Sept. 8, 1959 C. R. FLANDRICK 2,903,238

INVALID LIFTING AND TRANSPORTING APPARATUS

Filed Jan. 21, 1954 4 Sheets-Sheet 1

Fig. 4.

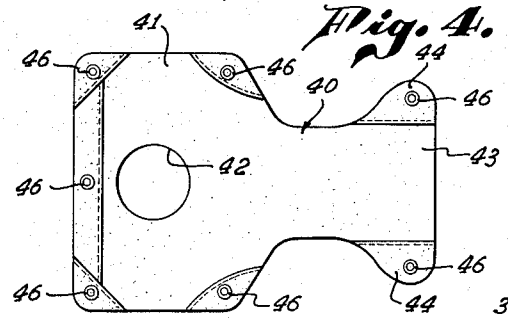


Fig. 1.

Fig. 6.

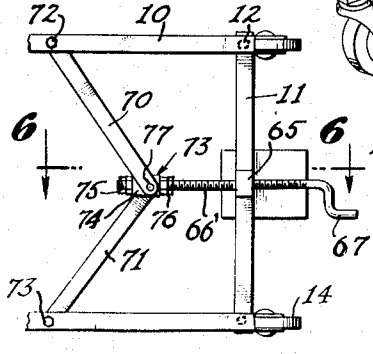


Fig. 5.

CARL R. FLANDRICK,
INVENTOR.

Huebner, Beehler, Worrel & Herzig,
BY

Herbert A. Huebner
ATTORNEYS.

Sept. 8, 1959 C. R. FLANDRICK 2,903,238

INVALID LIFTING AND TRANSPORTING APPARATUS

Filed Jan. 21, 1954 4 Sheets-Sheet 2

Fig. 2.

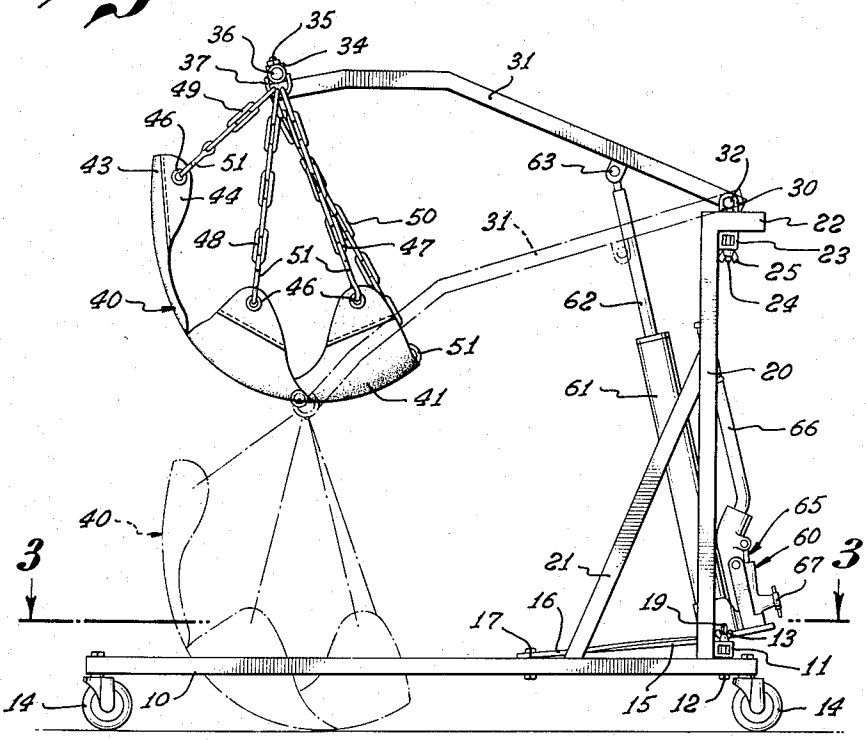
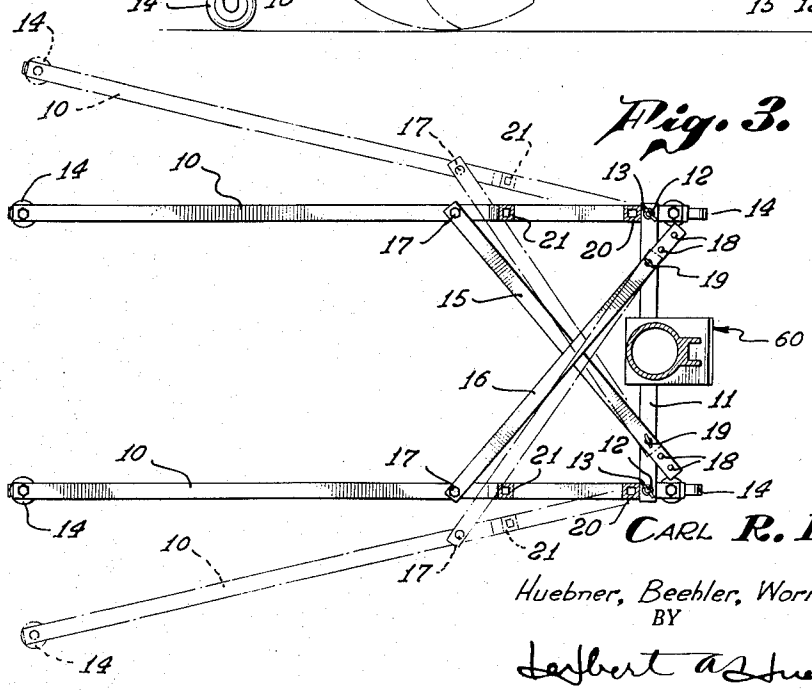


