June 4, 1940. C. O. NICOLAI 2,203,204

INVALID ELEVATOR

Filed Aug. 19, 1939 3 Sheets-Sheet 1

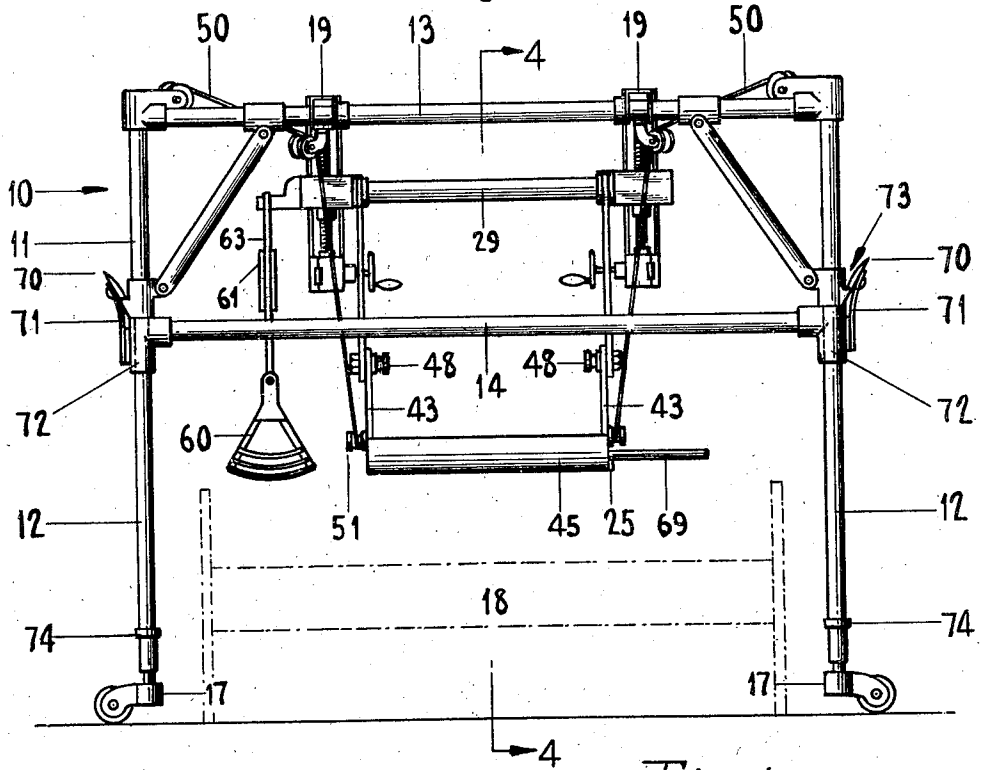


Fig. 1

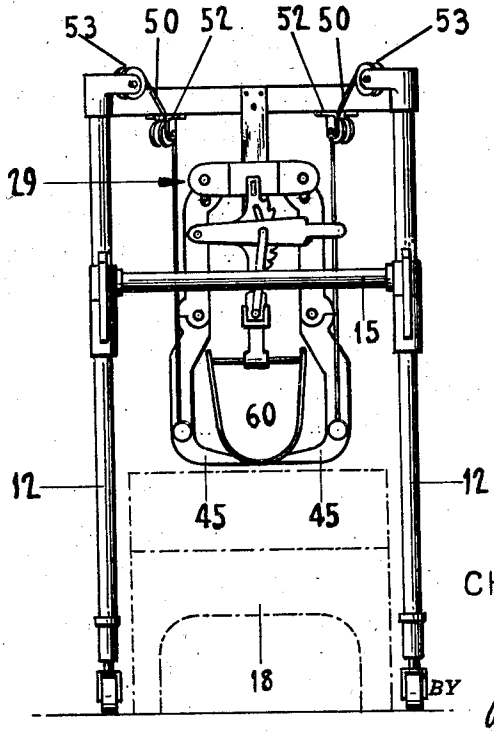


Fig. 2

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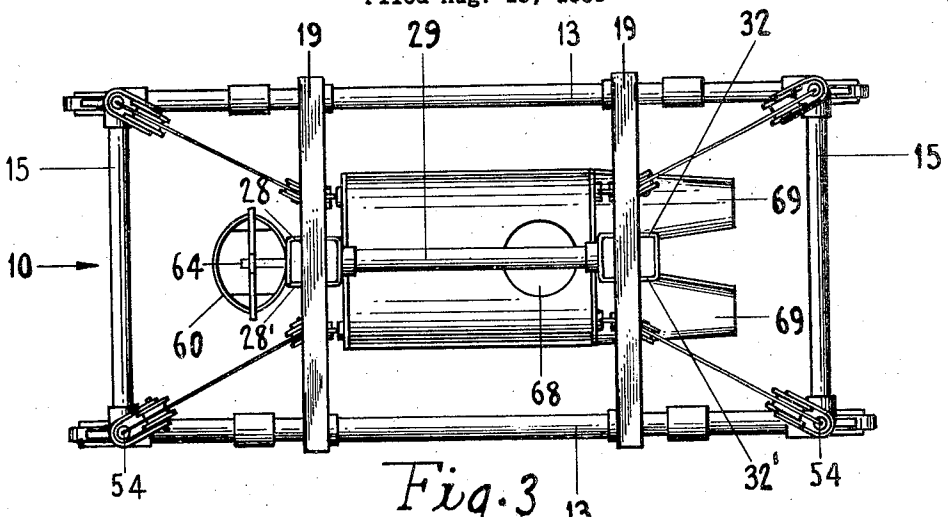


