May 27, 1952 R. K. LEWIS 2,598,570

HOIST FOR TRANSPORTING INVALIDS

Filed June 5, 1950 2 SHEETS—SHEET 1

Fig. 1

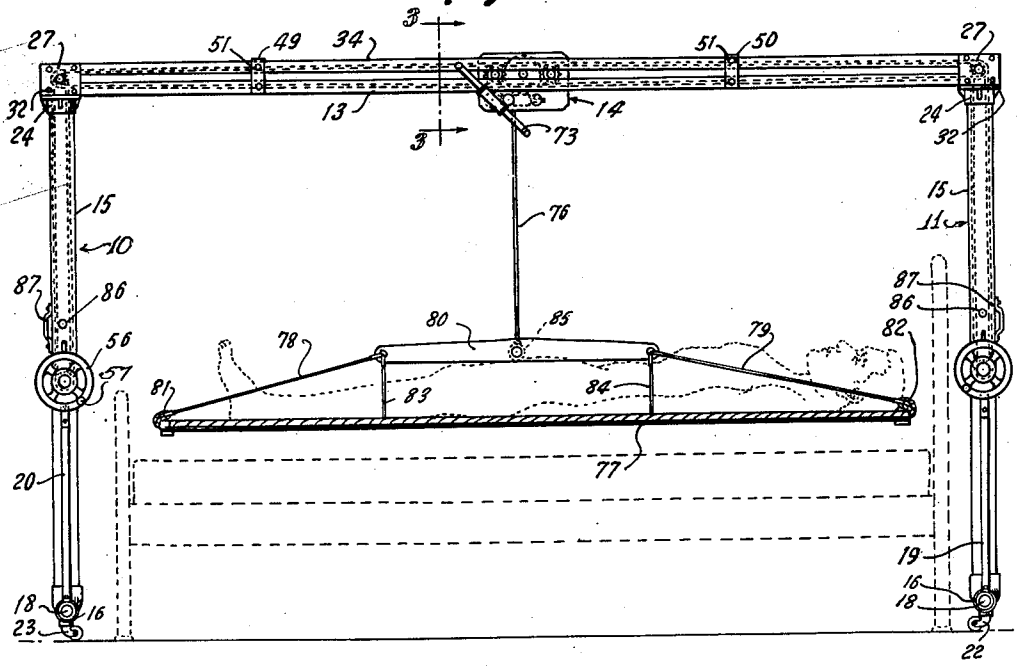


Fig. 2

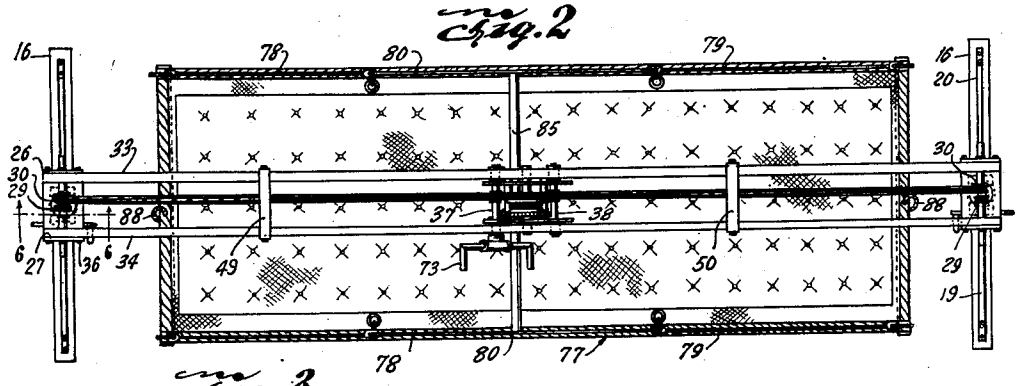
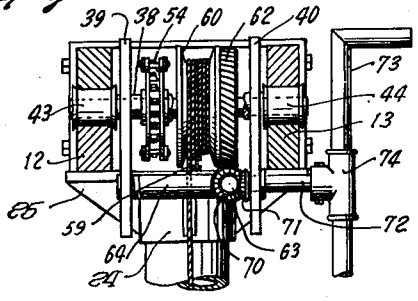


Fig. 3



ROY K. LEWIS
INVENTOR.