Fig. 3.



CARL R. FLANDRICK,
INVENTOR.

Huebner, Beehler, Worrel & Herzig,
BY

Herbert A. Huebner

ATTORNEYS.

Sept. 8, 1959 C. R. FLANDRICK 2,903,238

INVALID LIFTING AND TRANSPORTING APPARATUS

Filed Jan. 21, 1954 4 Sheets-Sheet 3

Fig. 7.

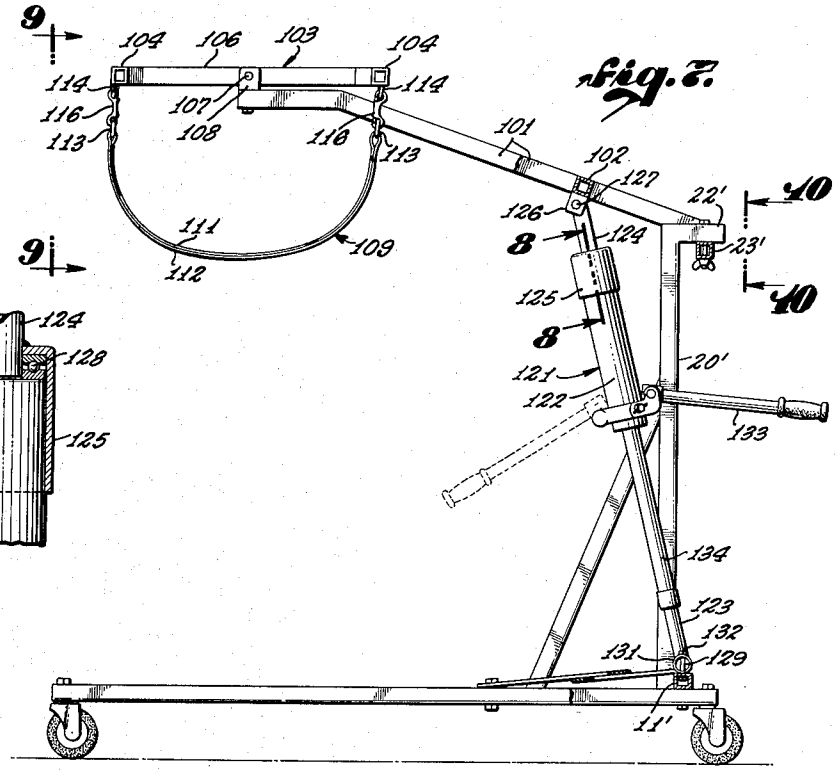


Fig. 8.

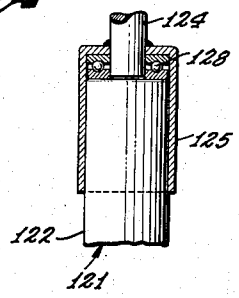


Fig. 9.

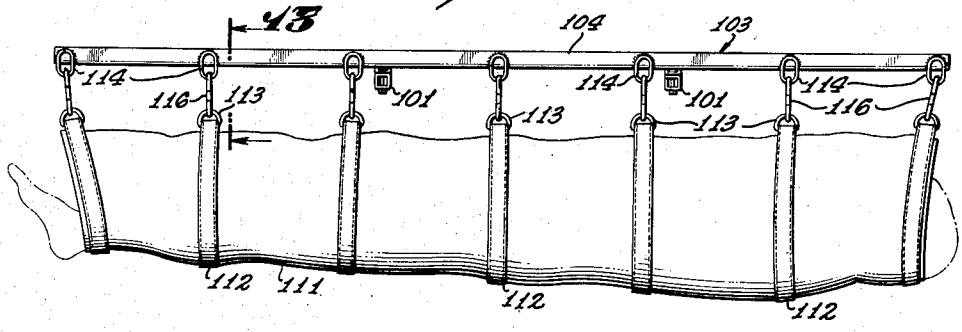
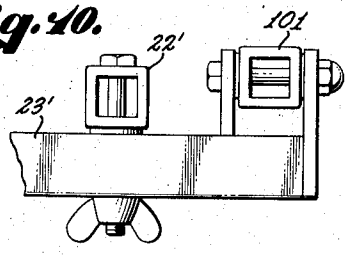


Fig. 10.