Fig. 3

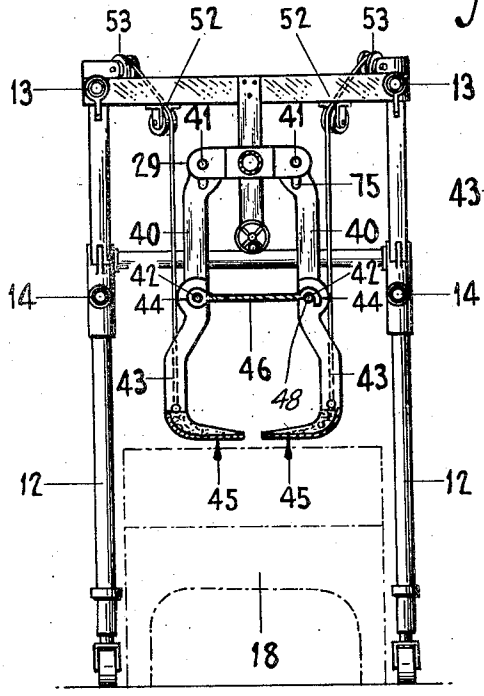


Fig. 4

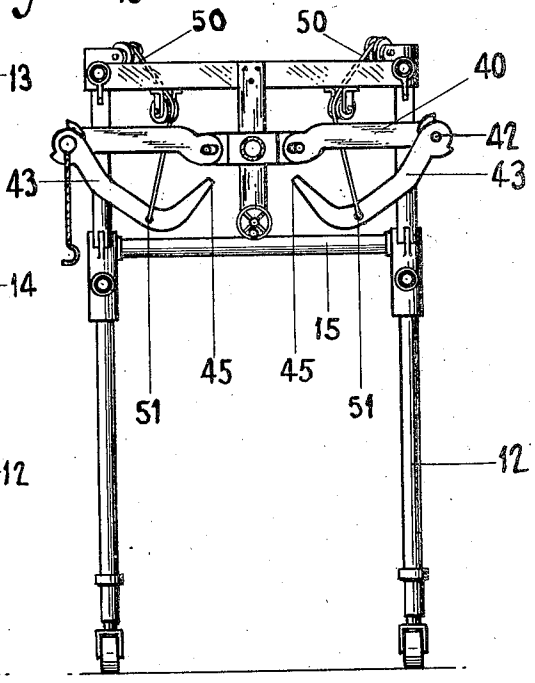


Fig. 5

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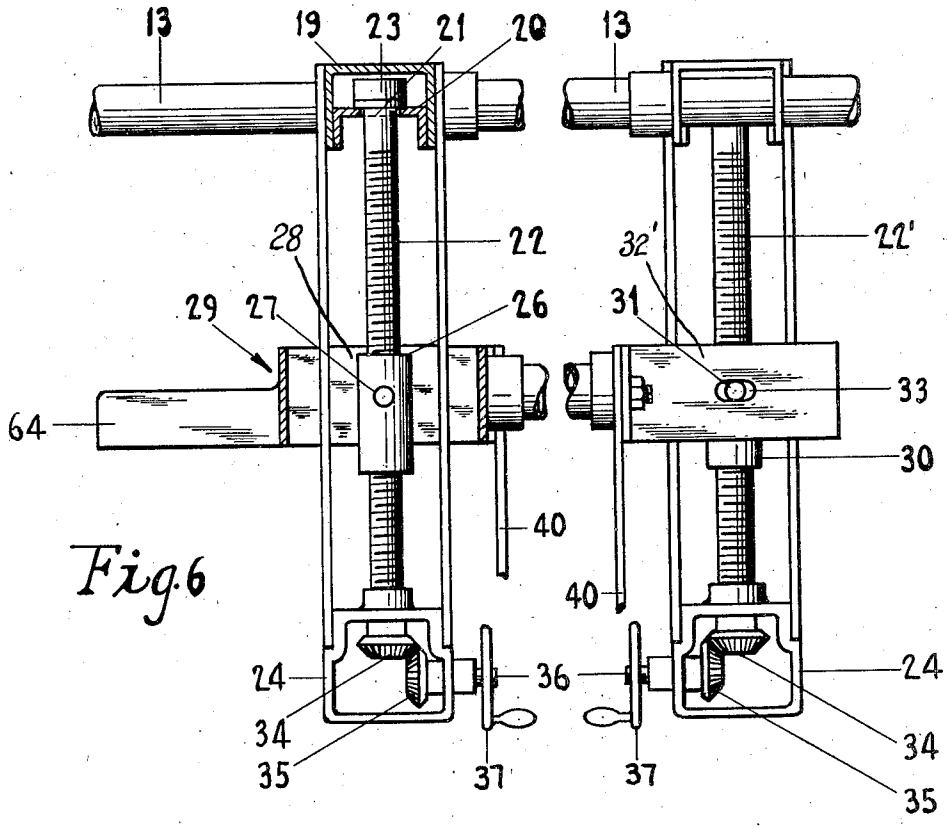


Fig. 6