BY

ATTORNEY

May 27, 1952 R. K. LEWIS 2,598,570

HOIST FOR TRANSPORTING INVALIDS

Filed June 5, 1950 2 SHEETS—SHEET 2

Fig. 5

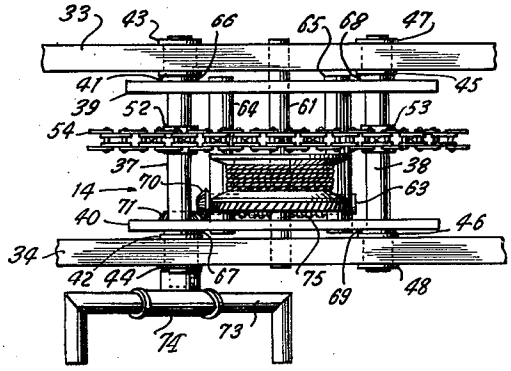


Fig. 4

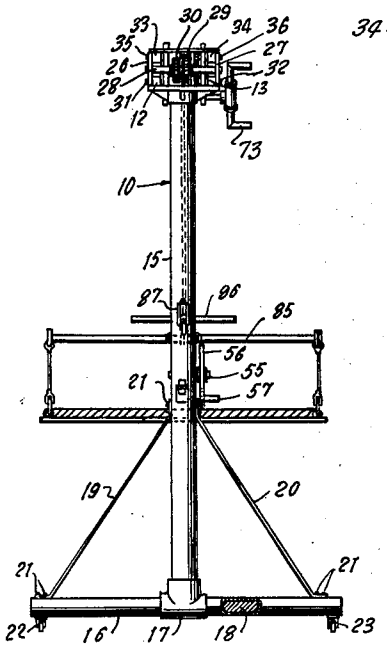
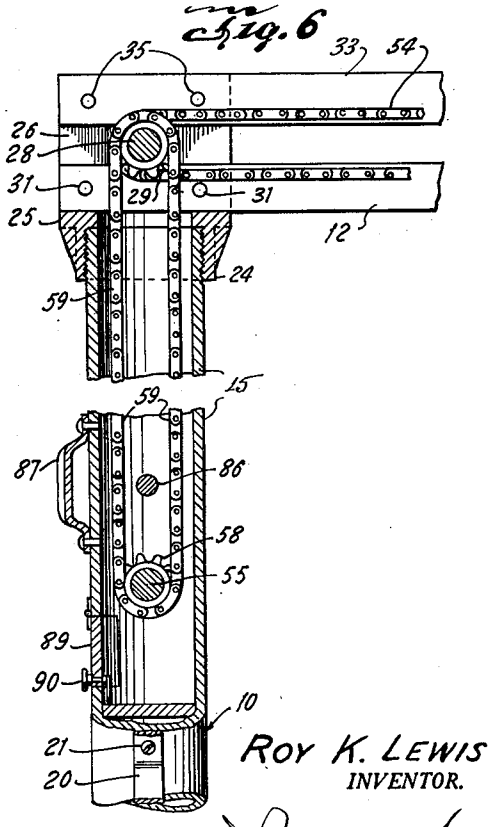


Fig. 6



ROY K. LEWIS
INVENTOR.

BY

ATTORNEY

Patented May 27, 1952 2,598,570

UNITED STATES PATENT OFFICE

2,598,570

HOIST FOR TRANSPORTING INVALIDS

Roy K. Lewis, Dallas, Tex.

Application June 5, 1950, Serial No. 166,272

2 Claims. (Cl. 212—14)

1

This invention relates to hoists for transporting invalids from one place to another and more particularly to such hoists by means of which the invalid may be lifted from a bed and moved to another location while the invalid remains immobile.