CARL R. FLANDRICK,
INVENTOR.

HUEBNER, BEEHLER,
WORREL & HERZIG,
ATTORNEYS.

BY Herbert A. Huebner

Sept. 8, 1959 C. R. FLANDRICK 2,903,238

INVALID LIFTING AND TRANSPORTING APPARATUS

Filed Jan. 21, 1954 4 Sheets-Sheet 4

Fig. 11.

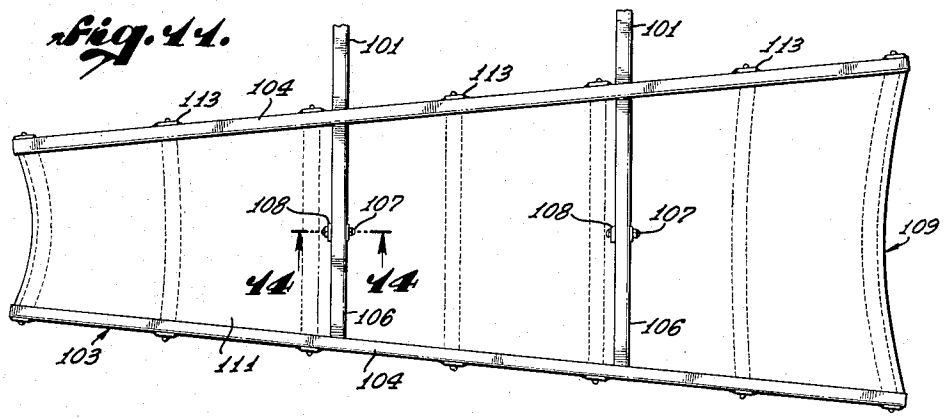


Fig. 12.

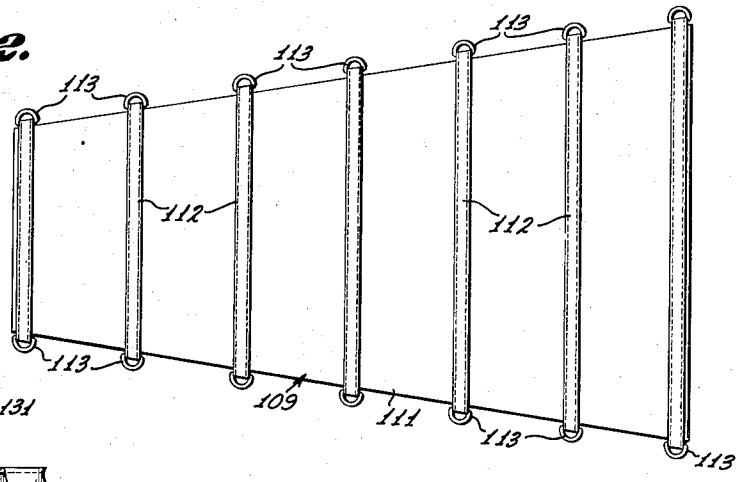


Fig. 15.

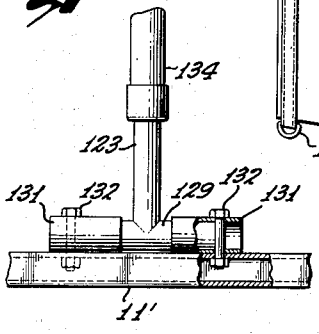
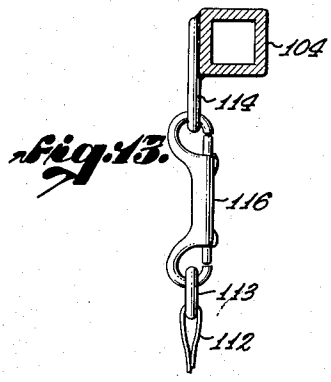


Fig. 13.



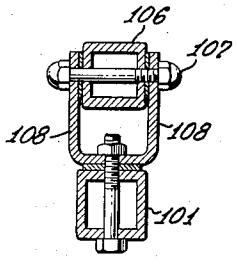


Fig. 14.

CARL R. FLANDRICK,
INVENTOR.

HUEBNER, BEEHLER,
WORREL & HERZIG,
ATTORNEYS.

BY

Herbert A. Huebner

United States Patent Office

2,903,238

Patented Sept. 8, 1959

2,903,238

INVALID LIFTING AND TRANSPORTING APPARATUS

Carl R. Flandrick, Los Angeles, Calif.

Application January 21, 1954, Serial No. 405,350

2 Claims. (Cl. 254—124)

This invention relates generally to invalid lifting and transporting apparatus especially adapted for properly and gently handling patients who are sick, injured, or otherwise incapacitated, and for efficiently servicing such invalids.

