

Jan. 4, 1955

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VARIABLE HEIGHT BED

2,698,442

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2 Sheets-Sheet 1

Fig. 1

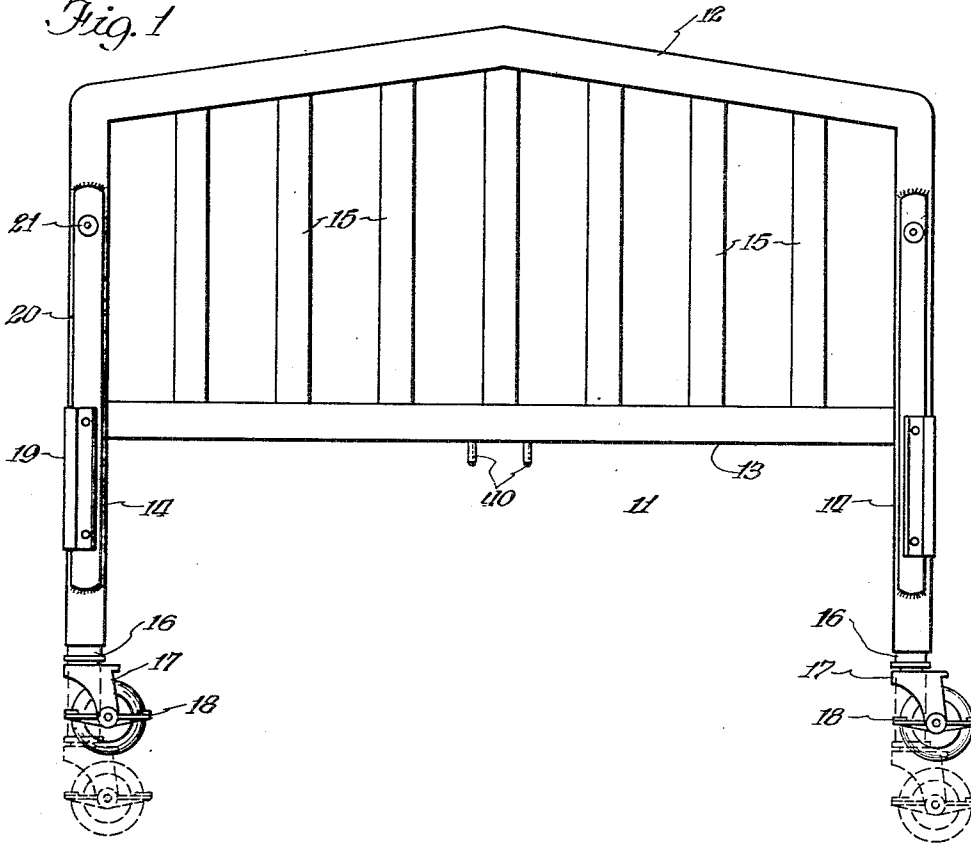


Fig. 3

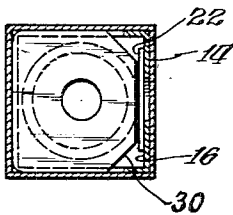


Fig. 4

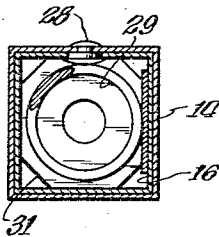
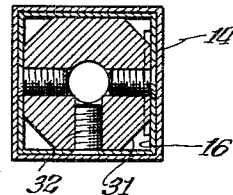


