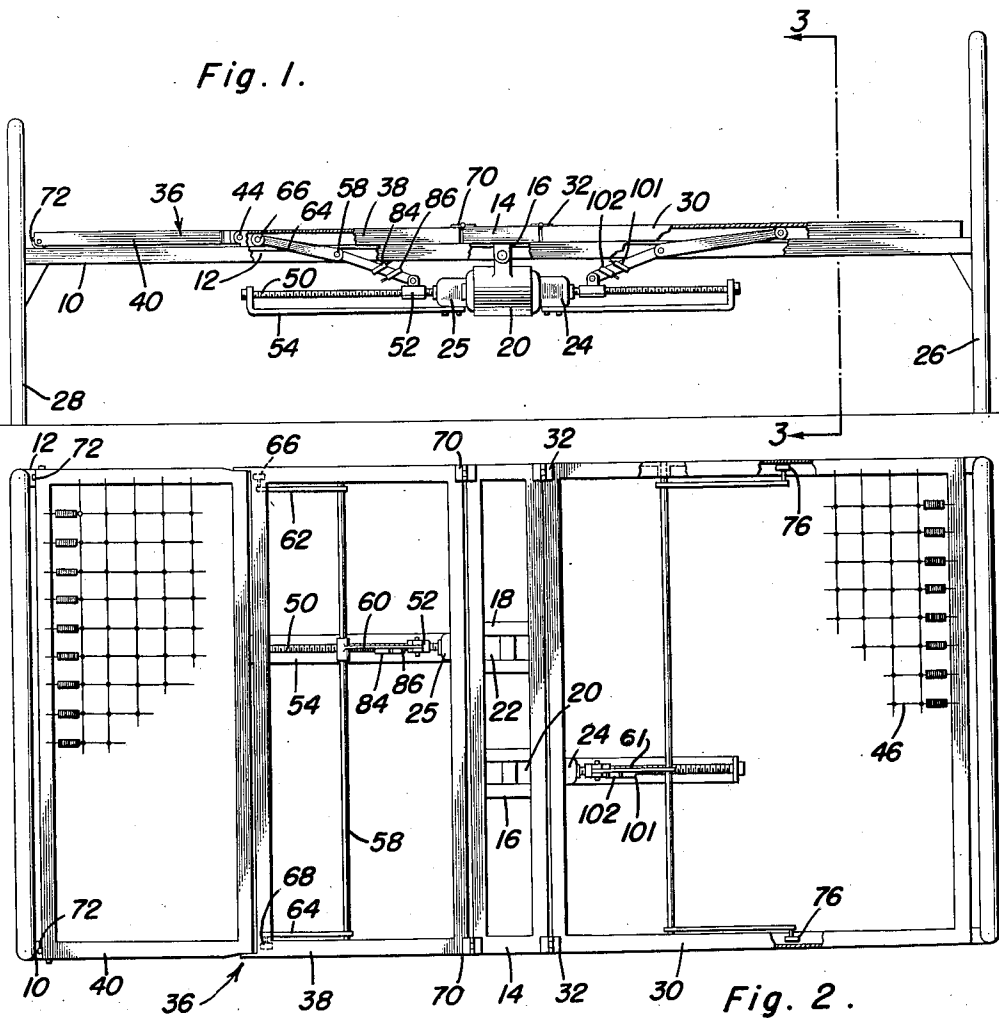
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2,631,300

