R. L. FLOYD.

DEVICE FOR LIFTING AND MOVING INVALIDS.

APPLICATION FILED NOV. 17, 1914.

1,273,599.

Patented July 23, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

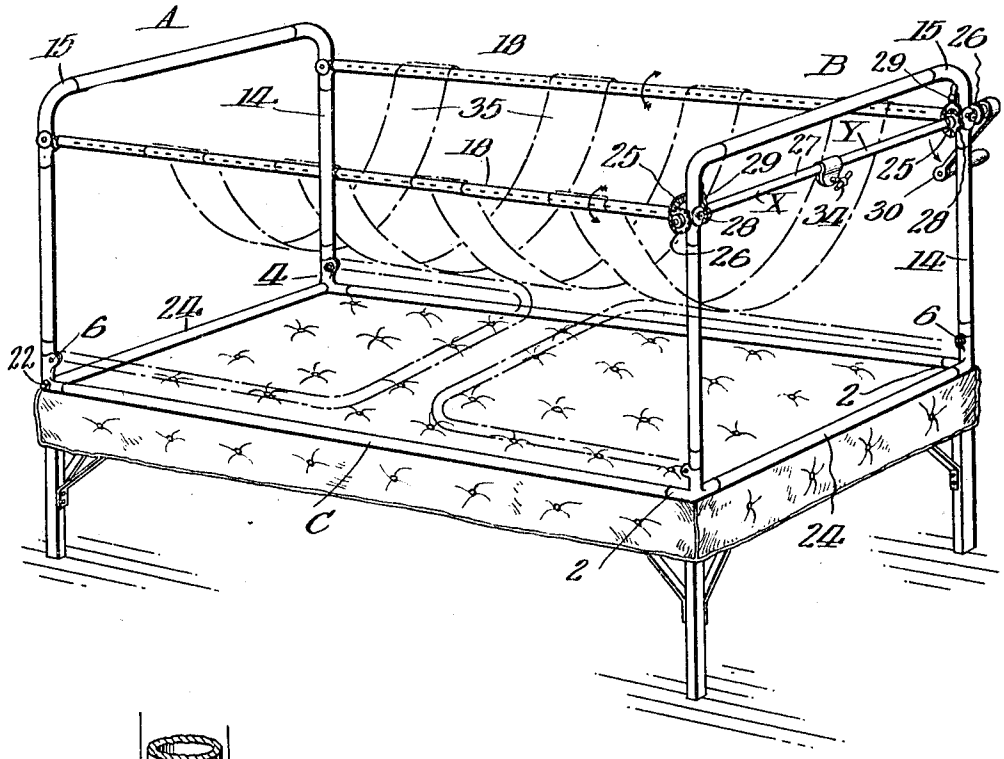


Fig. 2.

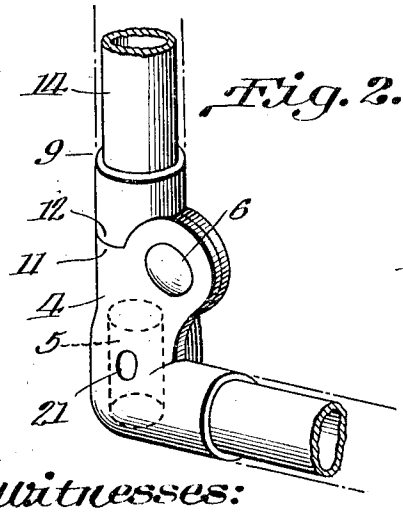
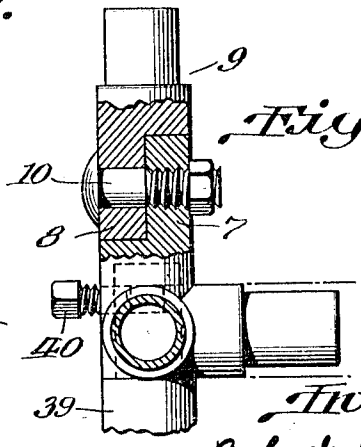


Fig. 3.



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2 SHEETS—SHEET 2.