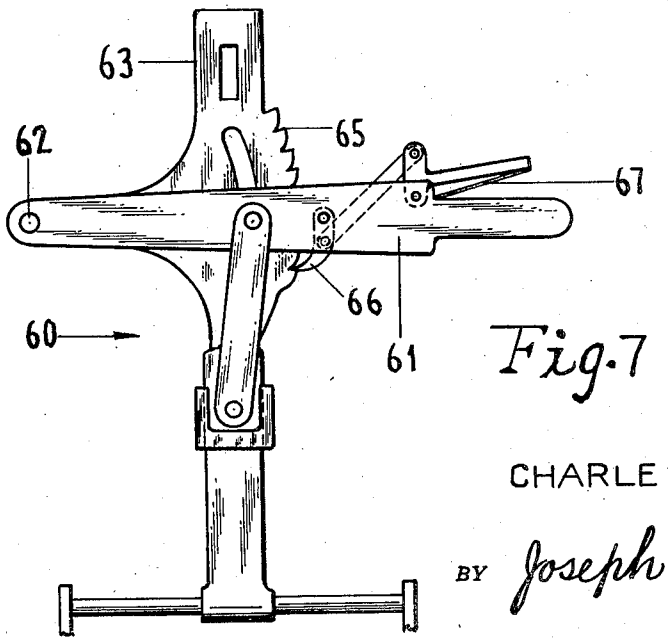


Fig. 7

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Patented June 4, 1940 2,203,204

UNITED STATES PATENT OFFICE

2,203,204

INVALID ELEVATOR

Charles O. Nicolai, New York, N. Y.

