

March 14, 1967

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3,308,485

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FIG. 1

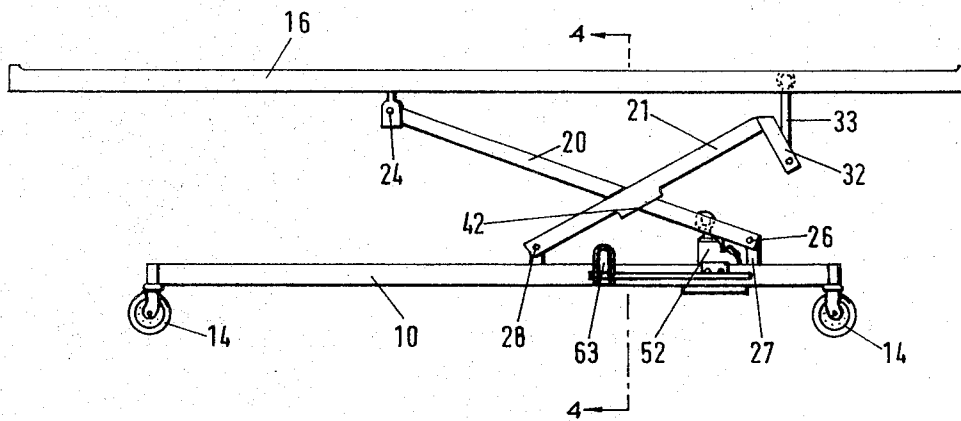
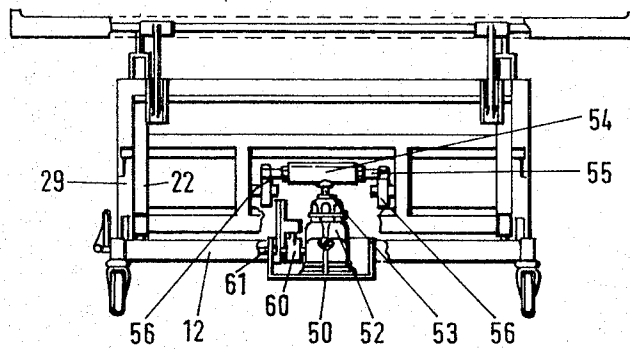