More specifically, the present invention is directed to certain improvements in the type of apparatus illustrated and described in my pending application Serial No. 352,329, filed May 1, 1953, now abandoned, in which application there is disclosed a supporting structure including a base and an upright frame having pivoted thereon a rearwardly extending more or less horizontal boom provided at its free aft end with a depending invalid carrying means and having associated with the boom an actuating jack mounted directly below said boom on a support beam forming a part of the upper portion of said frame.

While the actuating jack, thus positioned, has a stroke capacity adequate for the purpose of lifting or lowering an invalid from or to a bed or other article of furniture or equipment, it has been found desirable to provide an improved apparatus that will permit the employment of a jack of greater stroke capacity so that the use of the apparatus may be enlarged to include the lifting or lowering of the invalid directly from or to the floor or the ground.

Said prior application also discloses a pliable invalid seat suspended on opposed sets of chains engaging the corners and side marginal edges of said seat.

It has been found that such seat, when occupied, exerts an appreciable inward pressure on the hips and thighs of the invalid tending to force the thighs together, this being particularly severe when the invalid is heavy.

Since this condition is unsatisfactory in the handling of invalids having certain ailments or injuries and is, from a medical standpoint, highly undesirable in many other instances, it is of importance to provide an improved invalid seat in the use of which the thighs of the invalid will be somewhat separated or at least relieved of any inward pressure.

Therefore, it is an object of the present invention to provide an improved invalid lifting and transporting apparatus capable of lifting or lowering an invalid from or to the floor or from or to the ground.

A further object is to provide an improved invalid supporting seat formed of pliable material and carried by suspension means in such manner as to maintain the thighs of the invalid somewhat separated and free from inward pressure tending to force the thighs together.

Another object is to provide an improved structure which will eliminate many of the parts of the apparatus disclosed in my prior application above identified.

An additional object is to provide in a device of the character set forth a convenient means for widening the base portion of the lift or making it narrower.

In some instances the patient to be moved is so incapable of supporting himself that he is unable to sit up even with the considerable support of an invalid seat, such as mentioned hereinbefore. In such cases it is desirable to provide a means for lifting and moving a patient in a completely prone position, in which case no rigidity of the patient's body whatever is relied on. It is accordingly a further object of this invention to provide a lifting and carrying apparatus of the type described above, by means of which the body of a patient may be lifted and carried in prone position.

It is a further object of this invention to provide a lifting and carrying apparatus which supports a prone body throughout its entire length.

It is a further object of this invention to provide a carrier that conforms closely to the general shape of a prone human in order to comfortably and adequately support such body.

In certain cases, particularly where the patient has considerable use of his hands and arms, it is desirable to provide a means whereby such patients may themselves operate the lifting and lowering mechanism associated with the apparatus. It is accordingly an object of the present invention to provide a lifting mechanism for a carrier of the type described, which can be readily operated from a number of positions, particularly one which can be operated either by the patient himself, or alternatively by an attendant standing beside the transporting apparatus.

It is a further object of this invention to provide a lifting mechanism for a carrier apparatus of the foregoing type, in which lubricated parts are in relatively sheltered positions, thereby minimizing the danger of soiling clothing or bed clothes by contact thereof with such oily, lubricated parts.

Various other objects and advantages will be more fully apparent from the following description with reference to the accompanying drawings which form a part of this disclosure and which illustrate preferred forms or embodiments of the invention.

In the drawings:

Fig. 1 is a perspective view of my improved apparatus.

Fig. 2 is a side elevation thereof.

Fig. 3 is a plan view, partly in section, taken on the line 3—3 of Fig. 2.

Fig. 4 is a plan view of the seating element of the apparatus.

Fig. 5 is a bottom plan view of the forward base portion of the apparatus, illustrating a form of the device in which the base may be readily made wider or narrower by turning a crank.

Fig. 6 is a fragmentary cross section taken on the line 6—6 of Fig. 5.

Fig. 7 is a side elevation of a modified form of the present invention with certain parts broken away for clarity.

Fig. 8 is a vertical fragmentary section taken on line 8—8 of Fig. 7.

Fig. 9 is an end elevation of a portion of the apparatus, taken along line 9—9 in Fig. 7.

Fig. 10 is an enlarged fragmentary elevation taken on line 10—10 in Fig. 7.

Fig. 11 is a top plan view showing the carrier frame portion of the present invention and its depending sling.

Fig. 12 is a plan view of the sling employed in the present invention as it is laid flat on a floor. Fig. 12 is on a slightly smaller scale than Fig. 11.

Fig. 13 is an enlarged fragmentary sectional elevation taken on line 13—13 in Fig. 9.

Fig. 14 is an enlarged fragmentary sectional elevation taken on line 14—14 in Fig. 11.

Fig. 15 is a fragmentary elevation taken from the right side in Fig. 7.

In general terms, the improved apparatus comprises a wheeled base and an upright frame structure which pivotally supports a generally horizontal boom or arm that extends rearwardly to overhang said base and carries at its free aft end a depending invalid seating means, with said boom being operatively associated with an elongated jack carried by said base.

