April 14, 1953 M. I. BICKFORD 2,634,431

INVALID LIFT AND CARRIER WITH STRETCHER CLAMP

Filed Jan. 23, 1951 2 SHEETS—SHEET 1

FIG. 1.

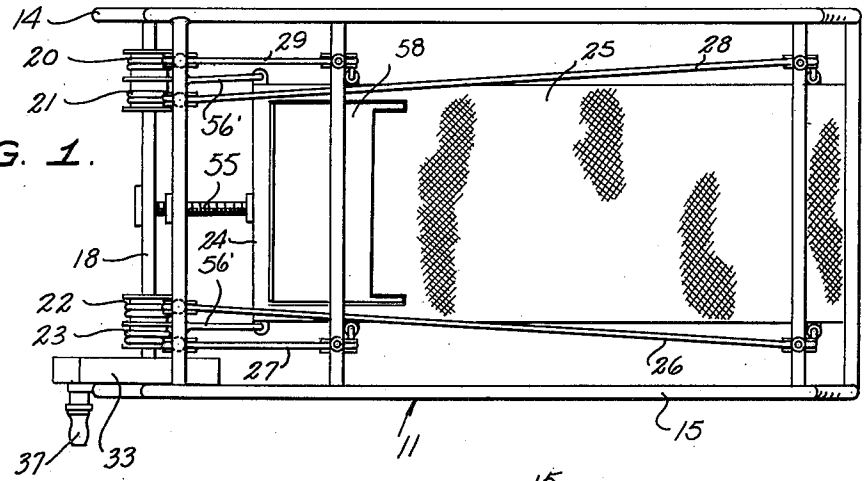
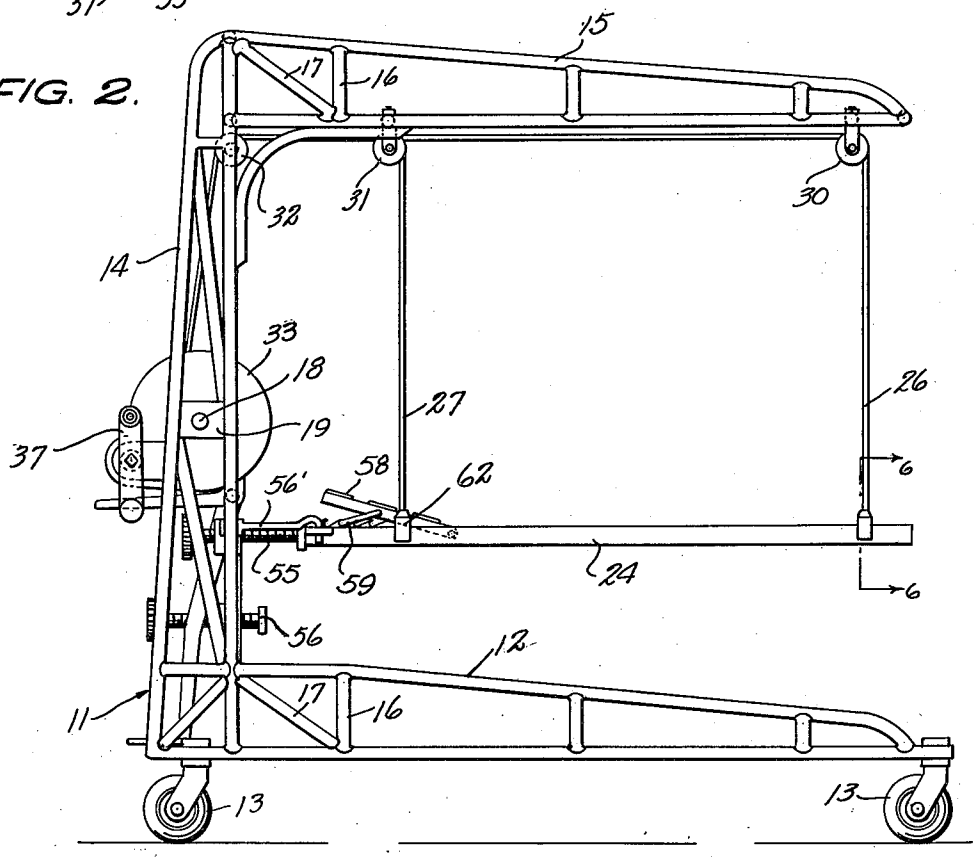


FIG. 2.