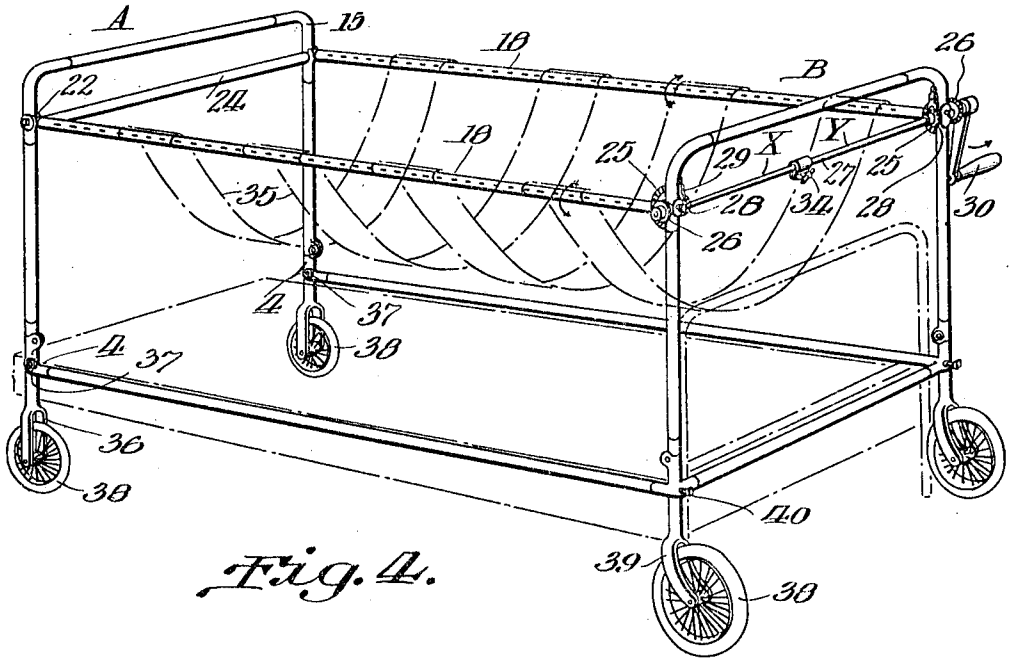


Fig. 4.

Fig. 5.

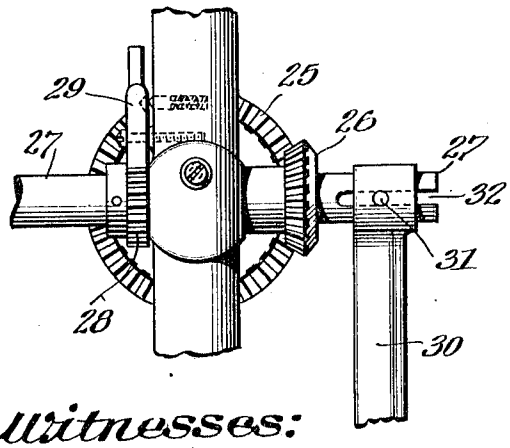
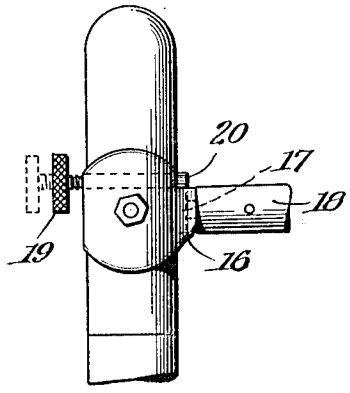


Fig. 6.



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UNITED STATES PATENT OFFICE.

ROBERT L. FLOYD, OF STAUNTON, VIRGINIA, ASSIGNOR TO THE FLOYD INVALID LIFTER COMPANY, OF STAUNTON, VIRGINIA, A CORPORATION OF VIRGINIA.

DEVICE FOR LIFTING AND MOVING INVALIDS.

1,273,599. Specification of Letters Patent. **Patented July 23, 1918.**

Application filed November 17, 1914. Serial No. 872,616.

To all whom it may concern:

Be it known that I, ROBERT L. FLOYD, a citizen of the United States, and a resident of the city of Staunton, in the county of Augusta, State of Virginia, have invented certain new and useful Improvements in Devices for Lifting and Moving Invalids, of which the following is a specification.

This invention relates broadly to lifting devices and more particularly to devices for lifting and moving invalids.

The principal object of this invention consists in improvements upon the device disclosed in my Patent #936,107, patented October 5, 1909.

More especially the object of the present invention is to provide an invalid lifting and moving device having a light rigid metallic frame constructed to maintain the operative parts in proper alinement.

