C. H. DANFORTH.

INVALID BEDSTEAD.

APPLICATION FILED JUNE 6, 1918.

1,284,062.

Patented Nov. 5, 1918.

3 SHEETS—SHEET 1.

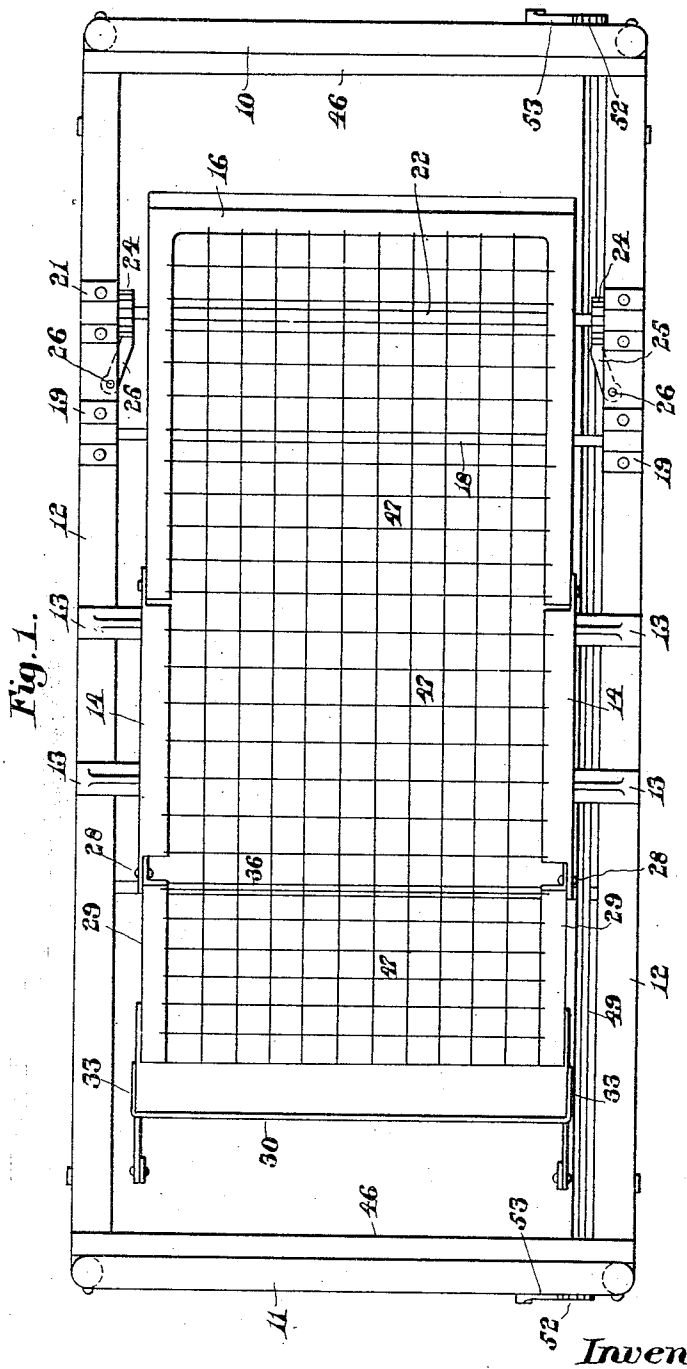


Fig. 1.

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3 SHEETS—SHEET 2.