Application August 19, 1939, Serial No. 290,965

3 Claims. (Cl. 5—81)

This invention relates to hospital equipment, and it consists of an apparatus adapted to be used in lifting sick persons from their cots or beds, holding them in a comfortable position while their cots or beds are being re-arranged, changed or made up, conveying the patient from one room to another, and to gently replace them upon their cots or beds.

An object of this invention is to provide an invalid elevator comprising an upright mobile frame having cross-bars fixed thereto at its upper end, and having a longitudinally divided platform and means for raising or lowering the platform by mechanism supported by said cross-bars.

Another object of this invention is to provide a body-lifting-frame for supporting the platform members, the said frame being designed to be raised or lowered at either end so as to adjust the platform in any desired angular position, especially when the patient, while on the platform, is to be placed over a bedpan.

Another object of this invention is to provide a longitudinally divided platform supported by jointed members including an elbow joint which can be broken only in an upward direction, so as to permit the folding of said jointed members for moving said platform members into an inoperative upper position.

This application is a continuation in part of my application Serial No. 162,387, filed September 3, 1937.

With the above and other objects in view, the invention will be hereinafter more particularly described, and the combination and arrangement of parts will be shown in the accompanying drawings and pointed out in the claims which form part of this specification.

Reference will now be had to the drawings, wherein like numerals of reference designate corresponding parts throughout the several views, in which:

Figure 1 is a side elevation of my invalid elevator, illustrating the apparatus in conjunction with a bed.

Figure 2 is an end elevation of the invalid elevator.

Figure 3 is a top plan view.

Figure 4 is a cross-sectional view, the section being taken as on line 4—4 in Figure 1 and showing the platform members in operative position.

Figure 5 is a cross-sectional view, similar to Figure 4, and showing the platform members in an inoperative position.

Figure 6 is an enlarged fragmentary view of the body-lifting-frame, and showing an elongated aperture in said frame which permits the said frame to assume angular positions in relation to the bed.

Figure 7 is a fragmentary front view of the head rest.

In the illustrated embodiment of the invention, the numeral 10 indicates my invalid elevator, comprising an upright mobile frame 11 of rectangular cross-section and mounted on four upright tubular posts 12. The posts 12 are secured on two sides by two elongated rails 13 positioned at the upper portion of the posts, and by two elongated rails 14, slidably mounted on the posts.

Fixed to the posts 12 are rails 15 which are shorter than the rails 13 and 14, the rails 15 being positioned in right-angular relation with the rails 13 and 14 and define the ends of the frame 11. The posts 12 have swivel casters 17 at their lower ends to enable the invalid elevator to be readily steered into position around a bed. Figures 1, 2, and 4 show a conventional bed 18 drawn in dot-and-dash lines, the posts 12 being suitably spaced apart to provide large clearances between the bed 18 and the frame 11.

Secured to the upper rails 13, 13, are cross-bars 19, 19, having secured at their midportions brackets 20. The brackets have apertures 21 to receive elevating screws 22, 22'. The heads 23 of the screws 22 rest on the brackets 20, with the body of the screws in an upright position. The lower ends of the screws are journaled in gear housings 24, which are open at two side walls at their lower ends.

Mounted on the screw 22 is a threaded member 26 having pivots 27 passing slightly into the member 26, up to the screw 22, and which pass through arms 28, 28' at one end of a body-lifting-frame 29 and provide a pivotal mounting for said frame.

Mounted on the screw 22' is a threaded member 30 having pivots 31 passing slightly into the member 30, up to the screw 22' and which pass through arms 32, 32' at the opposite end of the body-lifting-frame 29 and provide another pivotal mounting for said frame. Elongated apertures 33 have been provided in the arms 32, 32' for sliding engagement with the pivots 31.

