

Aug. 18, 1936.

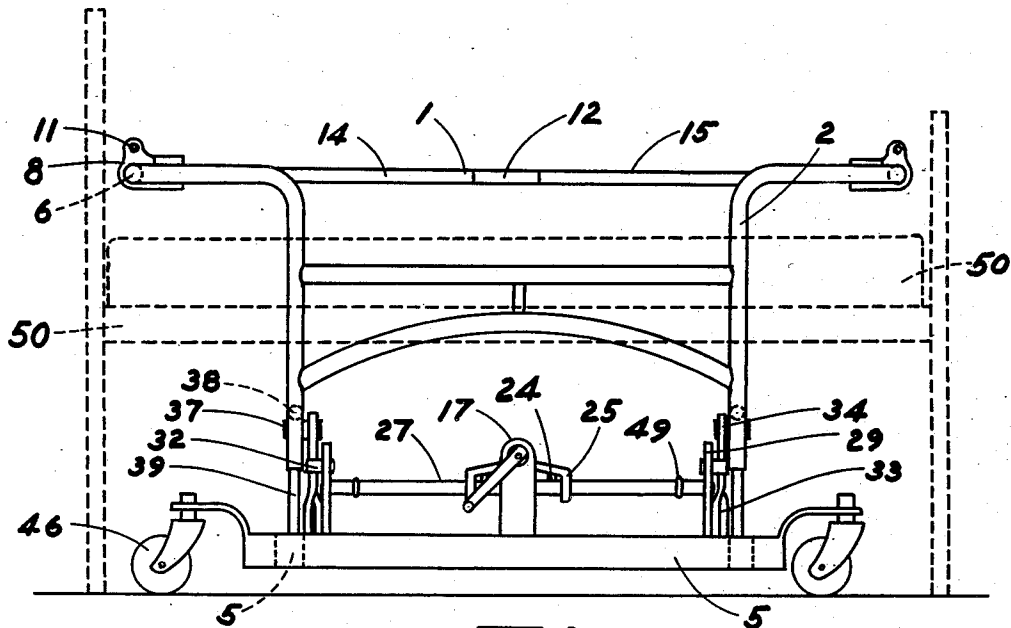
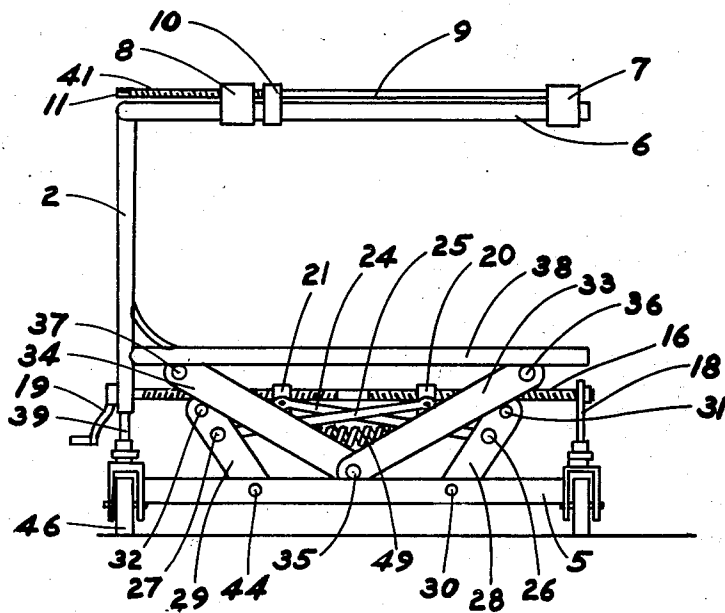
J. PARMLEY

2,051,530

INVALID CRANE

Filed Jan. 13, 1936

2 Sheets-Sheet 1



JOHN PARMLEY.
INVENTOR

BY *W.H. Young*
ATTORNEY

Aug. 18, 1936.