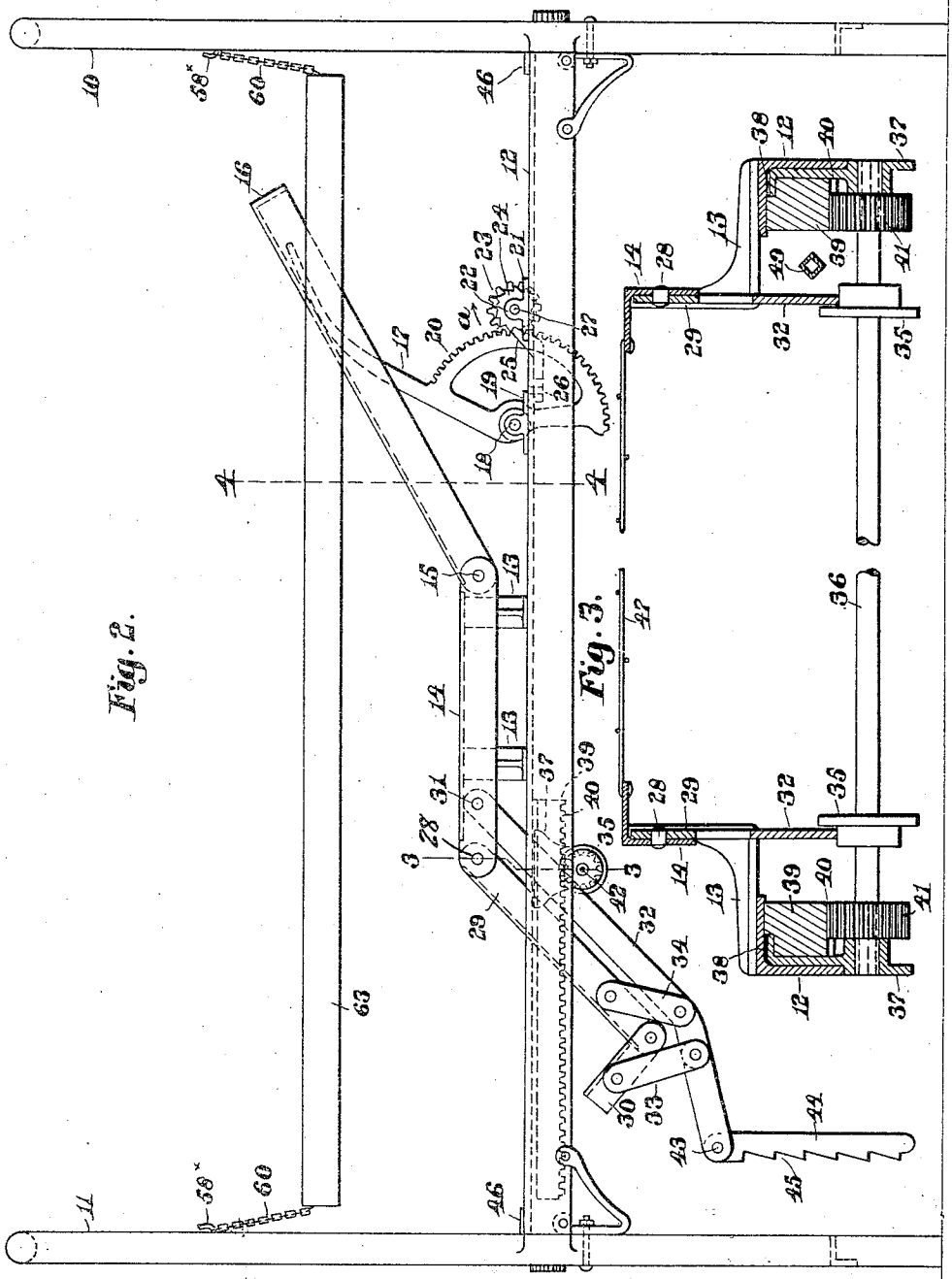


Fig. 2.

Fig. 3.

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3 SHEETS—SHEET 3.

Fig. 4.

