UNITED STATES PATENT OFFICE

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INVALID'S BED WITH MANUAL CONTROL

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7 Claims. (Cl. 5—67)

1 This invention relates to an invalid's bed with a manual control thereon, so that the patient himself can adjust the bed to either a reclining position or a sitting position, or any position between these two positions while lying on the bed.

An object of my invention is to provide a novel invalid's bed in which the patient himself while lying on the bed, can quickly and easily adjust the bed from a complete reclining position to a sitting position, as may be desired by the patient.

A feature of my invention resides in the means to counterbalance the weight of the moving portion of the bed and weight of the patient by means of springs so that little effort is necessary in adjusting the bed to its various positions.

Another feature of my invention is to provide a novel invalid's bed of the character stated, which is suitable in its various positions and will remain in any one of its adjusted positions until again moved by the patient.

Still another feature of my invention is to provide a novel invalid's bed of the character stated, in which the mattress will remain in position on its base even though the base is variously adjusted, and, further, the mattress will not impede the adjustment of the parts of the bed, and will automatically bend to conform with change to various positions.

Another feature of my invention is to provide a novel invalid's bed of the character stated, which is as low as a chair, and with many patients it is thereby not necessary for a nurse to lift the entire weight of the patient in placing the patient on the bed or removing same from the bed, as is the case when using a standard hospital bed.

Another feature of my invention is to provide a novel invalid's bed of the character stated, in which a patient is able to exercise his body by moving the bed up and down.

A further object of my invention is to provide a novel invalid's bed of the character stated, which is simple in construction and effective in operation.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

In the drawing

Figure 1 is a perspective view of my invalid's bed.

Figure 2 is a longitudinal sectional view of the same.

Figure 3 is a side elevation of my invalid's bed.

Figure 4 is a sectional view taken on line 4—4 of Figure 3.

Figure 5 is a fragmentary sectional view of the base and showing the gear construction.

Figure 6 is a fragmentary side view of the gears shown in Figure 5.

Figure 7 is a side elevation of a slightly modified form of invalid's bed.

Figure 8 is a sectional view taken on line s—s of Figure 7.

Figure 9 is a fragmentary longitudinal sectional view of the base of the bed showing the locking construction.

Figure 10 is a sectional view taken on line 10—10 of Figure 9.

Referring more particularly to the drawing, the numeral 1 indicates the base of the bed, which is substantially rectangular in shape, and is mounted on suitable rollers or casters 2. The base 1 includes a top member 3 and a front end member 4. These members form parts of the substantially rectangular hollow box-like structure of the base 1.

The bed platform 5 consists of the following sections:

A head section 6, an intermediate section 7, and a foot section 8. These sections are all hingedly connected together, substantially as shown. The foot section 8 also has a foot member 9 extending upwardly at right angles therefrom, and this acts to support the feet of the patient. A mattress 10 is preferably of the foam-rubber type and is attached to the platform 5. This mattress may be suitably attached to the sections of the platform 5, so that it will not slip endwise or sidewise when the bed is raised to a sitting position.

The foot section 8 is hingedly secured to the top member 3 of the base by means of the hinge 11. A plate 12 is fixedly secured to the top section 7 and this plate extends downwardly into the base 1 through a slot 13 in the top member 3 of the base. A second plate 14 is hingedly attached to the lower end of the plate 12 by the hinge 15 and to the foot section 8 by the hinge 16. The plate 14 projects through the end wall 4, which is slotted, as shown at 17, to permit movement of the plate 14 as the platform 5 moves into its various positions from reclining to sitting. Coil springs 18 are attached at one end to the plate 12 and at the other end to the base 1 so that a constant tension is exerted on the plate 12, which acts as a lever, the tension of the springs tending to urge the platform 5 to the sitting position, substantially as shown in Figure 2. The tension of the springs 18 are such that the weight
of the bed and patient is substantially balanced, permitting it to be moved to either sitting or reclining position with very little effort on the part of the patient.

The means to move the platform 5 to its various adjusted positions, is as follows:

A shaft 19 is journaled in the base 1 and extends horizontally through the base. A hand wheel 20 is mounted on the shaft 19 and may be affixed to either end of the shaft 19, as desired. A drive shaft 21 is journaled in a box 22, secured to the base 1. The shaft 21 is driven from the shaft 19 by the meshing gears 23. An operating shaft 24 extends transversely through the base 1 and is journaled in this base. The shaft 24 is driven by the shaft 21 through suitable gears 25. A lever arm 26 projects from the shaft 24 and is fixedly secured to this shaft. A link 27 extends from the member 26 to the plate 14 and is pivotally attached at each end, thus as the shaft 24 is rotated the arm 26 will be swung, thus moving the plates 14 and 12 to a position to recline the patient or to permit sitting posture.

There is a certain endwise movement of the intermediate member 7 and to permit this endwise movement, I may provide this section with rollers 28 which can move on the top member 3 of the base.

For the purpose of limiting both the upright and the reclining positions of the platform 5, I provide the following construction:

A spur gear 29 is driven from the shaft 19 by the gear 30 and a stop pin 31 is engaged by a pin 32 on the face of the gear 29, thus creating a limit stop for the bed. This stop arrangement is desirable when using worm gearing due to the large mechanical advantage in this type of drive.