J. PARMLEY

2,051,530

INVALID CRANE

Filed Jan. 13, 1936

2 Sheets-Sheet 2

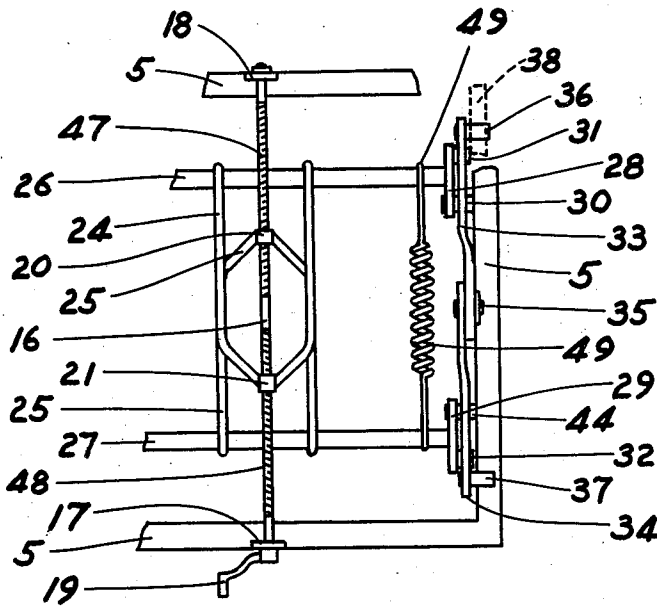


Fig. 3.

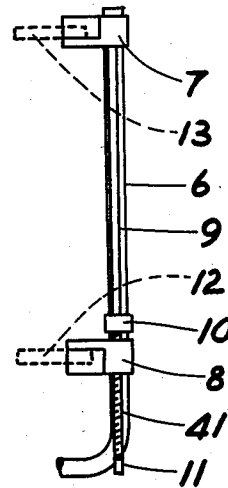


Fig. 4.

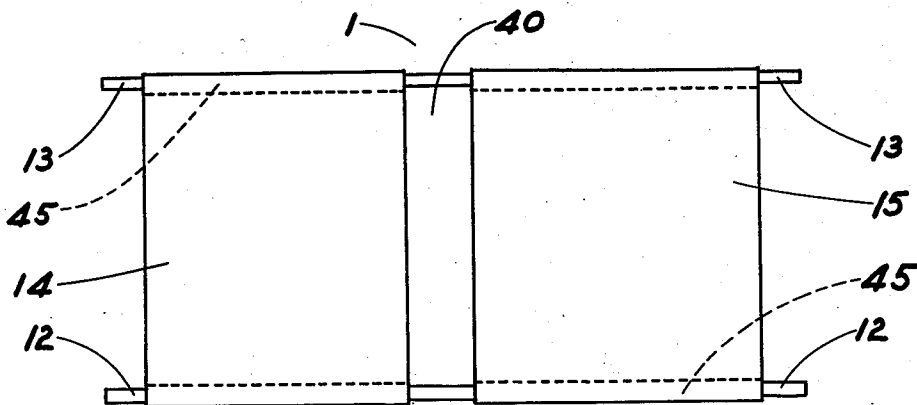


Fig. 5

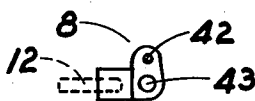


Fig. 6.

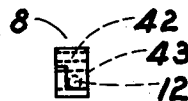


Fig. 7.

JOHN PARMLEY.
INVENTOR

BY

W. H. Young.
ATTORNEY

UNITED STATES PATENT OFFICE

2,051,530

INVALID CRANE

John Parmley, Clifton, N. J.

Application January 13, 1936, Serial No. 58,822

2 Claims. (Cl. 5—86)

This application relates to devices for handling bedridden invalids. The main object of the structure disclosed is to provide improved means for raising or lowering invalids off or onto a bed, in combination with means for transferring or transporting invalids from one bed or sick room to another. The device includes a stretcher of novel design whereby the bed and stretcher sheets may be readily replaced, or routine nursing duties, such as the use of bed pans, performed with the least disturbance to the patient. At the same time most of these duties which normally require a nurse and assistant to perform, may be easily executed by the nurse alone when employing the proposed crane.

Features of the elevating mechanism provide an approximately uniform rate of travel in raising or lowering the patient at all elevations of the stretcher. The improved elevating device together with means for adjusting the tension on the stretcher sheet assures a proper body support and smooth operation thereby allaying the invalid's sensation of bodily movement.