A further object of the present invention is to provide an invalid lifting device of simple mechanism, capable of being assembled, or disassembled without the use of tools, and comprising when assembled a unitary device capable of being bodily located relative to the invalid's bed, to easily and safely lift the invalid from the bed.

The wheeled form of my invention is adapted to lift the invalid from the bed and also to facilitate the transferring of the invalid from one place to another, with a minimum amount of exertion on the part of the attendant, and discomfort on the part of the invalid.

Still other and further objects of this invention will in part be obvious and will in part be pointed out in the specification hereinafter following by reference to the accompanying drawings, in which like parts are represented by like characters throughout the several views thereof.

Figure 1 is a perspective view illustrating a rigid rectangular frame type showing the end arches thereof hinged to the frame.

Fig. 2 is a perspective detail view of a corner hinge.

Fig. 3 is a detail sectional view through the pintle portion of the hinge.

Fig. 4 is a perspective view illustrating a slight modification of the rigid frame device mounted upon large wheeled casters.

Fig. 5 is a detail view showing one of the lifting and holding gear devices.

Fig. 6 is a detail view illustrating a form of construction for the end bearings of the winding or lifting shafts.

Heretofore, the usual practice in lifting or handling practically helpless invalids has been for the attendants to manually lift the invalid, and as it is difficult or substantially impossible to lift the entire body of the invalid at one time, the operation of elevating such a person has been attended with discomfort for the invalid and the exertion of considerable strength on the part of the attendant or attendants. The device disclosed in my Patent #936,107, granted October 5, 1909, obviated these difficulties by performing this work through the aid of machinery. Since this mechanism includes rotating shafts and beveled driving gears, it is necessary that the parts be assembled in substantial or approximate alinement. In practice it has been found that often attendants would not succeed in properly alining the parts when the clamps were placed upon the bed rails, and these difficulties are overcome and obviated by the construction disclosed in the present invention.

Referring now more particularly to Figs. 1 to 3 inclusive, a supporting frame C is preferably of rectangular form and may be composed of seamless steel tubes secured by brazing, spot-welding, or other well known methods, to corner brackets 2 and 4. As shown, the rigid portion C of the main frame is substantially U-shaped. The corner brackets 2 and 4 are recessed as at 5 to form a socket for the attachment of casters, which will be more fully explained hereinafter. The corner brackets may be provided with a hinge 6 composed of a lower leaf 7 integral with the corner brackets, and a corresponding upper leaf 8 integral with the extensions 9. The two leaves preferably are joined together by a shouldered screw bolt 10, which provides a simple and at the same time, secure, bearing or pintle for the hinge. The hinges are provided with abutting shoulders 11 and 12 which act as stops to prevent the hinges from having a movement greater than ninety degrees. Upright members 14, preferably comprising seamless steel tubing, are properly secured upon the extensions 9, and carry at their upper ends corner braces 15, which perform the double function of comprising the corners of the arches A and B and providing an effective bearing for the lifting shafts. More par-

ticularly the corner braces 15 are formed with offset portions 16 which are cupped and provided with an open ended slot which receives the circular heads 17 carried by the ends of the lifting shafts 18. A thumb screw 19 is provided with a cylindrical end 20, which is adapted to be moved in position over the circular head 17 when the thumb screw is operated, thereby effectively locking the lifting shaft 18 in position by retaining the circular head within the open slot. The corner brackets 4 connected with the arch A are substantially L-shaped when the hinge is opened. These corner brackets 4, and also the corner braces 15, are provided with openings 21. Stub bolts 22 may be passed through the openings 21 in the corner brackets 4 and threaded into a tubular bar 24 to retain this bar in position between the corner brackets 4, as is illustrated in Fig. 1.

Referring now more particularly to the arch B disclosed at the right end of Figs. 1 and 4, and to the detail view in Fig. 5, the operating mechanism for the lifting shafts 18 comprises a pair of relatively large beveled gears 25 carried by the ends of the lifting shafts, (which terminate in, and are supported by, substantially the same construction as is disclosed in Fig. 6) with which the beveled pinions 26 are constantly engaged. The beveled pinions are secured upon the driving shaft 27 that is mounted in bearings formed in the corner braces 15 in the supporting arch B. The driving shaft also carries ratchet wheels 28, which enable the driving shaft to be held, by means of the ratchet pawls 29, in any predetermined adjusted position. Preferably the driving handle 30 is provided with a through rivet 31 which is adapted to cooperate with the slots 32 formed in each end of the driving shaft 27 thereby enabling the operating handle 30 to be used on either end of the driving shaft, as is convenient or desirable. The driving shaft, as shown, is formed of two sections X and Y, each of which may rotate independently of the other, and by means of the thumb screw clutch 34 the two sections X and Y of the driving shaft may be clamped securely together so that both sections operate as a single shaft.

