

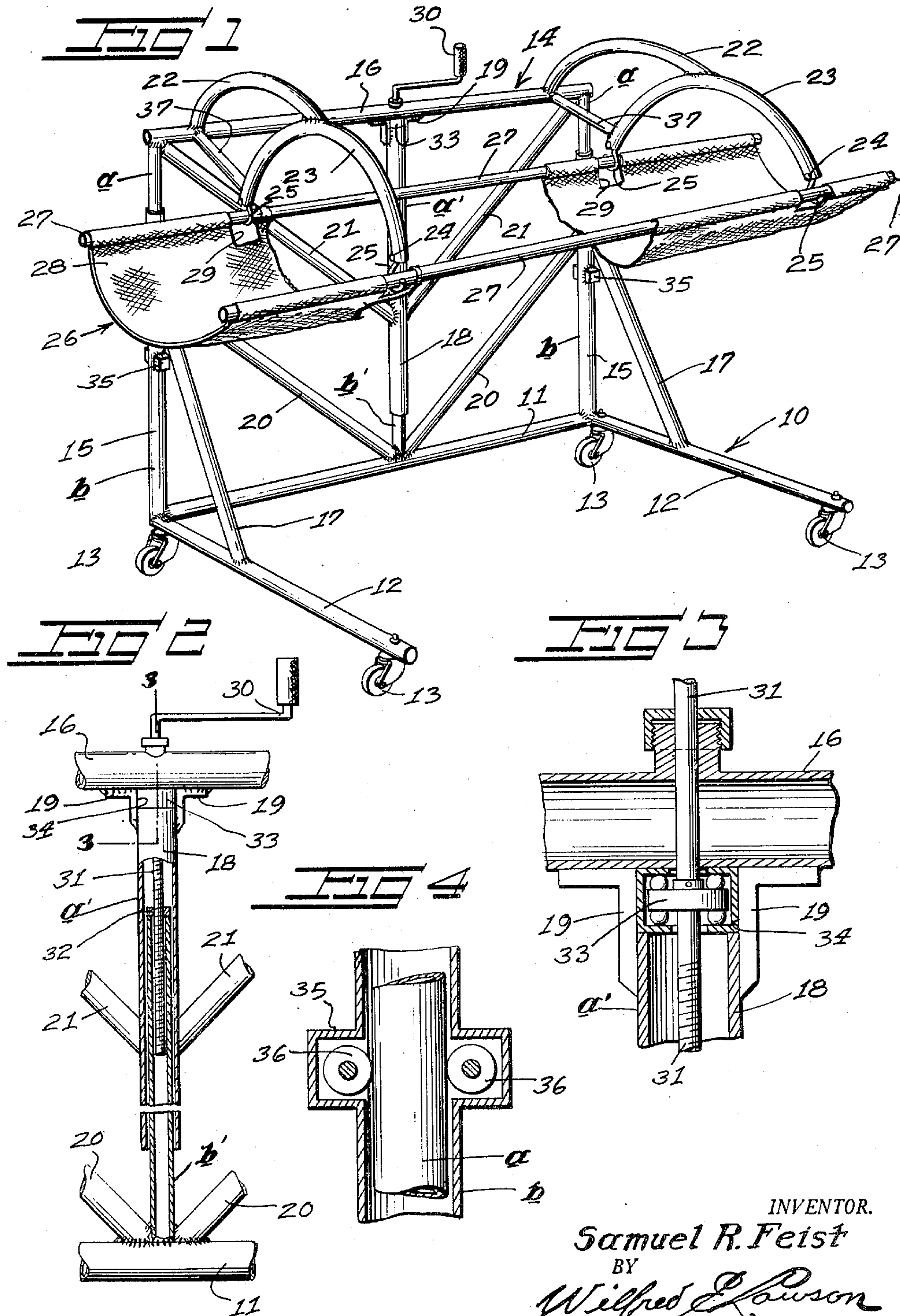
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CARRIAGE AND LIFT APPARATUS

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CARRIAGE AND LIFT APPARATUS

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This invention relates generally to a lifting apparatus designed primarily for use in lifting and moving invalids or injured persons.

A principal object of the present invention is to provide an apparatus of this character which is of relatively light construction and which can be easily moved from place to place either when loaded or unloaded and also is of such form that it may be run into a position, with respect to a bed, whereby an ill or injured person can be placed directly on the bed or raised therefrom with a minimum of disturbance.