Bevel gears 34 have been mounted on the lower ends of the elevating screws 22 and 22'. The bevel gears 34 are in meshed engagement with bevel gears 35 secured to shafts 36 which are mounted transversely of the gear housings 24. The shafts 36 have handwheels 37 for manual operation of the elevating screws. The hand-

wheels provide means whereby each end of the body-lifting-frame 29 may be separately raised or lowered.

As best shown in Figure 4, links 40 have been mounted on pivots 41 at opposite sides of the body-lifting-frame 29. Pivotally mounted on pivots 42, at the lower ends of the links 40, are arms 43 which form elbow joints 44 with said links. Each pair of arms 43, lengthwise of the invalid elevator, are integrally secured to a platform member 45, the said platform member being in right-angular relation with the said arms.

On rotation of one of the screws 22 or 22', the frame 29 assumes an angular position and causes the platform members 45 to assume an angular position and to be raised or lowered. It is to be noted that the screw 22 has a right-hand thread and the screw 22' has a left-hand thread so as to permit rotation of both screws simultaneously and to raise both ends of the platform when turning both handwheels 37 in one direction.

As shown in Figure 4, the two platform members 45, 45, jointly provide a longitudinally divided platform. The members 45, 45, may be separately and successively swung under a patient. Latch means 46 pivotally mounted at 42 and adapted for attaching to a pin 48 serve for locking the platform members 45, 45, for maintaining the said members in aligned horizontal relation adapted for supporting an invalid thereon and preventing the platform members from spreading apart.

The inoperative position of the platform members 45, 45, and the links 40, is shown in Figure 5, into which position they are moved by flexible cables 50, attached to the arms 43, as at 51, Figure 1. The cables 50 pass over pulleys 52, carried by the cross-bars 19, then over pulleys 53 at the upper ends of the posts 12, and have their ends attached to counterweights 54 freely movable inside the posts 12. When in raised position, the platform members 45, 45, are pivoted on the pins 42 connecting the links 40 and arms 43.

A head rest 60 (Figure 7) is suspended from a hand lever 61, pivoted at 62 on a bar 63. The bar 63 is carried by an extension 64 of the frame 29. The bar 63 has an arcuate rack 65 at one side. The lever 61 carries a pawl 66 actuable by a spring 67. The head of a person may be raised by the head-rest relative to his body on the platform. The body may be raised and lowered by operation of the hand wheels 37. It will be apparent that the invalid elevator may be moved on its swiveling casters to straddle a narrow bed or cot such as are used in hospitals. It is also apparent that by raising the platform members, one end more than the other, that the body of the patient will be positioned angularly with respect to the bed.

The inoperative or folded position of the pivoted links and platform members, as shown in Figure 5, is attained by manually raising the platform members, this upward movement being automatically facilitated by the counterbalancing effect of the counterweights 54, which hold the platform members in the out of the way position above the bed.

The platform members are provided with a commode-opening 68. The platform has a pair of leg-supporting sections 69, 69 extending outwardly from one end of the platform members. The leg-sections are positioned above the bottom surface of the platform members so as to conform to the shape of the body of the person resting on said platform.

While I have shown the leg-supporting sections as a unit with the platform members 45, its is to be understood that the members 69 are detachable from the platform members 45. The members 69 have flanges 25 having bayonet joints (not shown) cooperating with bolts in the ends of the members 45 for suitably connecting these members.

It is to be noted that the rails 14 have upwardly extending arms 70 carried by flat leaf springs 71, the springs being fixed at their lower ends to elbow fittings 72 at the ends of each railing. It is also to be noted that bevelled extensions 73 have been formed on the posts 12 in alignment with the spring arms 70 in their topmost positions. It is thus possible to slide the rails 14 upwardly into interlocking engagement with the extensions 73 to be supported in said upper position. On releasing the spring arms 70, the rails 14 slide down the posts 12 and come to rest on collars 74.

As shown in Figure 4, the links 40 have elongated slots 75 in alignment with the pivots 41 and positioned below the pivots. The slots 75 allow a vertical clearance for a slight raising of the platform members so that the said members will be adapted for sinking into the soft bedding material. It will be seen that the platform members 45 are spaced apart throughout their entire length so that the soft bedding material may rise up to contact the body of the patient.