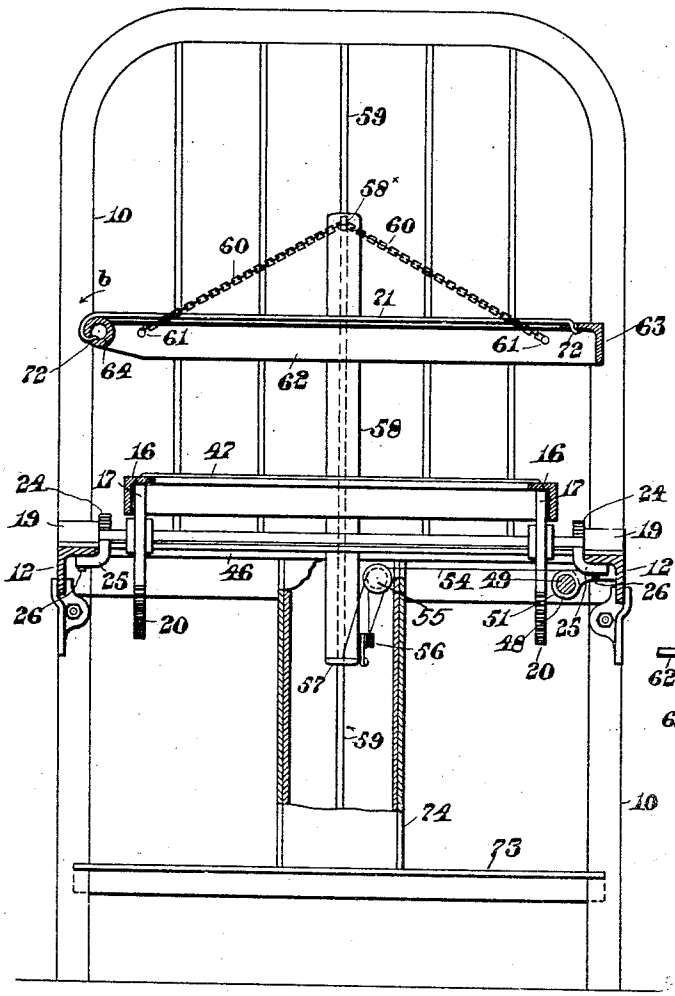


Fig. 11.

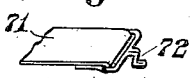


Fig. 5

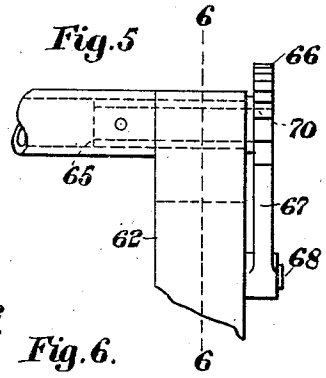


Fig. 6.

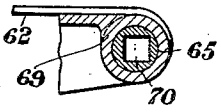


Fig. 7.

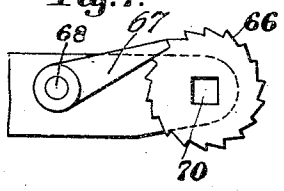


Fig. 8.

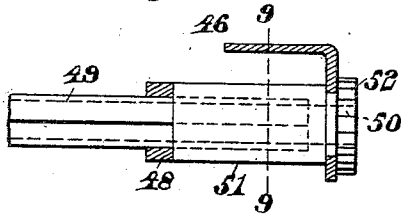


Fig. 9.

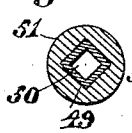
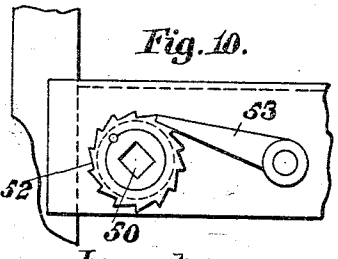


Fig. 10.



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UNITED STATES PATENT OFFICE.

CHARLES H. DANFORTH, OF DANVERS, MASSACHUSETTS.

INVALID-BEDSTEAD.

1,284,062. Specification of Letters Patent. Patented Nov. 5, 1918.

Original application filed March 19, 1918, Serial No. 223,865. Divided and this application filed June 6, 1918. Serial No. 239,899.