POWER-OPERATED SECTIONAL INVALID BED

Filed June 27, 1949

2 SHEETS—SHEET 1



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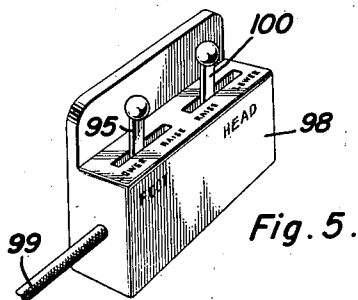
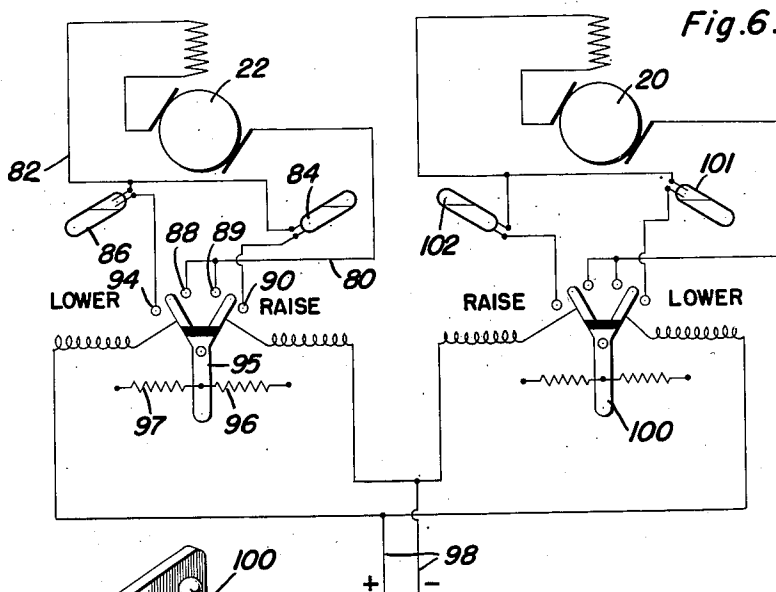
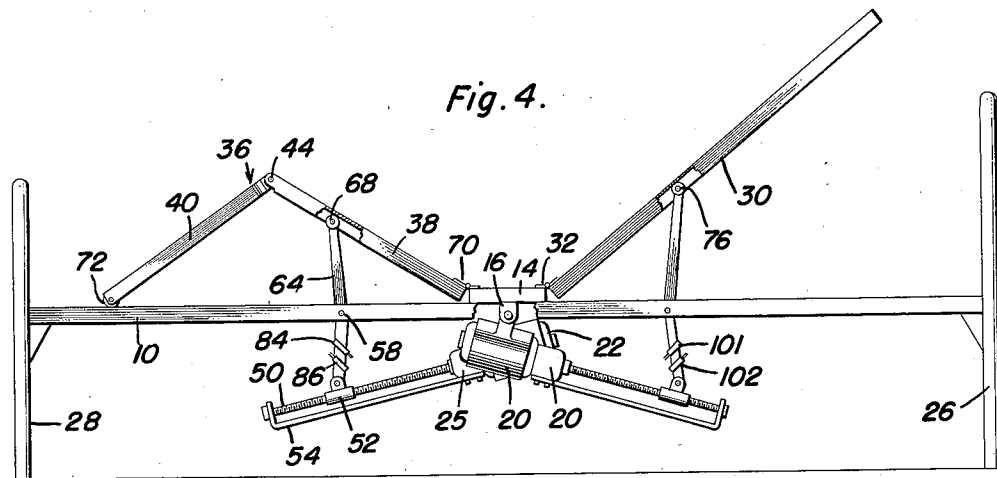
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POWER-OPERATED SECTIONAL INVALID BED

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2 SHEETS—SHEET 2



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UNITED STATES PATENT OFFICE

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POWER-OPERATED SECTIONAL INVALID
BED

Charles L. Murray, Waco, Tex.

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5 Claims. (Cl. 5-69)

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This invention relates to novel and useful improvements in hospital beds.

An object of this invention is to operate a hospital bed for adjustment of the mattress supporting section in such a manner that the patient is able to raise or lower the various sections in accordance with his prerogative by simply manipulating the operating members of a control switch unit conveniently located.

Another object of this invention is to prevent overriding of the sections by automatically breaking a circuit with one of the motors therein, rendering that section ineffectual for further movement in the harmful direction.

Ancillary objects and features of novelty will become apparent to those skilled in the art, in following the description of the preferred form of the invention, illustrated in the accompanying drawings, wherein:

Figure 1 is an elevational view of one form of the invention showing various operative elements in section;

Figure 2 is a plan view of the device shown in Figure 1, portions of the springs being broken away to illustrate the structure thereunder;

Figure 3 is an end view of the device shown in Figure 1;

Figure 4 is an elevational view of the device, showing the adjusted positions of the mattress supporting head and foot sections;

Figure 5 is a perspective view of the switch control unit which is adapted to be operated by the patient in the bed; and

Figure 6 is a wiring diagram showing schematically the arrangement of motors and switches which are used in connection with the invention.

The present invention relates to a hospital bed attachment having for its purpose the manual operation of the foot mattress supporting section and the head mattress supporting section by the patient in the bed without the necessity of calling someone to operate the said sections.

Illustrated in Figures 1 and 2, particularly, is a bed consisting of a frame which includes sides 10 and 12, respectively. These sides are angle iron in this instance and have a central transverse support 14 extending thereacross with brackets 16 and 18 respectively depending therefrom. These brackets pivotally mount the motors 20 and 22 which have reduction gear boxes 24 and 25 operatively connected therewith.

In order to support the frame at an elevated position, conventional legs 26 at the head of the bed and conventional legs 28 at the foot of the bed are provided in the usual manner.

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A mattress head supporting section 30 which is a substantially rectangular frame member is connected to the central support 14 by means of hinges 32. A foot mattress supporting section, generally indicated at 36, consists of two substantially equal size rectangular frames 38 and 40, respectively, which are connected together by means of a pivotal hinge 44. A webbing 46 is fixed to the said section 30 and a webbing is also fixed to the said section 36. The webbings may be of one continuous sheet or two individual sheets, one provided for the section 30 and the other provided for the section 36.