Still another object of the invention is to provide a carriage and lift apparatus of the character herein disclosed whereby an injured or ill person may be raised and lowered easily and smoothly without shocks or jars.

A further and more specific object of the invention is to provide an apparatus of the character stated wherein a supporting frame, formed in two sections which are relatively movable, includes telescoping parts with a novel and improved anti-friction means between the telescoping parts which will permit the device to be raised and lowered smoothly and without binding or jamming.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of the specification, with the understanding, however, that the invention is not to be limited to the exact details of construction shown and described since obvious modifications will occur to a person skilled in the art.

In the drawing:

Figure 1 is a view in perspective, with portions broken away, of a lift apparatus constructed in accordance with the present invention.

Figure 2 is a detail view partly in elevation and partly in section of the central part of the vertical frame of the apparatus.

Figure 3 is a sectional view taken substantially on the line 3—3 of Figure 2.

Figure 4 is a fragmentary sectional detail through two bearing elements and adjacent part of a standard of which they form a part.

Referring more particularly to the drawing the numeral 10 generally designates the base portion of the present lift apparatus, which base portion comprises a longitudinally extending side rail 11 and the two spaced parallel transverse rails 12 extending at right angles therefrom across the width of the structure. This base frame is supported upon suitable caster wheels 13 which, as shown, are attached to the transverse rails 12 at the ends thereof.

At the side of the base structure 10 is the vertical frame 14 which is in the same vertical plane as the longitudinal side rail 11. The upright side frame 14, which is vertically extensible, includes as a part thereof the bottom

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rail 11. From each of the two ends of the bottom rail 11 extend the upright or vertical standards 15 which are in two telescoping parts *a* and *b*.

The top ends of the standards 15 are connected by the top horizontal rail 16 and this rail, as shown, is integral with the upper ends of the sections *a* of the standards while the sections *b* are integral with the base rail 11, the sections *a* being slidable into the upper ends of the sections *b*.

Extending downwardly and inwardly from the upper ends of the lower sections *b* of the standards are the bracing struts 17 which are secured to the transverse rails 12 at a substantial distance inwardly from the longitudinal side rail 11.

In addition to the end standards 15 there is the central standard 18 which comprises the telescopically joined upper and lower sections *a'* and *b'*. The lower section *b'* is secured rigidly to the longitudinal base rail 11 centrally of its ends while the upper section *a'* is joined to the underside of the top rail 16 in spaced relation therewith. The means here shown for joining the upper section *a'* to the top rail comprises the two angle brackets 19 which are welded between the rail 16 and the section *a'* but it will be obvious that other means may be employed for securing the parts in this relation.

In order that the vertical frame structure 14 may have a maximum of strength and rigidity there are provided the lower bracing struts 20 which are connected between the lower end of the lower section *b'* of the center standard and the upper ends of the lower sections *b* of the adjacent standards 15. Above the struts 20 are corresponding bracing struts 21 which extend downwardly and inwardly from the upper ends of the sections *a* of the standards 15 to the lower part of the section *a'* of the central standard to which they are firmly joined as illustrated.

At each end of the top rail 16 there is secured an end of an arched supporting arm 22 which projects inwardly to lie above the central part of the base frame 10. Rigidly secured to the inner end of each arm 22 is an arcuate yoke 23, the concave side of which is directed downwardly as shown. The arms 22 are attached to the top sides of the yokes 23 substantially midway between the ends of the latter and it will be seen that the rail 16, the arms 22 and the suspending yokes 23 are all joined together to form a rigid unit.

The depending free ends of each of the yokes 23 have secured thereacross the pivot pins 24 and each pivot pin has pivotally attached thereto a hanger hook 25.

The numeral 26 generally designates a carrier or stretcher which comprises the spaced side rails 27 between which is connected the fabric body 28. At properly spaced points the fabric body is

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provided with the openings 29 whereby the hooks 25 may be engaged around the stretcher rails 27 thereby horizontally suspending the stretcher from the arched frames or yokes 23 in the manner shown.