Very often gravely injured persons or invalids must be maintained almost absolutely immobile since movement of any member of the injured person's body may result in aggravation of the already existing injuries or the infliction of new injuries. At times, however, the invalids must be moved from one location to another, e. g., from a hospital room to the operating or X-ray room. Devices employed to lift the invalid from his bed and transport him from one location to another must be easily handled, must not have numerous components which might come in contact with the patient's body, and must enable the body of the invalid to be kept immobile as he is lifted from the bed and thereafter transported.

Accordingly, it is an object of my invention to provide a new and improved hoist for transporting invalids.

It is another object of my invention to provide a new and improved hoist for transporting an invalid while maintaining his body immobile.

It is still another object of my invention to provide a new and improved invalid transporting device of simple construction which is easily operable to move the patient while the patient remains in an immobile position.

Briefly stated my new and improved hoist comprises a pair of wheeled standards which support a pair of rails along which travels a carriage. A sprocket and chain drive is connected to the carriage for moving it along the rails between the standards. The carriage is provided with a worm gear driven reel to which is attached one end of a rope or other flexible member. The other end of the rop is secured to platform to raise or lower the platform as the reel is rotated.

For a better understanding of my invention reference may be had to the following description taken in connection with the accompanying drawing and its scope will be pointed out in the appended claims.

In the drawing:

Figure 1 is a side view of my new and improved hoist for transporting invalids;

Figure 2 is a top plan view of the device shown in Figure 1;

Figure 3 is a sectional view taken along line 3—3 of Figure 1, with a shaft partly broken away to show clearly the reel assembly;

2

Figure 4 is an end view of the device shown in Figure 1 partly broken away;

Figure 5 is a top plan view of the carriage and its associated structure; and

Figure 6 is a vertical sectional view taken along line 6—6 of Figure 2.

Referring now to the drawing, a pair of standards 10 and 11 support a pair of rails 12 and 13 along which travels a carriage 14. Each of the standards 10 and 11 comprises a vertical tubular member 15 having its lower end rigidly secured to a bottom cross member 16 by any suitable means such as the T-coupling 17. The cross members 16 are weighted, as by filling with the lead 18, in order to make the standards more stable. A pair of reinforcing members 19 and 20 connect the extremities of each cross member 16 to tubular member 15 and are secured to members 15 and 16 by means of screws 21. The cross members 16 are also provided with casters 22 and 23 rotatably mounted on cross members 16, in any conventional manner, in order that the standards 15 may be easily rolled from one place to another.

The upper end of each tubular member 15 is exteriorly threaded to engage the interior threads of a bracket 24 which is provided with an outwardly extending flange 25. Rigidly secured, by welding or other conventional means, to flange 25 are spaced side plates 26 and 27. Side plates 26 and 27 could be integral with bracket 24 if it were so desired. A shaft 28 to which are rigidly attached a pair of sprockets 29 and 30 has its ends journaled in appropriate registering apertures provided in the side plates 26 and 27.

The support rails 12 and 13 rest upon flange 25 and are secured to the side plates 26 and 27, respectively, of standards 10 and 11 by means of bolts 31 and 32 respectively. A pair of guide rails 33 and 34 are also secured to the side plates 26 and 27, respectively, of standards 10 and 11 by means of bolts 35 and 36, respectively. The guide rails 33 and 34 are spaced from and extend above and parallel to support rails 12 and 13, respectively. Support rails 12 and 13 support the rotatable shafts 37 and 38 journaled in the frame members 39 and 40 of carriage 14 while guide rails 33 and 34 prevent the shafts 37 and 38 from being displaced from, or jumping, support rails 12 and 13. Shaft 37 is provided with inner flanges 41 and 42 and outer flanges 43 and 44 while shaft 38 is provided with inner flanges 45 and 46 and outer flanges 47 and 48. These flanges 41 to 48 are provided to maintain carriage 14 properly centered between the rails. Substantially U-

shaped brackets 49 and 50 extend over and along the outer sides of rails 12, 13, 33 and 34 and are secured to these rails by means of bolts 51 or any other suitable means. Brackets 49 and 50 maintain the rails in proper alignment.