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FIG. 3.

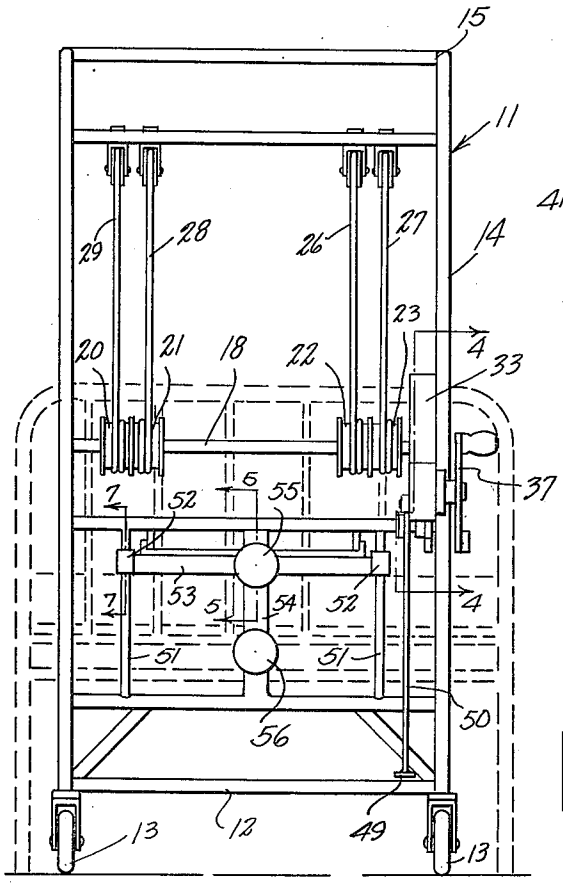


FIG. 4.

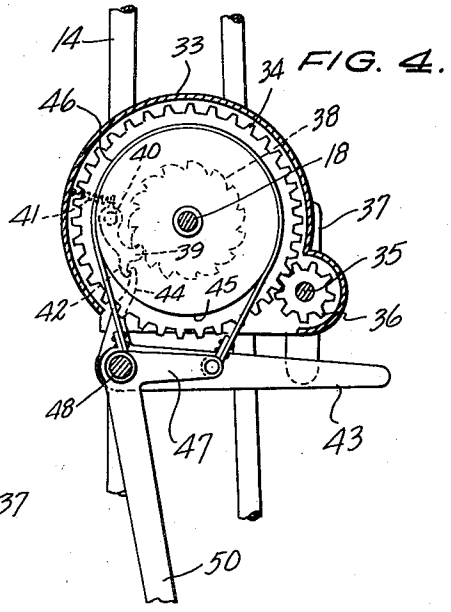


FIG. 5.

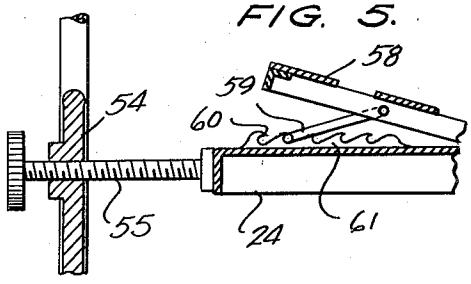


FIG. 6.