To all whom it may concern:

Be it known that I, CHARLES H. DANFORTH, a citizen of the United States of America, and a resident of Danvers, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Invalid-Bedsteads, of which the following is a specification.

This invention relates to bedsteads and particularly to that class of bedsteads which are used for invalids, the particular object of the invention being to provide a device of this character which may be adjusted so that the occupant may be moved into a sitting position and which is also provided with a supplemental body-supporting frame which may be raised and lowered relatively to the main bed frame.

Another object of the invention is to provide the leg-supporting section with a foot-rest which will be automatically moved into a position perpendicular to the leg-rest, whenever the latter is lowered into an inclined position.

A further object of the invention is to provide the main frame with oscillating cam-shaped arms coacting with the back-rest whereby said back-rest may be moved to any desired inclination and locked in adjusted position.

The invention consists in certain novel features of construction and arrangement of parts which will be fully understood by reference to the description of the drawings and to the claims to be hereinafter given.

The present invention is a division of another application of mine filed March 19, 1918, and numbered 223,865.

For the purpose of illustrating the invention one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described, except as required by the scope of the appended claims.

Of the drawings:

Figure 1 represents a plan of a bedstead embodying the principles of the present invention, with the body lifting frame removed.

Fig. 2 represents a side elevation of the same.

Fig. 3 represents a transverse section of the same on line 3, 3, on Fig. 2.

Fig. 4 represents a transverse section of the same on line 4, 4, on Fig. 2, with the spring horizontal.

Fig. 5 represents a detail in plan of a corner of the body-lifting frame and showing the means for stretching the transversely-disposed flexible bands thereof.

Fig. 6 represents a section thereof on line 6, 6, on Fig. 5.

Fig. 7 represents an end elevation of the same.

Fig. 8 represents a sectional detail of the means for elevating the body-lifting frame.

Fig. 9 represents a section of same on line 9, 9, on Fig. 8.

Fig. 10 represents an end elevation of the same, and

Fig. 11 represents a detail of the flexible band showing the engaging hook thereof.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 10 and 11 are respectively the head and foot frames of a bedstead connected together by the side rails 12 to which midway of their length are secured brackets 13 supporting the side bars 14.

To the head end of the side bars 14 there is pivoted at 15 a U-shaped frame 16 adapted to be moved about the pivot 15 into an inclined position as shown in Fig. 2 thereby forming a suitable back rest for the patient when placed in a reclining or sitting position.

The elevating of the back rest 16 is accomplished by cam-shaped arms 17 bearing against the underside of the frame 16, said arms being secured to a shaft 18 mounted in bearings 19 secured to the upper face of the side rails 12.

To the shaft 18 are also secured gear segments 20 which may be formed integral with the cam members 17 as shown in the drawings.

In bearings 21 secured to the upper face of the rails 12 is a revoluble shaft 22 having secured thereon gears 23 meshing with the gear segments 20.

When the shaft 22 is rotated in the direction of the arrow *a* on Fig. 2 of the drawings the cam arms 17 will raise the outer

ends of the U-shaped frame about the pivots 15 the weight of the body of the patient retaining the U-shaped frame 16 in contact with said arms 17 during the raising and lowering of said arms.

The shaft 22 has secured thereto, at opposite ends, ratchet wheels 24 with which pawls 25 are adapted to engage to prevent the accidental lowering of said U-shaped frame 16 when in its adjusted position.

The pawls 25 are pivoted at 26 to the side rails 12 and may be moved about said pivots to disengage said ratchets 24 when it is desired to lower the back-rest 16.

Each end of the shaft 22 is provided with a squared socket 27 adapted to receive the squared end of a crank by which rotation may be imparted to the shaft in the direction of the arrow *a* or by which the lowering of the back-rest 16 may be regulated.

When lowered the arms 17 retain the U-shaped back-rest 16 horizontal in alinement with the side bars 14.