As is indicated in Figs. 1 and 4, a plurality of cloth bands 35 are secured upon the lifting shafts 18 in such manner that as these shafts are rotated the cloth bands are wound thereon.

Again referring more particularly to Fig. 1, it will be noted that if the thumb screws 19 be operated to occupy the dotted line position in Fig. 6, the cylindrical end will be withdrawn from its bearing in such manner that the shafts 18 may be removed from position in the supporting bearings. The end arches A and B may then be folded to dotted line position (Fig. 1) and the device may be stored in substantially small compass.

Referring more particularly to Fig. 4, which illustrates my device with wheeled casters, it will be noted that the bar 24 has been removed from between the corner brackets 4 and has been repositioned in the upper portion of the arch A by placing the stub bolts 22 through the openings 21 in the upper corner braces 15.

Straight forks 36 having the upper ends thereof shouldered to fit the recesses in the corner brackets 4 are adjusted therein and secured in position by means of short bolts 37 which are passed through the openings 21 in these brackets and through openings in the ends of the forks. Rubber tired wheels 38 are rotatably mounted within the forks to constitute wheeled supports for the arch A. Curved forks 39, which likewise carry rubber tired wheels 38, are rotatably mounted in the recesses in the corner brackets 2, and may be retained therein by a common expedient such as a set screw 40 which enters the circular groove cut in the shank of the fork. (See Fig. 3.) From the above explanation it will be seen that my device can easily be converted from a non-wheeled into a wheeled device. The effective operation of the device whether wheeled or non-wheeled, is substantially the same, with the exception that the device illustrated in Fig. 1 is placed directly over the patient, after the device has been assembled, and is supported by the frame 1 resting upon the support for the patient, which in hospital work comprises a mattress or frame work of the hospital cot; while with the wheels thereon as illustrated in Fig. 4, it is adapted to be wheeled over the patient or hospital cot to such position as will enable the operating mechanism to be manipulated to properly lift the patient therefrom, and the patient may then be held suspended over the cot, or can be transported to an operating table or to a different cot, or moved in any manner as may be desired. As to the effective operation of the device, the cloth bands 35 are passed beneath the patient and the ends thereof secured to the lifting shafts 18 in the manner illustrated in my Patent #936,107, or in my companion application Serial No. 873,493. If it is desired to lift the patient directly vertical, the thumb screw clutch 34 is tightened and the operating handle 30 is turned in the direction of the arrows. It will be noted that the arrangement of the gearing is such that the lifting shafts 18 will be turned in opposite directions away from the center of the device, as is illustrated by the arrows, and the cloth bands 35 will be wound equally upon each of the supporting shafts 18. If it is desired that the patient be turned or rolled,

the pawls 29 at each end of the driving shaft are released to engage the ratchets 28 and the thumb screw clutch 34 is loosened. The operating handle 30 is placed on the driving shaft adjacent the winding shaft 18 which is desired to be operated, and the handle accordingly turned. This operation will wind the bands 35 upon one of the shafts 18, while the other shaft remains stationary, and consequently will roll the patient in such manner as to turn the patient over in the manner desired.

The device either with or without wheels, it will be noted, is so constructed as to be placed over the patient each time it is desired to use the mechanism, or after having been once placed in position, it may be left there until use is not required, for the reason that by removing the lifting shafts 18, merely the end arches A and B extend above the cot and these end arches do not in any manner interfere with the movements of the patient or with the persons administering to the patient.

The present invention relates more particularly to the general construction of my device wherein I secure a rigid frame adapted either to be used with or without wheeled casters. While it is illustrated as being foldable, it is not in a strict sense a so called "knockdown" device such as is illustrated in my Patent #936,107, granted October 5, 1909, or as is illustrated in my companion application. My improved operating gearing mechanism is more specifically shown and claimed in my said companion application.

Having thus described my invention what I desire to claim is:—

In a device of the character described in combination, a horizontal frame, supporting devices carried by said horizontal frame, lifting mechanism upon said supporting means, and means to support said horizontal frame at the proper height to enable said frame to be pushed around a bed, said means comprising detachable castered supports which when removed leave said frame adapted for use directly on a suitable mattress.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."