In order to provide a means for moving carriage 14 between standards 10 and 11 along rails 12 and 13, shafts 37 and 38 have been provided with sprockets 52 and 53, respectively, which are rigidly secured to shafts 37 and 38. An endless chain 54 engages sprockets 52 and 53 and passes around each sprocket 30 in the shafts 28 of standards 10 and 11. Each standard 10 and 11 is provided intermediate its ends with a shaft 55 which is rotatably journaled in the tubular member 15 and which has rigidly attached at one end a wheel 56 provided with a handle 57. Disposed within each tubular member 15 and rigidly secured to the shaft 55 is a sprocket 58. An endless chain 59 extends between sprockets 58 and 29 so that when wheel 56 is rotated, chain 59 rotates sprocket 29 and shaft 28. This in turn causes sprocket 29 to be rotated moving the endless chain 54 either in clockwise or counterclockwise direction, Figure 6. Since chain 54 engages sprockets 52 and 53 of shafts 37 and 38, shafts 37 and 38 are rotated and carriage 14 is moved either toward standard 10 or standard 11. It will be noted that since both standards 10 and 11 have been provided with wheels 56 and their associated structures, the position of carriage 14 on rails 12 and 13 can be controlled from either standard 10 or 11.

A reel 60 is mounted between frame members 39 and 40 by means of a shaft 61 rotatably journaled in frame member 39 and 40. Reel 60 and a gear 62 are rigidly secured to shaft 61. A shaft 63 is rotatably journaled in a pair of cross members 64 and 65 which are rigidly secured to frame members 39 and 40. Cross members 64 and 65 may have their ends exteriorly threaded to engage interiorly threaded registering apertures in frame members 39 and 40. Besides acting as mounting means for shaft 63, cross members 64 and 65 maintain frame members 39 and 40 in properly spaced relationship. Spacers 66 and 67 and 68 and 69 may be loosely mounted on shafts 37 and 38, respectively, between frame members 39 and 40 and the inner flanges to maintain carriage 14 properly positioned between the rails.

Rigidly secured to one end of shaft 63 is a bevel gear 70 which meshes with a bevel gear 71 rigidly secured to one end of a shaft 72 rotatably journaled in frame member 40. Handle 73 is secured to the other end of shaft 72 by any suitable means such as a T-coupling 74. Also rigidly secured on shaft 63 is a worm gear 75 which meshes with gear 62 to rotate gear 62 and shaft 61 when handle 74 is turned. Since reel 60 is rigidly secured to shaft 61, it also rotates when handle 74 is turned to wind or unwind a flexible member 76 such as a rope or cable, one of whose ends is secured to reel 60. A worm gear 75 is used to obviate the use of a locking means for reel 60 which would otherwise be needed to prevent unwinding of flexible member 76 if a weight were attached to the end of flexible member 76 not secured to reel 60.

A flat platform 77 suitably covered with a fabric and having all sharp edges and corners padded is provided on each side with lifting members 78 and 79 which are connected to one of two parallel side bars 80 and to flexible loops 81 and 82 respectively secured adjacent each side of platform 77 to the ends of platform 77. A pair of supporting members 83 and 84 are also provided at each side of platform 77 and are connected to platform 77 intermediate its ends and also to one side bar 80. The side bars 80 at the sides of platform 77 are connected by a cross bar 85 to the center of which is connected the end of flexible member 76 which is not connected to reel 60. Lifting members 78 and 79 and supporting members 83 and 84 are preferably detachably connected to platform 77 by snaps or other conventional detachable means, not shown, in detail, in order that the patient or invalid can be initially placed on platform 77 without any hindrance. Platform 77 itself being very flat can be inserted beneath an invalid and the bed with a minimum movement of the invalid's body. If the invalid is very seriously injured so that the last movement of his body might be deleterious, the invalid, once placed on platform 77, will not be moved until his condition improves to the point where complete immobilization is no longer necessary.