FIG. 2



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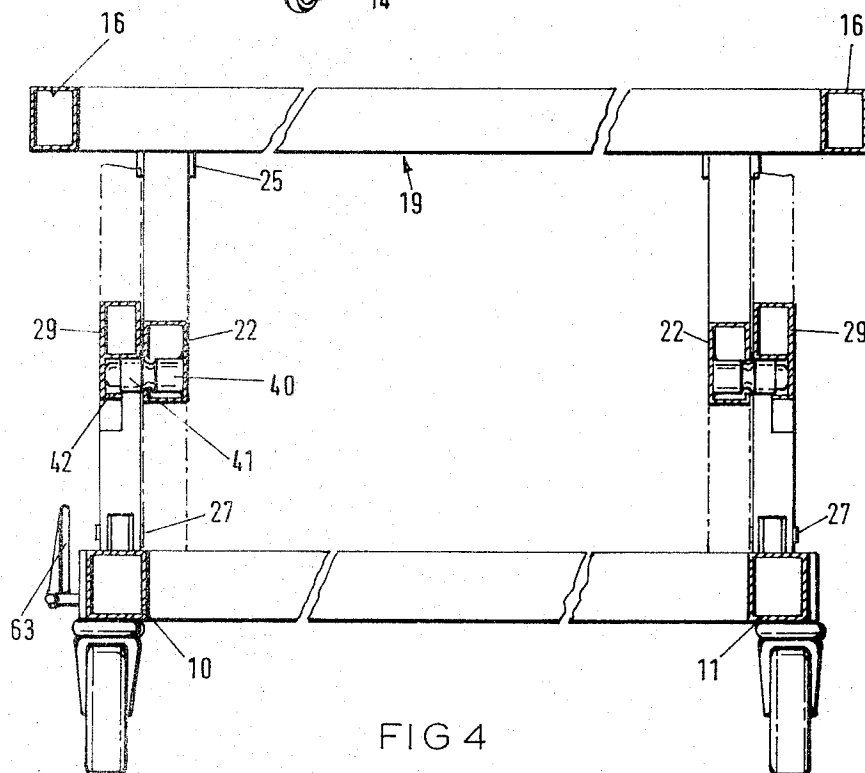
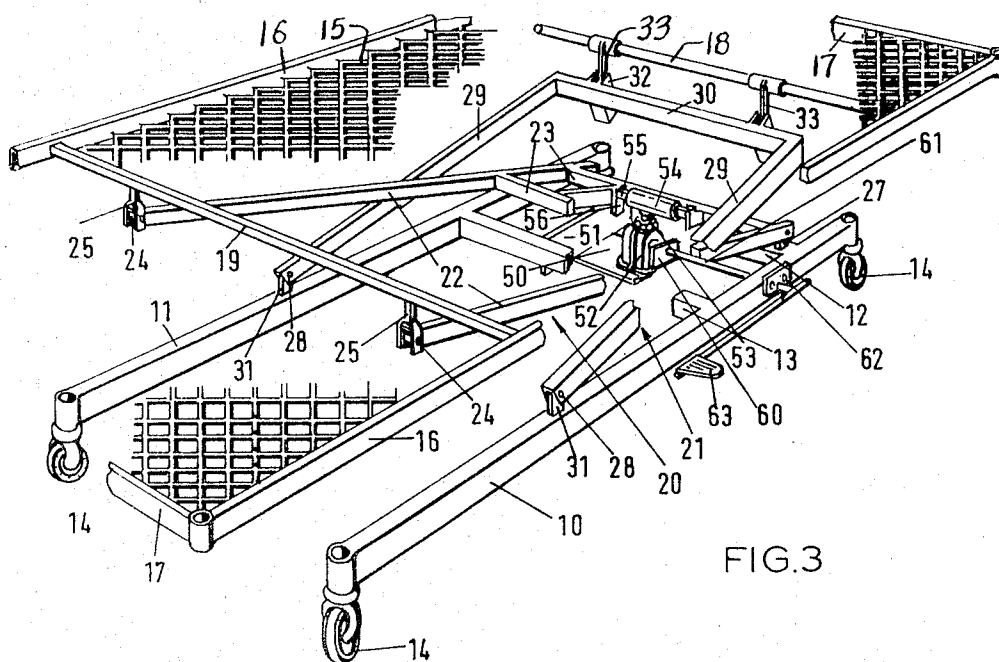
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52,512/64; Sept. 2, 1965, 37,470/65

2 Claims. (Cl. 5-63)

This invention relates to beds and other supports particularly hospital beds and trolleys of the kind having a mattress-frame and a base-frame and a hydraulic or like ram interposed between the two, whereby the height of the mattress-frame may be varied.

Beds of this kind are well-known in theory but have been used to a relatively small extent in practice because of difficulties in maintaining rigidity without complicating the design and rendering the beds unacceptably expensive. The object of the invention is, therefore, to provide an improved bed which has adequate rigidity but which is not unduly expensive.

In accordance with the invention a bed of the kind referred to is characterised by the utilization of a separable pressure fluid ram unit.

Hence the ram may be a hydraulic jack of the kind commonly used in jacking a motor car axle prior to removal of a road wheel, and the advantages of this are that such a jack is compact, efficient, inexpensive and also easily removed for any necessary servicing or replacement.

One preferred embodiment of the invention will now be more particularly described by way of example and with reference to the accompanying drawings wherein:

FIG. 1 is a side elevation of a hospital bed;

FIG. 2 is a front elevation thereof;

FIG. 3 is a perspective view of the complete bed; and

FIG. 4 is taken on the line 4-4 of FIG. 1.

All of the figures are part-broken away for clarity.

Referring now to the drawings and particularly FIG. 3 thereof, the bed shown comprises a base-frame having a pair of parallel members 10, 11 which are spanned by a pair of transverse members 12, 13. The side members carry castors 14 at each end and the castors may be arranged to be braked or rendered immobile by any convenient means (not shown). Thus, the base frame may be wheeled about the hospital ward and locked in any desired position for use.

Generally parallel to the base frame is a mattress-frame comprising a mesh or other mattress supporting element 15 carried between parallel side members 16 and end members 17. The mattress-frame also has a pair of transverse bars or the like 18, 19 the purpose of which will be described more particularly hereinafter.