Fig. 5



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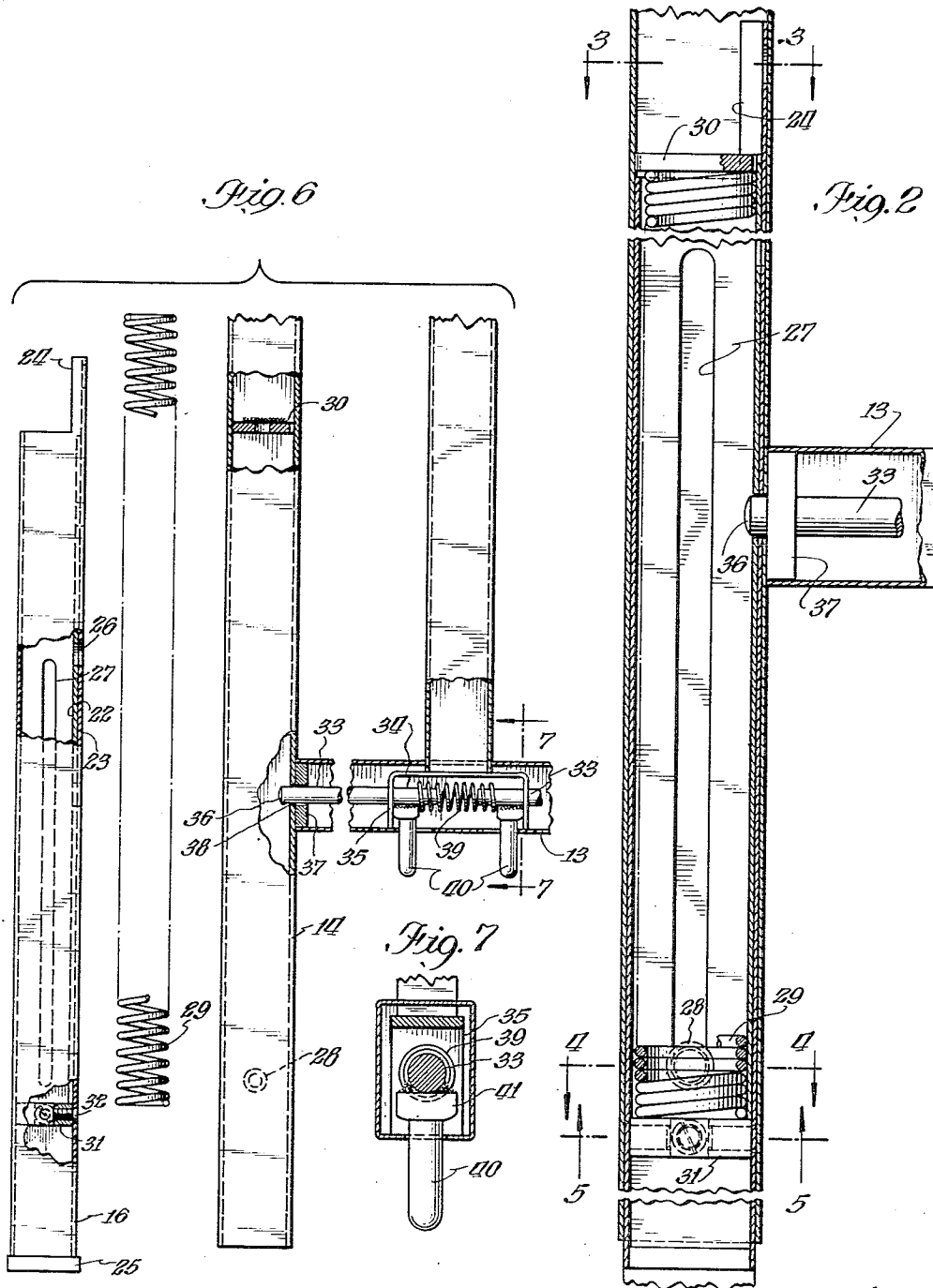
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2 Sheets-Sheet 2



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VARIABLE HEIGHT BED

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1 Claim. (Cl. 5—11)

This invention relates generally to bed structures, and more particularly to adjustable height beds of the type normally used in hospitals.

It is the principal object of my invention to provide an improved adjustable height bed which may be simply and inexpensively produced. Another object of my invention is to provide such a bed, the height of which may be quickly and easily adjusted with the minimum application of force.

To achieve these objects, as will hereinafter appear in detail, the novel bed structure embodying my invention is provided with extensible legs which may be adjusted by simple control means located conveniently at the head and foot of the bed. Specifically, these legs comprise telescoping tubular sections which are slidably extendable to a number of predetermined stations at which the sections may be restrained by a manually operable stop device. A balancing spring enclosed within the sections reduces to a minimum the lifting force required to raise the bed between successive positions, making possible the elimination of expensive force-multiplying apparatus.

Other objects and advantages will appear, and my invention will be better understood by reference to the accompanying drawings, in which:

Figure 1 is an elevational view of a bedstead end-frame provided with extensible legs in accordance with my invention;

Figure 2 is an enlarged elevational view of a portion of the bedstead end-frame illustrated in Figure 1, and which has been cut away and cross-hatched to show the operative relationship of the constituent parts;

Figures 3, 4, and 5 are sectional views taken along the axes 3—3, 4—4 and 5—5 of the extensible leg shown in Figure 2;

Figure 6 is an elevational view of the separated leg members, and the position-selecting detent mechanism, appropriately cut away and cross-hatched to clearly show the inner parts; and

Figure 7 is a sectional view taken along the axis 7—7 of Figure 6 to show the details of the detent operators.

The particular embodiment of the invention illustrated in Figure 1 is a bedstead end-frame 11 comprising an upper horizontal member 12 and a lower horizontal member 13 connected by, and supported upon, vertical members or posts 14. Additional vertical bracing members 15 are provided intermediate the posts 14 to impart rigidity to the end-frame, which is preferably of welded, tubular metal construction. Slidably contained within the posts 14 are extensible legs 16 provided at their lower ends with castors 17, the latter having conventional pedal-operated brakes 18. Side-rail supporting brackets 19 are attached to facing-strips 20, which are in turn welded or otherwise affixed to posts 14. The facing strips 20 desirably extend upwardly for a considerable distance along the post 14 so as to provide convenient mountings 21 for various therapeutic devices. Extending downwardly from the center of the lower horizontal member 13 is a pair of locking-rod operating handles 40 which form part of the detent mechanism, later to be described in detail. While, for the sake of clarity in the drawings, the legs 16 have been represented as downwardly extensible to the dotted-line position shown in Figure 1, it will be understood that, in operation, the bedstead frame is raised or depressed with respect to the legs 16, which remain vertically immobile.