Raising and lowering of the upper part of the vertical side frame 14, which upper part includes the horizontal top rail 16 and the parts a, a', 21, 22, and 23, is effected by means of the crank 30 which is connected with the upper end of a lifting screw 31 which extends downwardly through the tubular portion a' of the central standard 18 and is threadably engaged in a nut 32 secured to the upper end of the lower portion b' of the standard 18. The upper end of the screw 31 is connected with a thrust bearing 33 which is held in a space 34 provided between the upper end of the portion a' of a central standard 18 and the overlying horizontal rail 16.

In order to effect movement of the end standard parts a with a minimum of friction in the lower parts b, rotatable anti-friction units are supported within the offset receptacles 35 which form a part of the lower part or section b of each end standard. These receptacles 35 open inwardly toward the inserted upper part a of the standard and have rotatably supported therein the bearing units or elements 36 between which the standard part a moves. These bearings 36 are in opposed relation and are disposed upon the inner and outer sides of the end standards and two sets of such bearings are preferably provided.

In order to add stability to the arched frames or yokes each has rigidly connected between the end thereof which is adjacent to the vertical frame and the horizontal rail 16, the short brace arm 37.

From the foregoing it is believed that it will be readily apparent that a lift apparatus constructed in accordance with the present invention may be easily and quickly placed in position with respect to a bed or other similar structure upon which a patient may be resting and lowered and/or raised smoothly and easily for the purpose of moving a sick or injured person. The construction and arrangement of the parts are such that after the patient has been raised the apparatus can be moved about easily without danger of tipping or upsetting.

By the provision of the bearings in the lower portions b of the end standards, the upper portions a of such standards can be made to shift without binding, regardless of the weight carried by the stretcher unit.

I claim:

1. A lift and carrier structure of the character described, comprising a base frame, a vertical frame supported upon the base frame at one side of the latter, said vertical frame including sectional telescoping standards and a connecting horizontal top rail, a pair of arched rigid arms rigidly secured to said horizontal rail and extending over the base frame, an arched suspension yoke secured to each of said arms and having downwardly directed end portions, means for attaching an invalid supporting unit to the depending arms of the said yokes, and means connected between a side of the base frame and the top rail of the vertical frame for effecting the raising and lowering of the horizontal rail of the base frame together with the arms and yokes.

2. A lift and carrier structure of the character described, comprising a base frame, a vertical side frame supported at one side of the base

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frame, the side frame including sectional telescoping standards and a horizontal top rail, said top rail being connected between two sections of two remote standards and a section of an intermediate standard, said intermediate standard having its sections of hollow construction and one thereof being rigidly fixed to the bottom frame, a screw rotatably carried by said horizontal rail and extending downwardly through the two sections of the intermediate standard, the lower section of the intermediate standard having a nut fixed thereto through which said screw is threaded, means for rotating said screw, and a pair of supports rigidly secured to the top part of the vertical frame and extending laterally therefrom over the base frame, said supports being adapted for connection with a stretcher.

3. A lift and carrier structure of the character described in claim 2, wherein each of said supporting units comprises a rigid arched arm secured at one end to said top rail and an arcuate yoke connected intermediate its ends to the other end of the arm, the ends of the arched yokes being directed downwardly and a suspension hook pivotally attached to each end of each arched yoke.

4. A lift and carrier structure of the character described comprising a base frame having a side rail and perpendicular end rails, a vertical frame supported on the base frame in a vertical plane of said side rail, said vertical frame comprising two end standards and a central standard and a horizontal top rail, each of said end standards including a tubular lower section and an upper section slidably extended into the lower section, said top rail being connected with said upper sections, the central standard including a tubular lower section fixed to the side rail of the bottom frame and a tubular upper section fixed to said top rail and slidably receiving the upper end of the adjacent lower section, a thrust bearing carried upon the upper end of the upper section of the central standard, a nut carried upon the upper end of the lower section of the central standard, a relatively long screw extending downwardly through the horizontal rail and having threaded connection with said nut, said screw being connected with the thrust bearing, means upon the upper end of the screw for turning the same, and hanger units rigidly secured to the top rail and extending laterally therefrom over the bottom frame and adapted for connection with and for the support of a stretcher unit.

5. A lift and carrier structure of the character stated in claim 4, wherein each of said suspension units comprises an arcuate arm rigidly attached at one end to the said top rail of the side frame and an arched yoke rigidly joined intermediate its ends to the other end of the arm whereby the ends of the yoke are directed downwardly, and a suspension hook pivotally attached to each end of each yoke.

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