Further objects and advantages of the device will be pointed out in the specifications and appended claims, reference being had to the accompanying drawings illustrating the invention, and in which:

Fig. 1 is a front elevation of the crane, a bed being shown in broken lines.

Fig. 2 is a side elevation of the crane.

Fig. 3 is a plan view showing a portion of the elevating mechanism.

Fig. 4 is a plan view of the right hand mechanism for adjusting the tension on the stretcher sheet.

Fig. 5 is a plan of the stretcher employing a sectional stretcher sheet.

Fig. 6 is a front elevation and Fig. 7 a side elevation of the adjustable stretcher pole brackets.

The general design of the complete device is illustrated in Figs. 1 and 2 wherein numeral 1 represents the invalid stretcher held by the frame structure 2. The frame 2 is supported by the elevating mechanism (Fig. 3) which is mounted on the carriage base 5. The location of a bed and mattress 50 in relation to the crane is illustrated in broken lines in Fig. 1.

The frame 2 comprises the horizontal members 6 and 38, the former adapted to hold the stretcher 1 (Fig. 4) and the latter resting on the elevating device (Fig. 3). The crane is designed so that the horizontal arms 6 are above the bed

and mattress 50, and the horizontal arms 38 adapted to be rolled under the said bed between the head and foot pieces (Fig. 1). The crane frame 2 is adjustably held in a vertical position on the rods 39 which are fixed to the base 5; the vertical members of the frame 2 are adapted to slide over the rods 39 thereby forming a telescopic support as illustrated in Figs. 1 and 2.

The raising mechanism includes the compound levers 33 and 34, and 28 and 29 respectively. The longer levers 33 and 34 are pivoted to the base 5 at a common point 35 and are provided with rollers 36 and 37 adapted to roll along the bottom of the horizontal frame members 38. The short lever arms 28 and 29 are pivoted to the base 5 at points 30 and 44 respectively and are provided with rollers 31 and 32 which roll along the lower side of the levers 33 and 34 respectively. Figs. 3 and 4 illustrate in detail the right hand portions of the raising mechanism and the mechanism for adjusting the stretcher sheet tension, respectively; the left hand portion of the mechanism is of a similar design and principle.

In order to raise the stretcher all that is necessary is to turn the one crank 19 which rotates the shaft 18 in its bearings 17 and 18. By means of the right and left threads 47 and 48 of shaft 16, nuts 20 and 21 are moved either together or apart according to the direction of the rotation of the crank 19. This movement is communicated through the linkage 24 and 25, to the rods 26 and 27 which in turn are connected to the short levers 28 and 29. Counterbalance springs 49 connect rods 26 and 27; the purpose of these springs is to balance the forces set up in the mechanism due to the weight of the patient's body, thereby equalizing the power required to raise and lower the stretcher. When the nuts 20 and 21 are moved apart the levers 28 and 29 are pulled toward each other about their pivots 44 and 30; this in turn forces the levers 33 and 34 toward each other about their pivot 35, thereby raising the frame arm 38 on the rollers 36 and 37. By reversing the direction of rotation of the crank 19 the frame and stretcher may be lowered. Through the coordination of the raising mechanism at each side of the frame 2, the stretcher poles 12 and 13 will be maintained in a horizontal position at all elevations when raised by means of the single crank 19 and the linkage illustrated.

In Fig. 1 the elevating frame 2 is shown supporting the stretcher 1 above the bed 50. A standard stretcher comprising a sheet of canvas

with tubular sides suspended on wooden poles inserted through said tubular sides, may be supported by the frame illustrated but what I prefer to use and claim as part of my invention is a stretcher employing a sectional sheet whereby the full advantages of the crane may be realized. The preferred stretcher 1 is made up of a stretcher sheet in two sections 14 and 15 with the poles 12 and 13 (Fig. 5) removably inserted through the tubular sides 45 of the said sections 14 and 15. One of the purposes of making the stretcher sheet in two sections is to provide an open area 40 to facilitate the performance of routine nursing duties such as the use of a bed pan; this can be accomplished by raising the patient clear of the bed by means of the crane.