Extending from the reduction gear box 25 which is operatively connected with the motor 22 is a screw 50 having an internally threaded traveller 52 disposed thereon. The end of the screw 50 is supported in the bracket 54 which is fixed to the bottom of the reduction gearing box 25. Accordingly, upon operation of the motor 22, the screw 50 is rotated, thereby causing the traveller 52 to progress longitudinally on the screw. A transverse rod 58 is secured to the sides 10 and 12 of the frame and has the link 60 which is pivoted to the traveller 52, fixed thereto. Arms 62 and 64, respectively, having rollers 66 and 68 or other equivalent friction lessening means thereon are fixed for movement with the transverse rod 58. Accordingly, upon operation of the screw 50, the traveller 52 is operated axially of the screw, thereby pivoting the motor 22 and also, through the medium of the arms 62 and 64, operating the section 36 for raising and lowering about the hinges 70 which connect the section 36 with the center support 14. Rollers 72 are carried on suitable pins at the end of the said section 36 and are adapted to ride on the sides 10 and 12 of the frame.

An identical structure is used for the purpose of raising and lowering the head mattress supporting section 30, in this instance the rollers 76 engaging the bottom surface of the said section 30 along the longitudinal edges thereof for raising and permitting the patient together with the mattress to be lowered.

Referring to the wiring diagram of Figure 6, the motors 22 and 20 are shown to be of the reversing type. This is necessary in that the screw 50 for the motor 22 and the other screw for the motor 20 act as and are actually jacks (screw type) prohibiting return movement of the sections after they have been raised. Hence, it is essential that the motors be operated in the reverse direction so that the screws may be operated in the said reverse direction to allow lowering the sections. Suitable electric conductors

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are operatively connected with the motors. The motor 22 has a line 80 connected to one side thereof and a line 82 connected to the other side thereof. However, the line 82 has mercury switches 84 and 86 which are of the levelling type interposed therein. These mercury switches are carried by the link 60 so that the line 82 fails to conduct current to the motor after the section has reached the maximum desired height.

A pair of contacts 88 and 89 are at the terminal portion of the line 80, while the pair of contacts 90 and 94 are disposed at the ends of the line 82. By operating the switch arm 95 which is opposed in its operation by the opposing springs 96 and 97, the contacts 88 and 90 are bridged in order to operate the motor 22 in one direction or the contacts 94 and 89 are bridged in order to operate the motor in the opposite direction. The switch arms 95 always tend to return to the inoperative position, but because of the action of the springs 96 and 97.

The described switch is disposed in a unit and covered by a housing 98 which is conveniently located because of the length of wire 99 in any suitable position accessible to the patient.

The unit having the switches also contains another switch arm 100 which is used for the purpose of energizing the motor 20 through the mercury level switches 101 and 102 respectively which are carried by the link 61 which is connected with the section 30, serving the identical function as the mercury switches 84 and 86. The switch arm 100 is operated for the purpose of manipulating one part of the bed attachment, while the other switch arm 95 is used for the purpose of manipulating the other part thereof.

Having described the invention, what is claimed as new is:

1. In a hospital bed which includes a substantially horizontal frame and legs, a transverse support having a first and a second motor respectively, depending therefrom, each on a single pivotal mount, a first and second screw operated by said motors, a traveller disposed on each of said screws, a mattress supporting head section, means hingedly securing said head section to said transverse support, and a foot mattress supporting section, means hingedly securing said foot section to said transverse support, and means operatively connecting said sections with said travellers for hingedly moving said sections when said motors are operated.

2. In a hospital bed which includes a substantially horizontal frame and legs, a transverse support having a first and a second motor respectively, depending therefrom, each on a single pivotal mount, a first and second screw operated by said motors, a traveller disposed on each of said screws, a mattress supporting head section, means hingedly securing said head section to said transverse support, and a foot mattress supporting section, means hingedly securing said foot section to said transverse support, means operatively connecting said sections with said travellers for hingedly moving said sections when said

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motors are operated, a first switch, a second switch, conductors extending from said motors and having said switches therein, a housing having said switches therein and said conductors being of sufficient length to position the housing remote from the motors for patient operation, whereby said sections may be raised and lowered by the patient.

3. The combination of claim 2 and mercury switches carried by said means operatively connecting the travellers with the sections and interposed in said conductors for rendering said motors inoperative responsive to a predetermined angularity of said sections with respect to the horizontal.

4. In a hospital bed, a frame with legs, a transverse support carried by said frame, a motor having a screw operated thereby, means pivotally connecting said motor to said support and below said frame, means including a plurality of links and a traveller which is disposed on said screw for transferring rotative movement of said screw to swinging movement, a mattress supporting section hingedly secured to said support and operatively connected with said second-mentioned means whereby said section may be operated by said motor.

5. In a hospital bed, a frame with legs, a transverse support carried by said frame, a motor having a screw operated thereby, means pivotally connecting said motor to said support and below said frame, means including a plurality of links and a traveller which is disposed on said screw for transferring rotative movement of said screw to swinging movement, a mattress supporting section hingedly secured to said support and operatively connected with said second-mentioned means whereby said section may be operated by said motor, and said motor being of the reversing type, an electrical conductor extending therefrom, a switch housing connected with said conductor and having a switch therein, said conductor being flexible whereby said housing may be disposed in various places remote from the motor.

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