To the foot end of the side bars 14 are pivoted at 28, bars 29, to the opposite ends of which is pivoted a U-shaped frame 30 forming a foot rest when the bars 29 are inclined downwardly as shown in Fig. 2 and the U-shaped member 30 has been moved perpendicularly thereto.

At 31 are pivoted to the side bars 14, the bent bars 32 having pivoted thereto near their outer ends the links 33, 34, the former being pivotally connected to the foot-rest 30 and the latter being pivotally connected to the bars 29.

When the bars 29, 30 are moved upwardly about their pivots 28, 31 the U-shaped member 30 and the bars 29 may all be brought into horizontal position in alinement with the side bars 14.

The position of the members 29, 30 is controlled by the position of the rollers 35 on which the bars 32 rest.

These rollers 35 are secured to a shaft 36 mounted in bearings in the slides 37 which are adapted to be moved endwise of the side rails 12, each slide 37 having a flange 38 at its upper end disposed in a groove in the upper face of a rack 39 secured to the under face of the horizontal flange of the side rail 12 as shown in Fig. 3.

These racks 39 have teeth 40 on their under-faces and spur gears 41 on the shaft 36 mesh with these teeth 40.

The opposite ends of the shaft 36 are provided with squared sockets 42 adapted to receive the squared end of an operating crank whereby the shaft 36 may be rotated thereby causing the slides 37 to be moved along the racks 39 until the required inclination of the bars 29 has been attained or said bars and the foot-rest 30 have been alined with the side bars 14.

To the outer ends of the bent bars 32 are pivoted at 43, struts 44, having in one edge thereof a plurality of notches 45 adapted to engage a cross bar 46 on the foot frame thereby raising the outer end of the U-shaped frame 30 considerably above the pivots 28 thus providing means whereby the feet and legs of the patient may be raised considerably above the body which is often desirable.

A woven spring 47 is attached at its edges to the side bars 14, the U-shaped frame 16, the bars 29 and the U-shaped frame 30 and on this spring 47 may be disposed the usual mattress.

Revolubly mounted in bearings 48 at opposite ends of the side rails 12 is a shaft 49 having at each end a squared socket 50 adapted to receive a square end of an operating crank by which said shaft may be rotated.

On each end of the shaft 49 is a drum 51 and a ratchet wheel 52 with which a pawl 53 coacts to prevent the rotation of said drum 51 in one direction under normal conditions.

Each drum 51 has secured thereto one end of a cord 54, which cord passes over a sheave 55 downwardly around another sheave 56, then over the sheave 55 to a lug 57 to which it is secured.

The lug 57 and the sheave 56 are mounted upon the lower end of a tubular member 58 surrounding the central vertical rod 59 forming a part of the head or foot frames 10, 11.

By means of this system of blocks and tackle the tubular members 58 are raised whenever the drums 51 are rotated about their axes and said members may be lowered again to their normal positions when the pawls 53 are disengaged from the ratchet wheels 52.

At the upper end of each tubular member 58 is a lug 58* to which is secured a chain 60 or similar flexible member the opposite ends of which are secured at 61 to the end rails 62 of the supplemental body-supporting frame which is composed of said end rails 62, a connecting rail 63 at one side and a revoluble connecting member 64 on the other side.

This member 64 is tubular as shown in Fig. 6 and in its opposite ends are positioned hubs 65 of ratchet wheels 66 with which coact pawls 67 pivoted at 68 to the end rails 62.

The pawls 67 permit the members 64 to be rotated freely in the direction of the arrow *b* on Fig. 4 but prevent rotation in the opposite direction as long as said pawls 67 are in engagement with the ratchets 66.

The hubs 65 are revolubly mounted in the bearings 69 secured to the end rails 62 and are provided with squared sockets 70 adapted to receive the squared end of an operating crank by which said revoluble connecting member 64 may be rotated.

Between the side connecting rail 63 and the revoluble connecting member 64 are a plurality of flexible bands 71 extending transversely of the supplemental body-supporting frame.