A further object of the two section stretcher sheet is to facilitate removing the said sheets from under the patient or for replacing a soiled one. The usual method of changing a bed sheet requires the nurse to roll the patient first to one side of the bed and then to the other. By employing the proposed device with the two section stretcher sheet, the patient is first raised by the crane and the fresh stretcher sheet sections 14 and 15 placed on the bed in their normal position. The patient is then lowered to the bed and each section of the soiled sheet is pulled lengthwise from under the patient's body. As is apparent, only approximately half of the body weight is on each section of the sheet which makes the above method of replacing the stretcher sheet sections practical. The regular bed sheet in such case is immediately below the stretcher sheet and may be readily removed after raising the patient with the crane.

Fig. 4 illustrates the mechanism for adjusting the tension on the stretcher sheet. The poles 12 and 13 upon which the sheet sections 14 and 15 are mounted (Fig. 5), are removably held at the ends by the adjustable bracket 8 and the fixed bracket 7, respectively. The bracket 7 is fixed to the arm 6 which carries the body load on the stretcher pole 13; bracket 7 also forms the rear bearing for shaft 9, the front bearing being indicated by numeral 10. The pole 12 rests in bracket 8 (Figs. 6 and 7) which is adjustably supported by arm 6 and shaft 9; the arm 6 forms a sliding support in hole 43 of bracket 8 and the threaded portion 41 of shaft 9 is adapted to fit the internal threads of hole 42 (Figs. 6 and 7). By rotating the shaft 9 the bracket 8 may be moved along the arm 6 in either direction until the desired stretcher sheet tension is obtained.

The stretcher sheet tension device comprises two similar but independent mechanisms (Fig. 4 illustrates the right hand portion) located, one at each side of the frame 2, and attached to arm (Fig. 1). Each mechanism is independently operated and controls the distance between the ends of the poles 12 and 13, adjacent thereto; this feature permits a greater tension on the

stretcher sheet at one end than at the other, with a uniform graduation in the degree of tension on the sheet between these points. The objects of such a design are first, to provide for a slight variation in elevation between the head and foot by allowing the sheet at one end to sag under slight tension and second, to permit a firm support for the torso and a loose support for the lower limbs, or vice versa.

I claim:

1. A device of the type described comprising a carriage base and a hoist frame supported thereon for vertically sliding movement, two pairs of horizontal hoist frame members, the lower pair adapted to be normally positioned below a hospital bed between the head and base for raising the frame, the upper pair adapted to be normally positioned above the mattress of a hospital bed for supporting an invalid stretcher; moreover, a raising mechanism mounted on said base and including a transverse shaft mounted in bearings on said base, right and left threaded portions of said shaft, a crank attached to the end of said shaft, right and left nuts mounted on the right and left threaded portions respectively of said shaft, one short and one long pair of lever arms at each end of the base and pivoted thereto, rods connecting the short lever arms at one end of the base with the short lever arms at the opposite end for operating said levers simultaneously, a linkage connecting said nuts and said rods, said pair of long lever arms at each end of the base being pivoted thereto at a common point, rollers at the other end of said longer levers adapted to roll along the lower side of said lower horizontal members of the hoist frame for raising the frame, rollers at the upper end of said shorter levers adapted to roll along the lower side of said longer levers for raising the longer levers, and springs connecting said rods for counter balancing and equalizing the power required to raise and lower the frame.

2. A hoist for standard invalid stretchers comprising a stretcher sheet suspended on poles, including a hoist frame, two horizontal hoist frame arms in combination with two stretcher sheet tension mechanisms, one mounted on each of said arms, and including a stretcher pole supporting bracket fixed to the rear of said arm, a stretcher pole bracket adjustably supported on the forward portion of said arm, a bearing attached to said arm, a shaft supported forwardly by said bearing and journaled at the rear in the fixed bracket, a threaded hole in said movable bracket, a threaded forward portion of said shaft meshing with the threaded hole in the movable bracket, whereby the bracket may be adjusted in position along the said horizontal arm by rotating the shaft, both brackets being designed to removably support the ends of standard stretcher poles substantially as described.

JOHN FARMLEY.