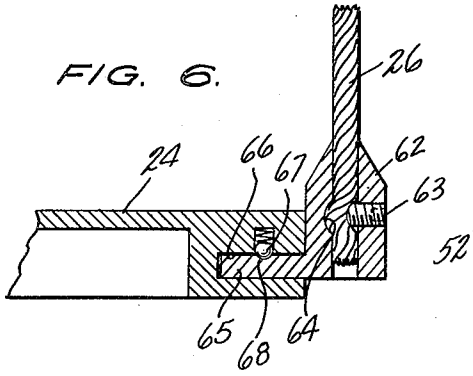
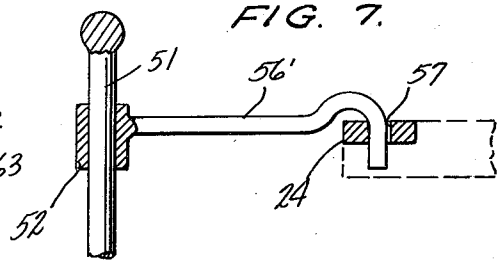


FIG. 7.



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INVALID LIFT AND CARRIER WITH STRETCHER CLAMP

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Application January 23, 1951, Serial No. 207,381

2 Claims. (Cl. 5—86)

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This invention relates to devices for lifting and moving sick persons, and more particularly to an improved carrier arranged to lift an invalid from a bed and to transport the invalid to a different location, or for raising the invalid out of the bed while the bed is being rearranged.

A main object of the invention is to provide a novel and improved lift and carrier device for invalids which is simple in construction, which is easy to operate, and which can be handled by a single nurse or other attendant.

A further object of the invention is to provide an improved apparatus for lifting and carrying invalids, and which may be employed for transporting invalids from their beds to other locations, such as for bathing and similar purposes, and for raising invalids out of bed while rearranging the bed or changing the mattresses thereof, the apparatus involving inexpensive components, being sturdy in construction, and being readily manipulated by a single attendant or nurse.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a top plan view of an improved lifting and carrying apparatus constructed in accordance with the present invention;

Figure 2 is a side elevational view of the apparatus of Figure 1;

Figure 3 is an end elevational view of the apparatus of Figures 1 and 2;

Figure 4 is an enlarged, cross-sectional, detail view taken on line 4—4 of Figure 3;

Figure 5 is an enlarged, cross-sectional, detail view taken on the line 5—5 of Figure 3;

Figure 6 is an enlarged, cross-sectional, detail view taken on line 6—6 of Figure 2;

Figure 7 is an enlarged, cross-sectional, detail view taken on the line 7—7 of Figure 3.

Referring to the drawings, the apparatus is designated generally at 11 and comprises a base portion 12 which is generally rectangular in shape and which is provided at its corner portions with the casters 13. Rigidly secured to one end portion of the base 12 is an upstanding frame portion 14 which is provided with a top portion 15 which extends over and which is substantially coextensive in length with the base portion 12. The portions 12, 14 and 15 may be constructed of any suitable material, and, as shown in the drawings, are preferably formed of hollow tubing arranged to define rigid frameworks which are suitably braced by the provision of internal brace elements, such as shown at 16 and 17.

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Designated at 18 is a transverse shaft which is journaled in plate elements 19 rigidly secured to the upstanding framework 14 on opposite sides thereof. Secured on the shaft 18 are the respective pairs of reels 20, 21 and 22, 23. Designated at 24 is a rectangular frame which is provided with a suitable supporting surface 25 of flexible material on which a patient may be comfortably supported. Connected to one side of the frame 24 are the respective cables 26 and 27, and connected to the other side of the frame 24 are the respective cables 28 and 29. Said cables 26, 27, 28 and 29 extend over pulleys suspended from the top frame portion 15, as shown at 30, 31 and 32, in Figure 2, and are secured to the respective reels 22, 23, 21 and 20, as shown in Figure 1.