More specifically the supporting framework comprises, essentially, a base portion and upright side frames joined by suitable spacer bars to provide a rigid structure. Said

base portion consists of two relatively spaced horizontal base rails **10** which are pivotally connected to the respective ends of a lower transverse spacer bar **11**, preferably by bolts **12** and associated wing nuts **13**. The base rails **10**, at both ends, are provided with depending pivotally mounted caster wheels **14**. Disposed between these base rails and the lower spacer bar **11** is a stabilizing means comprising two diagonal brace members **15** and **16**, each having one end pivotally connected at **17** to one of the base rails **10**. These brace members cross each other so that their forward ends rest upon the opposite ends of the lower spacer bar **11**, as shown in Fig .3, and said forward end of each brace member is provided with a series of relatively spaced holes **18** to be selectively engaged by a wing screw **19** which engages in a suitable tapped hole formed in the spacer bar **11**. The purpose and operation of this stabilizing means will be later explained.

Extending upwardly from the forward portions of the respective base rails **10** are opposed upright side frames each comprising a vertical leg **20** and a somewhat shorter angled leg **21** connected together and to the respective base rail by welding or otherwise.

The upper end of each side frame leg **20** extends forwardly to form a head **22**, and joining these head members **22** of the opposed side frames is an upper transverse spacer bar **23**, the outer ends of which are pivotally connected to the respective adjacent head members **22** preferably by bolts **24** and associated wing nuts **25**. It will be noted that the upper pivot bolts **24** are vertically aligned with the lower pivot bolts **12** so as to provide true hinge connections between the two side frames of the supporting framework when the wing nuts are backed off.

Disposed upon the medial portion of the upper spacer bar **23** there are provided relatively spaced upstanding ears **30**. The forward end of a generally horizontally disposed boom **31** is positioned between the ears **30** and is pivotally connected thereto by a pivot bolt **32** extending through both ears and through said boom and held in place, preferably by a suitable nut **33**.

At the rear free end of the boom **31** is a cross bar **34** pivoted at its center by a bolt **35** extending vertically through said bar and said boom so that the bar may swing about a vertical axis. The opposite ends of the cross bar **34** are provided with hand grips **36** and adjacent the respective hand grips said cross bar is provided with clevis fittings **37**, while the pivot bolt **35** is provided with a clevis head **38**, as shown in Fig. 1, said clevis head **38** and said clevis fittings **37** providing means for attachment to said cross bar of the depending chains which support the patient carrying means of the apparatus.

Such patient carrying means comprises a patient support **40** which may be of the general configuration shown in Fig. 4 to provide a seat portion **41** having a service opening **42**, and to provide a back portion **43** having laterally extending tabs **44**.

Although this patient support may be made of any strong pliable material, I prefer to use for this purpose a relatively strong canvas which can be easily laundered.

I prefer to reinforce the tabs **44** and the corners and front edge of the seat portion **41** and to provide in each tab and in each corner of the seat portion a hole reinforced by a grommet **46**. An additional hole is formed in the front edge portion of the seat midway between the adjacent corners thereof and this hole is also reinforced by a similar grommet **46**.

Suspension means or chains **47**, **48** and **49** are attached to the respective clevis fittings **37** of the cross bar **34**, and a center chain **50** is attached to the clevis head **38** of the pivot bolt **35** of said cross bar, each of said chains at its end being provided with a safety hook **51** which may be of any preferred type or of the well known latch type shown.

In attaching the patient support **40** to the depending chains, the front chains **47** will be attached to the opposite front corners of the seat portion **41**, the intermediate chains **48** will be attached to the rear corners of said seat portion, the rear chains **49** will be attached to the opposite tabs **44** of the back portion **43**, and the center chain **50** will be attached to the medial front edge portion of the seat to extend between the legs of the patient, as shown in Fig. 1 of the drawings.

When this patient supporting means is occupied it will, due to its pliable nature and to the weight of the patient, closely hug the thighs, the hips, the buttock, the back, and the sides of the torso of the patient and will thus conform perfectly with the natural contour of these portions of the patient's body. This contributes greatly to the comfort and safety of the patient and, from a medical stand point, is of special value in relieving the patient of strain or of exerting himself in anyway.

Contributing further to the safety and comfort of the patient is the center chain **50** which holds up the medial front edge portion of the seat and causes said seat to assume such shape as to provide substantially separate adjacent depressions each supporting one leg, thigh and buttock of the patient. Such arrangement is of particular value in allowing the thighs of the seated patient to remain somewhat separated in a natural manner and in preventing the seat from exerting any appreciable inward pressure tending to force the thighs together. The chain **50** also serves as a valuable safety measure in that it virtually precludes the patient from slipping forwardly out of the support **40**.

For the purpose of actuating the boom **31** to raise and lower the patient, I provide a hydraulic jack **60** which may be any one of several well-known types now on the market.