These bands 71 have at opposite ends Z-shaped hooks 72 adapted to be inserted in holes in the rail 63 and tubular member 64 and when thus inserted they are adapted to be drawn taut by the rotation of the tubular member 64.

When the patient is stretched flat upon the bed the bands 71 will rest flat upon the mattress with the frame 62—63—64 surrounding the edges of said mattress, and when the patient is to be moved into a reclining or sitting position those bands 71 opposite the back-rest, the leg-rest, and the foot-rest are temporarily removed and the frame 62, 63, 64 remains in its lowest position surrounding the mattress.

If it is desired to lift the patient from the mattress for any particular reason the bands 71 are positioned in the members 63—64 for their entire length and then by rotating the drums 51 the entire supplemental frame with the patient thereon may be quickly lifted into the position shown in Fig. 2, and retained in this position as long as desired.

While the body supporting frame is in this raised position, the bed clothes and mattress may be changed, and if it is desired to give the patient some particular attention every part of the body is accessible to the doctor or nurse.

Owing to the frame 62, 63, 64 being hung from the lugs 58ˣ by the flexible chain connections 60 the frame may be tilted into an inclined position thereby making it possible to more conveniently reach certain parts of the body.

It is obvious that by disengaging the pawls 53 the frame 62, 63, 64 may be again lowered, the speed of the lowering being regulated by the operating crank inserted in the socket 50.

All of the sockets 27 42, 50, 70 are of the same size and shape so that a single operating crank may be used in either of them.

The legs of the end frames 10, 11 are provided with a connecting bar 73 between which and the connecting bar 16 is a casing 74 inclosing the lower ends of the tubular members 58 and the sheaves 55 and 56.

This makes a very convenient bedstead for invalids in which the various parts may be readily changed in position to accommodate the various conditions of the patients occupying the same.

It is believed that the operation of the invention and its many advantages will be fully understood without further description.

Having thus described my invention, I claim:

1. In a device of the class described, a main frame; oppositely disposed side bars superimposed on said frame intermediate its ends; a leg-rest pivoted to said side bars; a foot-rest pivoted to said leg-rest; an arm pivoted to each side; and links connecting the outer end of said arm to the foot-rest and leg-rest.

2. In a device of the class described, a main frame; oppositely disposed side bars superimposed on said frame intermediate its ends: a leg-rest pivoted to said side bars; a foot-rest pivoted to said leg-rest; an arm pivoted to each side and having one portion thereof parallel to and separate from said rests when alined; and links connecting the outer end of said arm to the foot-rest and leg-rest.

3. In a device of the class described, a main frame; oppositely disposed side bars superimposed on said frame intermediate its ends; a leg-rest pivoted to said side bars; a foot-rest pivoted to said leg-rest; an arm pivoted to each side; links connecting the outer end of said arm to the foot-rest and leg-rest; and a strut pivoted to the outer end of each arm, and provided with plurality of notches to engage a fixed part of the main frame and thereby regulate the position of said rests.

4. In a device of the class described, a main frame; oppositely disposed side bars superimposed on said frame intermediate its ends; a leg-rest pivoted to said side bars; members movable lengthwise of said main frame; a revoluble shaft in bearings on said movable members; rollers thereon coacting with and supporting said leg-rest: and means for moving said members lengthwise of said main frame.

5. In a device of the class described, a main frame; oppositely disposed side bars superimposed on said frame intermediate its ends; a leg-rest pivoted to said side bars; members movable lengthwise of said main frame; a revoluble shaft in bearings on said movable members; rollers thereon coacting with and supporting said leg-rest; a rack on said movable members; and a gear on said revoluble shaft meshing with said rack.

Signed by me at 4 Post Office Sq., Boston, Mass. this 5th day of June, 1918.

CHARLES H. DANFORTH.

Witnesses:

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NATHAN C. LOMBARD.