Interposed between the mattress-frame and the base-frame is an X-linkage consisting of two crossed structures indicated at 20 and 21, see FIG. 1. As better shown in FIG. 3 the structure 20 comprises a pair of side arms 22 spanned by a pair of transverse bars 23 which render the complete structure 20 rigid and unitary. The free ends of the arms 22 are pinned at 24 to stirrups 25 which are integral with the said transverse bars 19. At the opposite ends of the arms 22 they are mounted on coaxial pins 26 carried by lugs 27 on the base frame.

Similarly the structure 21 comprises side arms 29 joined by a unitary bar 30 and the arms are pinned at 28 to lugs 31 also on the base-frame. The bar 30 carries depending lugs 32, see FIG. 1, and the lower end of the lugs are pinned to links 33 which are freely rotatably on the transverse bars 18. Hence it will be clear that upon any movement of the mattress-frame towards or away from the base-frame there will be pivoting of the

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two structures 20 and 21 upon their respective pins 26 and 28 and also at the other ends of the structures via the links 33 and upon pins 24.

The two structures 20 and 21 are connected together at the cross over points, see FIG. 4, by providing each member 22 with a pin 40, the two pins being co-axial, and each pin carrying a roller 41 which engages in a channel section extension 42 secured to the respective member 29. The length of the channel section is such that in the normal range of movement between the mattress-frame being at its lowest and highest positions the rollers traverse the length of the extensions.

The base-frame is provided with a platform 50 located between the members 12 and 13. The platform houses a hydraulic jack 52.

The free end of the ram 53 contacts a roller 54 carried on a spindle 55 and the free ends of the spindle are fast with swinging links 56, FIG. 2 pinned to the structure 20. These links allow the jack body to remain stationary, i.e. not rock, during extension. Hence extension of the jack 52 swings the structure 20 about the pins 26 and the reaction at the cross over point results in elevation of the structure 21.

The jack is provided with conventional operating lever and socket which are engaged by a contact plate 60 and the plate is fast with rod 61 which is journaled in block 62 carried on the side member 10 and integral with pedal and lever 63. The pedal may be adapted to be folded to the position shown in FIG. 1 when not required for use and into the position shown in FIG. 3 when ready for use.

The jack is arranged in a conventional manner so that movement of the pedal between two normally extreme positions displaces fluid to extend the ram and hence elevate the mattress-frame and movement of the pedal beyond one extreme position after overcoming a spring in the jack releases fluid so that the mattress-frame is lowered. The contact plate 60 allows the jack to be disengaged from the pedal and operating rod when desired, and, by holding the mattress-frame elevated and lowering the ram the jack may be lifted bodily out of the well or platform 50.

The links 33 which connect the mattress-frame to the X-linkage may be adjustable in length whereby the angle of inclination of the mattress-frame may be varied.

It will also be appreciated that the invention although described with reference to a bed is equally applicable to a stretcher trolley and other applications where it is desired to provide means for rapidly raising a patient to a convenient "nursing height" and then rapidly or otherwise lowering the patient to a lower level which is better for the patient, e.g. in unassisted exit from the bed.

I claim:

1. A hospital bed or trolley comprising:

a base frame,

a mattress frame located above the base frame,

a linkage connected to the base frame and to the mattress frame,

a hydraulic jack for elevating and lowering the mattress frame relative to the base frame, and

a swinging link;

said linkage comprising a pair of crossed members, the lower ends of both the said pair of members being pivotally connected to the base frame about axes fixed in relation to the base frame,

the upper end of one of said pair of members being likewise pivotally connected to the mattress frame about an axis fixed in relation to the mattress frame,

the upper end of the other of said pair of members being pivotally connected to said swinging link and said swinging link being itself pivoted about an axis fixed in relation to the mattress frame;

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said crossed members, at the point of intersection, being connected together by a roller on one member engaging a track upon the other member; and said hydraulic jack being located with one end abutting said base frame, and the other end abutting said linkage.

2. A bed as claimed in claim 1 wherein said linkage includes two like sets of crossed members, one set at each side of the bed, said two sets being interconnected by transversely extending members, one of said members carrying a pair of pivoted links, said links being spanned by a spindle carrying a roller, and said jack having one end abutting said roller.

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