The jack which I have illustrated is of the elongated type having a relatively long operating stroke and comprising a generally vertically disposed cylinder **61** containing a fluid and a piston (not shown) attached to a piston rod **62** projecting upwardly through suitable packing and terminating with an upper end which is pivotally connected at **63** to the boom **31** aft of the pivot **32** thereof, as shown in Figs. 1 and 2.

The hydraulic jack **60** is vertically aligned with the boom **31** and is pivotally mounted at **64** on the medial portion of the lower spacer bar **11** of the base structure of the apparatus and is provided with suitable actuating mechanism, indicated generally by the reference numeral **65**. Such mechanism includes an actuating lever **66** and a release valve **67**.

It will be obvious that by actuating the hydraulic jack, the patient may be raised or lowered, and with particular reference to Fig. 2 of the drawings, it will be noted that, by use of the long stroke jack illustrated, the patient may be raised from or lowered to the floor or to the ground, as indicated in dotted lines. This is made possible by mounting said jack directly on the base structure instead of on the upper portion of the frame structure as in my prior application.

In certain instances the apparatus may be used in situations not requiring the passage thereof through any narrow doorways or passageways, and in such use it will be desirable to so adjust the apparatus, before use, as to provide an extended base of increased stability. Also the extended base is useful in straddling a bathtub, table, or some other object on which the patient is to be lowered.

This is accomplished by first removing the wing screws **19** to free the forward ends of the two diagonal brace members **15** and **16** of the base structure, by loosening the wing nuts **13** and **25** of the upper and lower spacer bars **11** and **23**, and then spreading apart the opposed base rails **10** and their associated side frames to angular positions, as shown by dotted lines in Fig. 3, the base rails and side frames, during this spreading adjustment, pivoting upon the aligned pivot bolts **12** and **24**.

When the apparatus is thus adjusted, the wing nuts **13**

and 25 will be tightened and the wing screws 19 will be inserted through the appropriate holes 18 of the diagonal brace members 15 and 16 and into the tapped holes of the lower spacer bar 11 and then tightened, so as to make the entire framework a rigid structure.

In instances wherein it is intended to deposit the lifted patient in a wheel chair, rocking chair, or any other form of relatively wide seat, the apparatus may be preadjusted in the above described manner so that the wheel chair or such other form of seat may be inserted directly under the patient between the spread side rails of the base of the framework.

In the use of my apparatus for the purpose of lifting a patient from a bed, for instance, the canvas patient supporting member 40 is detached from the chain hooks and is slid under the patient. The wheeled carrier is then brought up to the side of the bed with its two side rails 10 projecting under the bed and its boom 31 suitably lowered to permit the chain hooks 51 being engaged in the respective grommets of the canvas support and with its cross bar 34 rotated to transverse position above the patient. To lift the patient the attendant or nurse will actuate the hydraulic jack 60 by means of the operating handle 66 and when the patient is lifted free of the bed, the apparatus will be moved away from the bed, and the suspended patient, together with the cross bar 34, will be rotated on the pivot bolt 35 to bring the patient to a position facing the front of the wheeled carrier, as indicated in Figure 1.

When the patient is seated in the apparatus the cross bar 34 and the adjacent end of the boom 31 will be immediately in front of his chest in such position that he may grasp them for moral support or, in the case of a convalescent patient or one who has full and normal use of his arms and hands, he may assist in some of the operations.

If the patient is to remain in the apparatus for an extended length of time, the boom may be lowered by actuation of the release valve 67, until the patient can use the stabilizing brace members 15 and 16 for a foot rest.

From the above it will be quite obvious that, if the apparatus is to be employed to transport a patient through relatively narrow doorways or passages, it will then be adjusted to bring its base rails and side frames closer together as shown in full lines in Figure 2.

A patient clothed in a nightgown, or a hospital gown, may, by the use of my apparatus and without leaving the canvas seat thereof, be lifted from a bed, transported to a toilet, lowered with said seat upon the toilet seat and be subsequently lifted and transported back to the bed and lowered thereon.

In the use of my apparatus for the purpose of loading a patient into an automobile through a doorway thereof, the patient, after being lifted by the apparatus as above explained, will be transported to the side of the automobile to a position aligning the apparatus with the doorway. The apparatus will then be pushed forward to project the ends of the base rails beneath the car and to transport the patient through the car doorway and into the car to a position directly above the car seat where he can easily and gently be lowered onto the seat.

In all of the above described uses and in such other uses for which my improved lifting and transporting apparatus may be employed, all of the operations thereof will be evenly and smoothly accomplished without hazard and in a manner devoid of cyclic or other irritating noises.

The described apparatus may easily and quickly be dismantled by disconnecting the chain hooks from the canvas seat, by removing the wing screws 19, and by removing the several wing nuts and their associated bolts, and by then securing the several parts in a compact bundle.

It will be noted that the structure is relatively low, without overhead framework or other obstructions, that the boom is conveniently projected clear of its supporting and operating mechanism.