It is to be noted that the elbow joints 44 can be broken only outwardly and upwardly so as to permit the folding of the jointed members 40 and 43 for moving the platform members 45, 45, into an inoperative upper position. The elbow joints 44 prevent the members 45 from opening up while in latched position.

It is also to be noted that by raising the rails 14 to the position shown in Figure 1, it is possible to move the invalid elevator clear of the bed to another bed or to raise the patient above his own bed and transfer him to a wheel table, such as is used in hospitals.

It will thus be seen that there has been provided a body lifting platform made of two independently supported members which make it possible to first push one platform member with ease under the patient and then to push the other platform member with ease under the patient and then latch the two platform members together. This operation can be done without the necessity of raising the entire body of the patient off the bed at one time, which would require the raising of a considerable weight and causing discomfort to the patient. My invention provides a longitudinally divided platform extending integrally from end to end so as to provide support all along the entire extent of the patient. The patient is comfortably supported while being entirely free for movement in an upward direction, as there is no restraining mechanism above the body of the patient.

I claim:

1. An elevator for invalids comprising an upright mobile frame having cross-bars fixed thereto at its upper end, elevating screws rotatably supported by said cross-bars, each of said screws having one end of an adjustable body-lifting frame supported thereby for vertical movement, the upper end of said body-lifting-frame comprising horizontally positioned members having links pivotally mounted thereon and extending

downwardly, a longitudinally divided platform consisting of two members each extending integrally from end to end thereof, said platform members having arms pivotally supported by said links, each of said links carrying one end of one of said platform members, each of said platform members being in right-angular relation to two of said links when the platform is in body supporting position, each arm forming an elbow joint with one of said links, said elbow joints being designed to be broken outwardly and upwardly to permit upward folding of said arms and links, latches for locking said platform members for maintaining said platform members in aligned horizontal relation adapted for supporting an invalid thereon and preventing said platform members from spreading apart, means for raising or lowering said platform at one end independently of the opposite end, means for counterbalancing said platform members for independently supporting said members in an inoperative upper position and in adjoining relation with said cross-bars, and handwheels for actuating said threaded screws.

2. An elevator for invalids comprising an upright mobile frame having cross-bars fixed thereto at its upper end, elevating screws rotatably mounted in said cross-bars, each of said screws being adapted to support one end of a vertically adjustable body-lifting-frame, said body-lifting-frame comprising horizontally positioned members having links pivotally mounted thereon and extending downwardly, a longitudinally divided platform consisting of two members each extending from end to end thereof, said platform members having arms pivotally supported by said links, each of said links carrying one end of one of said platform members, each of said platform members being in right-angular relation to two of said links, each arm forming an elbow joint with one of said links, said elbow joints being designed to be broken outwardly and upwardly to permit upward folding of said arms and links, latches for locking said platform members for maintaining said platform members in aligned relation adapted for supporting an invalid thereon and preventing said platform members from spreading apart, means for raising or lowering said platform at one end independently of the opposite end, means for counterbalancing said platform members for independently supporting said members in an inoperative upper position, and means for actuating said screws.

3. An elevator for invalids comprising an upright mobile frame having cross-bars fixed thereto at its upper end, elevating screws rotatably mounted in said cross-bars, each of said screws being adapted to support one end of a vertically adjustable body-lifting-frame, said body-lifting-frame comprising horizontally positioned members having links pivotally mounted thereon and extending downwardly, a longitudinally divided platform consisting of two members each extending from end to end thereof, said platform members having arms pivotally supported from said links, each of said links supporting one end of one of said platform members, each arm forming an elbow joint with one of said links, said elbow joints being designed to be broken outwardly and upwardly to permit upward folding of said arms and links, latches for locking said platform members for maintaining said platform members in aligned relation adapted for supporting an invalid thereon, means for raising or lowering said platform at one end independently of the opposite end, means for counterbalancing said platform members for independently supporting said members in an inoperative upper position, and means for actuating said screws.

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