In moving the invalid from one place to the other, the standards 10 and 11 are wheeled to a position in which the rails 12 and 13 extend over the bed from its foot to its head. The lifting members 78 and 79 and the supporting members 83 and 84 are attached to the platform 77 which is on the bed underneath the invalid. Only the cross bar 85 will then extend over the invalid's body in proximity to his body so that there is little likelihood that some part of the hoisting apparatus will contact any portion of the invalid's body. The carriage 14 is then moved by means of one of the wheels 56 until it is in such a position over the bed that flexible member 76 will exert an upward force directly over the center of gravity of the loaded platform 77 when handle 73 is turned to lift platform 77 and the invalid off the bed. Since usually a number of persons, nurses, doctors and orderlies, are present whenever a gravely ill or seriously injured person is moved, the platform will be steadied by one of these attendants during the movement of the platform. Handle 73 is then turned until platform 77 clears the bed. The whole apparatus is then pushed or pulled by means of the bars 86 and handles 87 secured to each tubular member 15 to move the patient to another location where the platform 77 and the invalid will be lowered to another bed, an operating or X-ray table, or to any other desired resting place. The platform 77 is also provided at each end with loops 88 to provide a means for fastening platform 77 to standards 10 and 11 to help steady the platform.

Each tubular member 15 is also provided with a hinged door 89 provided with a latch 90 to provide access to sprocket 58 and chain 59 for maintenance purposes.

It will be readily apparent that the hoisting apparatus of my invention is very simple in construction having only one flexible member 76 by means of which the platform 77 is raised. As a result, the invalid is not exposed to the danger of having any one of a number of ropes or cables fouling and coming in contact with his body. The simplicity of construction also leads to simplicity of operation so that even personnel not trained in the operation of hoisting apparatus can at first glance operate the hoist satisfactorily.

While I have shown a particular preferred embodiment of my invention, it will be obvious to those skilled in the art that various changes and modifications can be made without departing

from my invention and I, therefore, aim in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of my invention.

What is claimed is:

1. In a hoisting and transporting apparatus, a pair of freely movable vertical upright members; a sprocket journaled in the upper end of each of said upright members; carriage supporting means extending horizontally between said upright members; a sprocket chain operating on said sprockets whose leads are parallel with said carriage supporting means; a carriage movably mounted on said carriage supporting means for horizontal movement along said supporting means; a hoist reel shaft journaled in said carriage; a reel on said reel shaft; a sprocket wheel on said shaft between the leads of said chain and in engagement therewith; a worm gear on said reel shaft; a second shaft journaled in said carriage below said reel shaft; a worm on said second shaft engaging said worm gear for rotating said worm gear to impart rotation to said hoist reel shaft to actuate said reel and to move said carriage along said supporting means.

2. In a hoisting and transporting apparatus, a pair of freely movable vertical upright members; a sprocket wheel in the upper end of each of said upright members; carriage supporting means extending horizontally between said upright members; a carriage movably mounted on said carriage supporting means for horizontal movement along said supporting means; a hoist reel shaft journaled transversely in said carriage; a hoist reel mounted on said reel shaft; a sprocket wheel affixed to said reel shaft; a sprocket chain operable on the sprocket wheels in said upright members and whose upper and lower leads engage the teeth of the sprocket wheel on said reel shaft; a flexible member having one end secured to said reel; a worm gear affixed to said reel and mounted on said reel shaft; an operating shaft in said carriage; a worm operated by said last named shaft and engaging said worm gear, and a handle for rotating said operating shaft to rotate said reel shaft.

ROY K. LEWIS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
9,215	Hopkins	Aug. 24, 1852
302,727	Hardeman et al.	July 29, 1884
560,145	McGehee	May 12, 1896
1,051,728	German	Jan. 24, 1913
1,536,766	Cammann	May 5, 1925