The mechanism shown in Figures 5 and 6 provides for making the base wider or narrower by means more conveniently operated than by the adjustment of the diagonal brace members 15 and 16, and is being currently employed in the commercial devices embodying the invention.

On the spacer bar 11 is fixed a nut 65, through which passes a threaded rod 66' terminating at its forward end in a crank 67. The rear end of the rod 66' is coupled to diagonal control bars 70 and 71 which are pivotally connected to the base rails 10 at 72 and 73. The coupling, designated 73, comprises a sleeve 74 freely encompassing the rod 66', and held against longitudinal movement relative to the rod by opposing pairs of lock nuts 75 and 76. Pivot pins 77 and 78 connect the bars 70 and 71 to the sleeve.

When the crank is turned in a clockwise direction, assuming a right hand thread on the rod 66', the forward ends of the bars 70 and 71 are pushed rearwardly, which results in the rear ends of these bars moving outwardly at the pivot means 72 and 73, consequently spreading the base rails 10 which are pivoted at 12 to the spacer bar 11. When the crank is turned anti-clockwise, the base rails pivot inwardly, thus narrowing the base. The end result is the same as illustrated in Figure 3.

In Figs. 7–14 there is shown a second embodiment of the present invention, this embodiment having a flexible carrier portion which is especially suited for transporting a patient in prone position, in contrast to a seated position, as shown in the first embodiment herein described. In addition, this second embodiment incorporates a modified form of hydraulic jack, which is especially suited for use on a carrier which is to be used alternatively with either the seat type carrier or the prone type carrier.

Referring to Fig. 7, in particular, the embodiment here shown incorporates a wheeled base member substantially identical with that shown in Fig. 1. To the upper spacer bar 23' in Fig. 7 are pivotally secured a pair of parallel booms 101 secured to the bar 23' by upstanding ears in the same manner as the boom 31 is secured to the bar 23 in Fig. 1. The booms 101 are substantially identical to the single boom 31 of Fig. 1 and are spanned by a rigid cross beam 102.

To the extended ends of the booms 101 is secured a substantially horizontal carrier frame 103 comprised essentially of converging longitudinal members 104 connected together by cross members 106. The cross members 106 are parallel to and spaced immediately above the booms 101, and are pivotally connected thereto by pivot pins 107 (Fig. 14), which pass through upstanding ears 108 secured on the ends of the booms 101, and through the cross members 106.

Pendent from the longitudinal arms 104 of the carrier 103 is a tapered sling 109 (Fig. 12) composed primarily of a sheet of flexible material 111 such as canvas, plastic, or the like. The sheet 111 is strengthened by a plurality of cross straps 112 secured thereto, to the ends of which are affixed securing rings 113. In use the rings 113 of the sling 109 are linked to a corresponding plurality of rings 114 on the frame 103, through the intermediacy of a corresponding plurality of harness snaps 116, as shown particularly in Fig. 13.

The sling 109 is approximately 60 inches long, 36 inches wide at the head end, and 18 inches wide at the foot end, so as to conform itself generally to the shape of a prone human body when the sling is secured in pendent fashion from the carrier frame 103, as shown in Figs. 7 and 9.

This second embodiment of the present invention incorporates a second form of lifting mechanism, shown generally at 121 in Fig. 7. The lifting mechanism comprises essentially a hydraulic cylinder 122, from the lower end of which projects a piston rod 123. The upper end of the cylinder 122 is journalled, for rotation about the axis of the cylinder, in a cup-like sleeve 125, from the upper end of which projects a connecting rod 124. The upper end of the rod 124 is pivotally secured to the mid-

point of the cross beam 102 by means of a pair of ears 126 depending from the cross beam 102, and a pivot pin 127 passing through the ears 126 and the rod 124. A thrust bearing 128 is interposed between the upper end of the cylinder 122 and the cup-like sleeve 125, in order to absorb the thrust between the beams 101 and associated load, and the cylinder 122.

The lower end of the piston rod 123 is formed with a horizontal T section 129 (Fig. 15) the ends of which are journalled in spaced aligned bearings 131 secured atop the lower spacer bar 11' by means of securing bolts 132.

The lifting mechanism 121 is provided with an operating pump handle 133 by means of which the hydraulic cylinder 122 may be operated to raise and lower the boom 101 and the carrier 103. Since the piston 123 is inherently rotatable with respect to the cylinder 122, and since the cylinder 122 is mounted rotatably with respect to the connecting rod 124 by virtue of the sleeve 125, the handle 133 may be moved, by rotation about the cylinder axis, to either the outside position of the vertical frame 20' as shown in solid lines in Fig. 7, or to the inside position as shown in the dotted lines. When in the outside position, shown in Fig. 7, the lifting mechanism is in position to be conveniently actuated by a nurse or other attendant standing beside the lift, while when the handle 133 is in the inner position it may be readily reached by a patient suspended from the boom arms, particularly when such a patient is suspended from the seat type carrier 40 shown in Fig. 1.