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The details of the extensible post structure are shown in Figures 2, 3, 4, 5, and 6. The inner leg member 16 is preferably formed of a rectangular metal tube 23, and is reinforced by a metal strip 22 welded to the inside of the tube. The tube 23 terminates at its upper end in an extension 24. At the lower end of the leg member is an appropriate fitting 25 to accommodate a castor 17, as indicated in Figure 1. The reinforced tube 23 and the extension 24 are provided with a series of abutments comprising, in the present instance, holes 26, extending through the wall of the tube 23 and its reinforcing strip 22. An elongated slot 27 is provided in one of the adjacent walls to co-act with an inwardly projecting shoulder rivet 28 in the corresponding wall of outer post member 14, so as to limit the travel of inner member 16.

Contained within the assembled tubes is a compression coil spring 29 restrained at its upper end by a retaining block 30 welded within the outer tube, and at its lower end by a similar block 31 secured within the inner tube by screws 32, rather than by welding, in order to facilitate assembly. The spring 29 urges the inner tube toward its fully extended position, which is determined by the engagement of the upper end of slot 27 with rivet 28. The inner tube 16 may be retracted in the reverse direction to compress the spring, its fully retracted position being determined by the engagement of the lower end of slot 27 with shoulder rivet 28, as shown in Figure 2. To accommodate the passage of the extension 24 of the reinforced wall 23 of the inner member 16, the corners of the upper spring-retaining block 30 are generously chamfered and the block itself is spaced from the corresponding wall of the outer post 14, as shown best in Figure 3.

Housed within the lower cross member 13 is a pair of aligned locking rods or detents 33 slidably supported near their inner ends 34 by an inverted, U-shaped bracket 35 and near their outer ends 36 by bearing blocks 37, each of which is aligned with a hole 38 in the wall of the outer tube 14. The outer ends of the locking rods may be slid into the post 14 and into the inner leg member 16 as the holes 26 successively overlie the hole 38, thereby locking the post and inner leg member against relative movement. The strip 22 and the block 37 increase the bearing area at the points of contact between rod and tubes in order to prevent deformation of the relatively thin tube walls.

Urging the rods 33 outwardly and apart is a compressed coil spring 39, the ends of which encompass the opposed inner ends of the rods. Extending downwardly through slots in the wall of cross member 13 is a pair of operating handles 40, which are so spaced as to be conveniently grasped between the thumb and fingers of one hand to simultaneously withdraw the outer ends of the locking rods from the holes in the inner tube 16. These handles are screwed into nuts 41 welded to the rods 33 at points adjacent their inner ends. The nuts 41 prevent spring 39 from slipping on the rod ends 34 and also serve, by their engagement with the U-shaped bracket 35, to limit the travel of outer rod ends 36 into the post 14.

The adjustment of the height of a bedstead incorporating my invention may be simply accomplished in the following manner: Assuming the bed to be at its lowest position, with the extensible leg member 16 fully retracted as shown in Figure 2, the operator grasps the handles 40 in one hand, squeezing them together to withdraw the outer ends 36 of the locking rods out of engagement with the associated holes 26 in leg members 16. The bedstead may then be lifted with the other hand to a new position, determined by the engagement of the locking rod with one of the other holes 26. The bulk of the lifting force is desirably provided by the springs 29, though it will be understood that, limited only by the space within the post 14 and the character of the spring, all or any portion of the lifting force may be provided by the spring.

While I have described my invention by reference to the specific embodiment illustrated, it will be apparent to those skilled in the art that modifications thereof may be made without departing from the spirit of the invention.

I claim:

A bedstead end frame comprising a pair of spaced hollow posts and a cross tube extending between and secured to said posts, an extensible leg member slidably and non-rotatably telescoped within each post, interengaging means on each post and its associated leg member confining the sliding movement of the leg member between a retracted and an extended position relative to the post, a coil spring within each of said posts tending to elevate the post relative to the leg member, said leg member having a series of spaced abutments formed in its inwardly facing side, a pair of axially aligned detent rods each slidably supported within said cross tube and axially movable through a hole in one of said posts to selectively engage said abutments on the associated leg member for preventing relative movement of said post and leg member, spring means interposed between the inner ends of said detent rods and urging said rods outwardly to engage said abutments, the wall of said cross tube having

spaced longitudinal slots formed therein adjacent the midpoint thereof, a handle on each of said rods, each handle extending out of said cross tube through one of said slots, said handles being spaced a convenient distance apart to permit simultaneous disengagement of said rods from said abutments by one hand of an attendant for raising and lowering said end frame.

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