Secured to one side of the upstanding frame portion 14 is a housing 33. The shaft 18 extends rotatably through said housing, and secured on said shaft in said housing is a large gear 34. Journaled in the housing is a shaft 35 on which is secured a small gear 36 which meshes with large gear 34. Secured to the end of shaft 35 is a hand crank 37. Rotation of hand crank 37 causes shaft 18 to be rotated due to the meshing engagement of gears 36 and 34, whereby the cables 26, 27, 28 and 29 may be wound up on the reels 22, 23, 21 and 20, thereby elevating the frame 24. Secured on shaft 18 is a ratchet wheel 38 whose toothed periphery is lockingly engaged by a dog 39 which is pivotally connected at 40 to the housing 33 and which is biased into locking engagement with the ratchet wheel 38 by a spring 41. It will be apparent from Figure 4 that the ratchet wheel 34 is free to rotate in a clockwise direction, but is held against free rotation counterclockwise by the dog 39. Frame 24 is elevated by clockwise rotation of shaft 18. Therefore, the dog 39 supports the frame in elevated position by preventing free counterclockwise rotation of the ratchet wheel 38 after the frame has been elevated. The dog 39 is provided with a depending lug element 42. Designated at 43 is a lever pivoted to the side of upstanding frame portion 14 and provided with an upwardly extending arm 44 which is engageable with the lug 42 responsive to counterclockwise rotation of lever 43, as viewed in Figure 4. When lever 43 is rotated upwardly, or counterclockwise, as viewed in Figure 4, the arm 44 engages the lug 42 and moves the dog 39 out of locking position relative to the ratchet wheel 38, allowing the shaft 18 to rotate counterclockwise, and consequently allowing frame 24 to descend. The gear 34 is integrally formed with a brake drum 45, and engaged on said brake drum is a brake band 46. Designated at 47 is a lever

secured to a transverse shaft element 48 journaled in the side portion of frame 14. One end of brake band 46 is secured to the shaft 48, and the other end of the brake band is secured to the end of the arm 47. It will be noted that in effect the brake band 46 is secured to spaced points on the arm 47. Rotation of the arm 47 clockwise, as viewed in Figure 4, will cause the brake band 46 to exert frictional braking force on the drum 45, retarding the rotation of the shaft 18. Braking force is applied to the lever 47 by a foot pedal 49 at the lower end of a depending lever 50 secured to shaft 48. It will be apparent that by depressing the pedal 49, the arm 50 will be rotated clockwise, as viewed in Figure 4, causing the band 46 to exert braking force on the drum 45. Therefore, the rate of descent of the frame 24 may be retarded when the dog 39 has been disengaged from ratchet wheel 38 by stepping on the foot pedal 49.

The upstanding frame portion 14 includes a pair of vertical bar members 51, 51 spaced symmetrically adjacent the opposite sides of the frame portion 14, and slidably engaged on the bar members 51, 51 are the respective sleeves 52, 52. Designated at 54 is a vertically extending bar element located at the mid-portion of and rigidly secured to the upstanding frame portion 14. Threaded through the vertical bar member 54 are the respective, vertically spaced, clamping screws 55 and 56. Rigidly secured to the sleeves 52, 52 are the respective longitudinally extending hook members 56', as shown in Figure 7, the ends of the hook members being engageable in apertures 57 formed in the corner portions of the frame 24. The ends of the clamping screws 55 and 56 are arranged to engage the intermediate portion of the end of frame 24 when said frame is horizontally aligned with one or the other of said clamping screws. It will be apparent that with the hook members 56' engaging in the apertures 57 of the frame 24 and with one or the other of the clamping screws 55 or 56 tightly engaged against the end of the frame, the frame will be rigidly secured in a fixed position and will be held against swinging from side to side. It will thus be apparent that the frame 24 may be locked in either one of two positions by means of the clamping screws 55 and 56 during the transportation of a patient on the apparatus. Since the sleeve members 52, 52 are slidable vertically on the bar members 51, 51, the hooks 56' may be readily moved into engaging positions relative to the frame 24 regardless of which of the clamping screws 55 or 56 is to be employed, thereby providing means of locking the frame 24 in either one of two positions on the apparatus.

The frame 24 is provided adjacent one end thereof with a pivoted head rest 58 which is adjustable to various positions of inclination with respect to the plane of frame 24 and which may be supported in adjusted position by the provision of a pivoted supporting bail 59 connected to the head rest 58 and engageable with spaced anchoring notches 60 of an upstanding, longitudinally extending locking bracket 61 secured on the frame 24 beneath the head rest 58.