In this connection it may be noted that either form of lifting mechanism shown at 60 or at 121 in Figs. 1 and 7, respectively, may be used with either type of boom suspension shown in Fig. 1 or Fig. 7. In practice it is usually preferred to use the mechanism 121 on all types of carriers, since this renders the carriers suitable for use by a patient who can himself operate the lift mechanism, as shown in Fig. 1; or alternatively, for the prone type of patient who must use the sling 109 and who consequently can not himself operate the lift except in unusual circumstances.

A protecting sleeve 134 depends from the cylinder 122 circumjacent the extended rod 123 for an appreciable portion of its free distance. This sleeve serves to cover the oily rod 123, and thus all parts of the lifting mechanism 121 which might tend to become dirty from lubricating grease are shielded from contact by users of the apparatus, except the lowermost exposed portion of the rod 123, which is necessary to provide an operating range for reciprocation of the lifting mechanism.

Use of the apparatus shown in Fig. 7 may be exemplified as follows. To move a prone patient from a bed, it is simply necessary for the attendant or nurse to manipulate the sling 109 under the bed-ridden patient, using well-known hospital techniques for changing sheets or bedding. The carrier is then moved into position so that the booms 101 and carrier frame 103 are over the prone patient. The side edges of the sling 109 are folded up around the sides of the patient, as shown in Fig. 9, and the sling 109 is secured to the frame 103 by means of the harness snaps 116.

The lifting apparatus 121 is then operated by the handle 133, causing the sling 109 to be lifted, thus raising the patient off the bed. When the patient is free of the bed, the carrier is wheeled away from the bed and the patient is transported to an operating table, respirator, or other apparatus.

While it is preferred to use diverging longitudinal members 104 in the frame 103, a satisfactory support may be provided by parallel members. Also, a single cross beam 106 could be employed in the carrier 103 in association with a single beam 101, but it is preferred to use a plurality of supports for stability to prevent undue rocking of the carrier and sling.

While the structures herein illustrated and described are fully capable of fulfilling all of the objects primarily stated, it is to be understood that I do not wish to restrict the present invention to the specific embodiments herein disclosed for it is susceptible of embodiment in various other forms, all coming within the scope of the claims, which follow.

What I claim as new and desire to secure by Letters Patent is:

1. An invalid lift comprising a base including a pair of horizontal rails each having a caster wheel at each end thereof, and a transverse spacer bar having a pivot connection at each end thereof with respective ends of the rails, a pair of adjustable diagonal cross brace members, one end of each brace member having a pivotal connection to one of the rails at a location rearwardly removed from the spacer bar, the other end of each brace member having a pivotal connection to the base adjacent the end of the spacer bar and on the opposite side of the base from the other end of the respective brace member, one end of each brace member having a plurality of points of attachment whereby to enable varying the spread of said base rails, an upwardly extending frame on the base adjacent the spacer bar, a boom pivotally mounted on the frame and extending over the base, a connection on the boom and a connection on the spacer bar, a jack means comprising a cylinder and a reciprocating piston, said piston being attached to one of said connections and said cylinder being pivotally attached to the other of said connections, and an operating handle pivotally mounted on a horizontal axis on the cylinder adapted to be movable in a generally horizontal plane with said cylinder to convenient positions of operation.

2. In an invalid lift comprising a base having two ends, an upright portion positioned at one end of said base, an overhanging boom having one end pivotally mounted to said upright portion and another end free and extending over said base and terminating intermediate the two ends of said base, and a sling secured to said boom at the free end of said boom, the combination of jack means comprising a generally vertical cylinder having a reciprocal piston rod extending downwardly therefrom, the lower end of said rod being pivotally mounted to said base, a sleeve capping said cylinder at its upper end, said cylinder being rotatably mounted in said sleeve, a connecting member having an upper end pivotally mounted on said overhanging boom rearwardly of said upright portion, and a lower end secured to said sleeve capping said cylinder, said cylinder including an actuating pump handle pivotally mounted to said cylinder and said handle being rotatable with said cylinder about the axis of said cylinder in a generally horizontal plane for manual access at different positions for oscillating said handle.

References Cited in the file of this patent

UNITED STATES PATENTS

780,820	Schwerin	Jan. 14, 1905
1,876,832	Bancroft	Sept. 13, 1932
1,962,042	Stevenson	June 5, 1934
1,971,294	Bunker	Aug. 21, 1934
2,517,813	Wallace	Aug. 8, 1950
2,527,841	Mueller	Oct. 31, 1950
2,549,120	Ormsby	Apr. 17, 1951
2,585,982	Wood	Feb. 19, 1952
2,595,651	Feist	May 6, 1952
2,675,209	Freed	Apr. 13, 1954
2,739,783	Pentecost	Mar. 27, 1956

FOREIGN PATENTS

301,958	Great Britain	Dec. 10, 1928

OTHER REFERENCES

Casket and Sunnyside: article on Stratton Hydrocrane, pages 6 and 7, Aug 11, 1950. Copy in Div. 8.)