In Figures 7 to 10, inclusive, I have shown a modified actuating means to incline the bed, as desired by the patient. This means includes a transversely extending shaft 32, which is journaled in the base 1. A lever arm 33 is mounted on either end of the shaft 32 and this lever arm includes a loop 34, which may be grasped by the patient and swung either forwardly or rearwardly, as desired, to tilt the platform of the bed. An arm 35 is fixedly mounted on the shaft 32 and this shaft is connected by means of a link 36 to the plate 14. Thus, as the shaft 32 is rotated manually by the patient, the link 36 will move the plates 14 and 12, thus tilting the platform of the bed, as desired by the patient.

In this construction, the bed will tilt very easily and the patient may thus exercise himself, if he desires. To hold the bed platform in its adjusted position, I provide a clamping means consisting of a metal strap 37, which is attached to the under side of the section 7. The strap 37 extends through a box 38 and a control rod 39 extends through this box. The rod 39 is rotated by means of a handle 40 on either or both ends of the rod. A worm 41 on the rod 39 threads into a brake shoe 42, positioned within the box 38. The brake shoe 42 engages the strap 37, as shown in Figure 10, thus clamping this strap and holding it against longitudinal movement, and thus holding the platform 5 of the bed in its adjusted position.

The construction shown in Figures 7 to 10, inclusive, also includes a limit stop construction, consisting of an arm 43 on the shaft 32, which engages a pin 44 to limit the throw of the arm 33.

The knee portion of the platform, which is the hinge between the sections 7 and 8, automatically lifts upwardly when the bed moves toward upright position. This prevents the patient from slipping down when raising to a sitting position. This upward or knee action is automatic in my bed and is best observed in Figure 2.

Having described my invention, I claim:

1. An invalid's bed including a base, a platform consisting of a head section, an intermediate section, and a foot section, hinges connecting adjacent sections, means hingedly mounting the foot section to the base, a plate projecting from the head section, a second plate hingedly connected at one end to the foot section, both of said plates being hingedly secured together, balance springs connected at one end to the first named plate and at the other end to the base, and manually operable means connected to said second plate to pivotally move the sections relative to said base.

2. An invalid's bed including a base, a platform consisting of a head section, an intermediate section, and a foot section, hinges connecting adjacent sections, means hingedly mounting the foot section to the base, a plate projecting from the head section, a second plate hingedly connected at one end to the foot section, both of said plates being hingedly secured together, balance springs connected at one end to the first named plate and at the other end to the base, a shaft journaled in said base, an arm on said shaft, a link extending from said arm to the second named plate, and manual means to rotate said shaft to pivotally move said sections relative to said base.

3. An invalid's bed including a base, a platform consisting of a head section, an intermediate section, and a foot section, hinges connecting adjacent sections, means hingedly mounting the foot section to the base, a plate projecting from the head section, a second plate hingedly connected at one end to the foot section, both of said plates being hingedly secured together, balance springs connected at one end to the first named plate and at the other end to the base, a shaft journaled in said base, an arm on said shaft, a link extending from said arm to the second named plate, and manual means to rotate said shaft to pivotally move said sections relative to said base.

4. An invalid's bed including a base, a platform consisting of a head section, an intermediate section, and a foot section, hinges connecting adjacent sections, means hingedly mounting the foot section to the base, a plate projecting from the head section, a second plate hingedly connected at one end to the foot section, both of said plates being hingedly secured together, balance springs connected at one end to the first named plate and at the other end to the base, a shaft journaled in said base, an arm on said shaft, a link extending from said arm to the second named plate, and manual means to rotate said shaft to pivotally move said sections relative to said base, said manually operable means including a shaft journaled in the base, a hand wheel on the last named shaft to rotate the same, and gear means connecting the last named shaft and the first named shaft.

5. An invalid's bed including a base, a platform consisting of a head section, an intermediate section, and a foot section, hinges connecting adjacent sections, means hingedly mounting the foot section to the base, a plate projecting from the head section, a second plate hingedly connected at one end to the foot section, both of said plates being hingedly secured together, balance springs connected at one end to the first named plate and at the other end to the base, a shaft journaled in said base, an arm on said shaft, a link extending from said arm to the second named plate, and manual means to rotate said shaft to pivotally move said sections relative to said base, said manually operable means comprising an arm projecting from said shaft, and a loop on said arm to be grasped by the invalid.
hingedly connected at one end to the first named plate and at the other to the foot section, balance springs connected at one end to the first named plate and at the other end to the base, a shaft journaled in said base, an arm projecting from the shaft, a link extending from said arm to the second named plate, and manually operable means to rotate said shaft.

5. An invalid's bed including a base, a platform consisting of a head section, an intermediate section, and a foot section, means hinging adjacent sections together, means hingedly mounting the foot section to the base, a plate projecting from the head section into the base, a second plate hingedly connected at one end to the first named plate and at the other to the foot section, balance springs connected at one end to the first named plate and at the other end to the base, a shaft journaled in said base, an arm projecting from the shaft, a link extending from said arm to the second named plate, and manually operable means to rotate said shaft, said manually operable means including an arm projecting from said shaft, and a loop on said arm.

6. An invalid's bed including a base, a platform consisting of a head section, an intermediate section, and a foot section, means hinging adjacent sections together, means hingedly mounting the foot section to the base, a plate projecting from the head section into the base, a second plate hingedly connected at one end to the first named plate and at the other to the foot section, balance springs connected at one end to the first named plate and at the other end to the base, a shaft journaled in said base, an arm projecting from the shaft, a link extending from said arm to the second named plate, and manually operable means to rotate said shaft.

REFERENCES CITED

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