The cables 26, 27, 28 and 29 are arranged to be readily disconnected from the frame 24 so that the frame may be detached from the remainder of the apparatus whenever desired. As shown in Figure 6, each cable may be clamped to a sleeve member 62 by a set screw, designated at 63, the cable extending through the sleeve member and being forced into a recess 64 in bore of the sleeve member by the tightening of the set screw 63. This firmly secures the end of the cable to the sleeve member 62. Each sleeve member 62 is formed at its end with a lug 65 extending at right angles thereto, said lug being received in a recess 66 formed in the edge of the frame 24. The lug 65 is yieldably secured in the recess 66 by a spring-pressed ball detent 67 provided in the edge of the frame and projecting into the recess 66, said ball detent being engageable with a depression 68 formed in the lug 65, whereby the lug is yieldably locked in the recess 66 when the ball detent 67 enters the depression 68. It will be apparent that the lug 65 may be withdrawn from the recess 66 by exerting sufficient outward force on the sleeve member 62 to overcome the holding force of the ball detent 67.

In using the device, the apparatus is moved so that the base portion 12 thereof is positioned beneath the bed and extends longitudinally thereof, as shown in Figure 3, the top frame portion 15 overlying the bed. The patient-supporting frame 24 is then lowered onto the bed and the patient is lifted onto said frame 24. The frame 24 is then elevated by rotating the crank handle 37, the elevation of the frame 24 being made sufficient to clear the footboard of the bed when the apparatus is moved rearwardly therefrom. In transporting the patient, the frame 24 may be steadied by engaging the end of the frame 24 with the hooks 56', 56', as above described, either of the clamping screws 55 or 56 being employed to securely lock the frame. As above explained, the patient may be transported to any desired location and lowered onto a table, such as an operating table or other desired location, and the cables 26, 27, 28 and 29 may be detached from the frame 24, whereby the apparatus may be removed without further disturbing the patient. In order to transport a patient back to his bed or to any other location, it is merely necessary to re-engage the lugs 65 of the cable-attaching sleeves 62 with the frame 24, whereby the frame 24 may be again secured to the remainder of the apparatus.

While a specific embodiment of an improved apparatus for lifting and carrying invalids has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. In an apparatus for lifting and carrying invalids, a wheeled base of substantial length, an upstanding frame rigidly secured to one end of said base and provided with a top portion extending over and being substantially coextensive with said base, whereby the top portion extends over an invalid's bed when the base is disposed beneath said bed, winch means carried by said upstanding frame, a horizontal patient-supporting frame, cable means connecting said patient-supporting frame to said winch means and arranged to raise and lower said patient-supporting frame responsive to operation of the winch means, a horizontal, longitudinally extending clamping means engaged with said upstanding frame and being movable into abutment with said patient-supporting frame to move same away from said upstanding frame, and a plurality of hooks connected to said upstanding frame and being lockingly engageable with the patient-supporting frame, said hooks and said clamping means being adapted to secure

the patient-supporting frame when the clamping means is moved into abutment therewith.

2. In an apparatus for lifting and carrying invalids, a wheeled base of substantial length, an upstanding frame rigidly secured to one end of said base and provided with a top portion extending over and being substantially coextensive with said base, whereby the top portion extends over an invalid's bed when the base is disposed beneath said bed, winch means carried by said upstanding frame, a horizontal, patient-supporting frame, cable means connecting said patient-supporting frame to said winch means and arranged to raise and lower said patient-supporting frame responsive to operation of the winch means, a plurality of vertically spaced, horizontally extending, longitudinally movable clamping screws threadedly engaged with said upstanding frame and being movable into abutment with said patient-supporting frame, and a plurality of hooks movably connected to said upstanding frame and being lockingly engageable with the

patient-supporting frame, said hooks and said clamping screws being adapted to secure the patient-supporting frame when one of the clamping screws is moved into abutment therewith.

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