

Aug. 2, 1938.

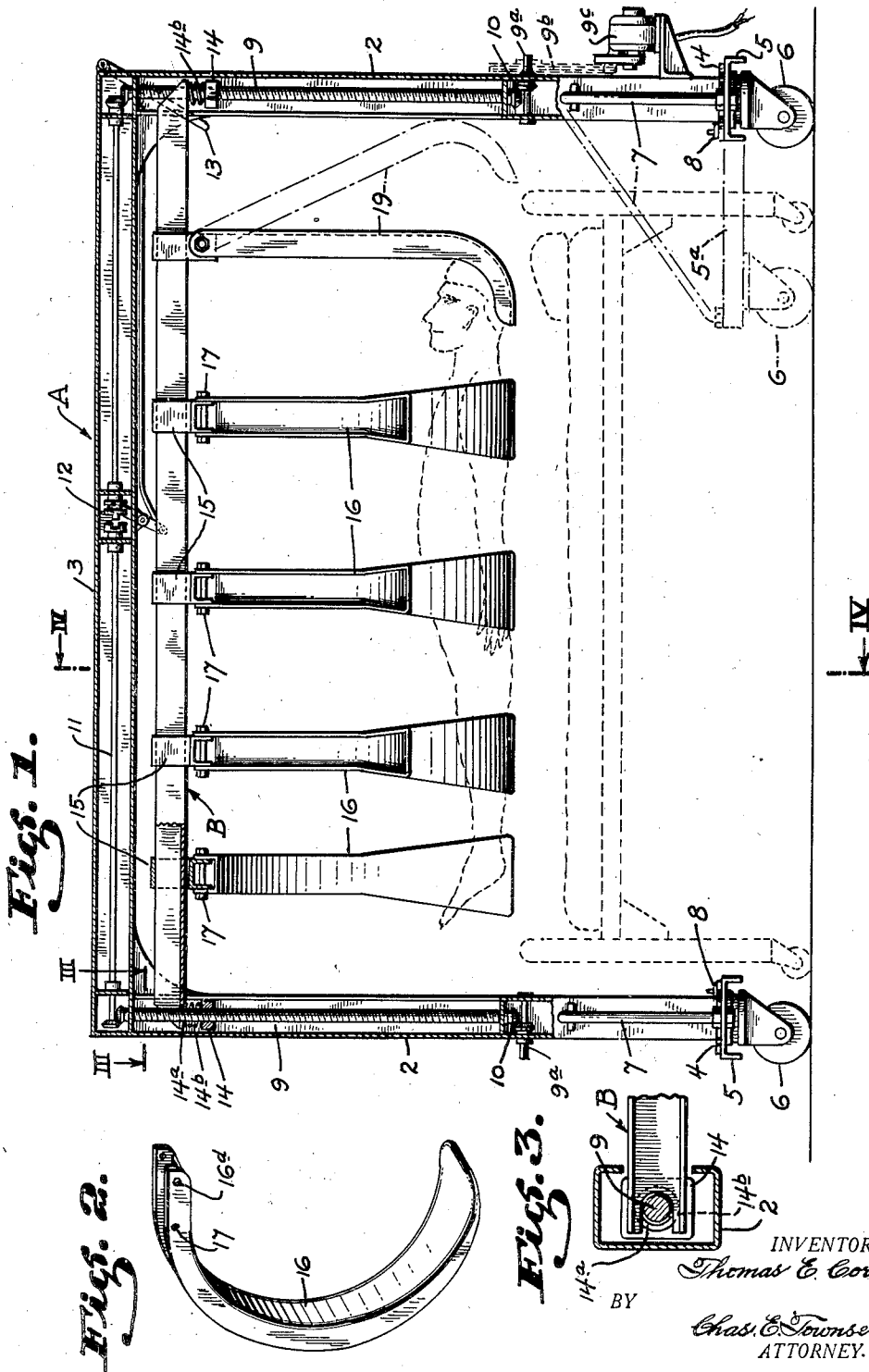
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2,125,546

PORTABLE LIFTING DEVICE

Filed Feb. 17, 1937

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Fig. 5.

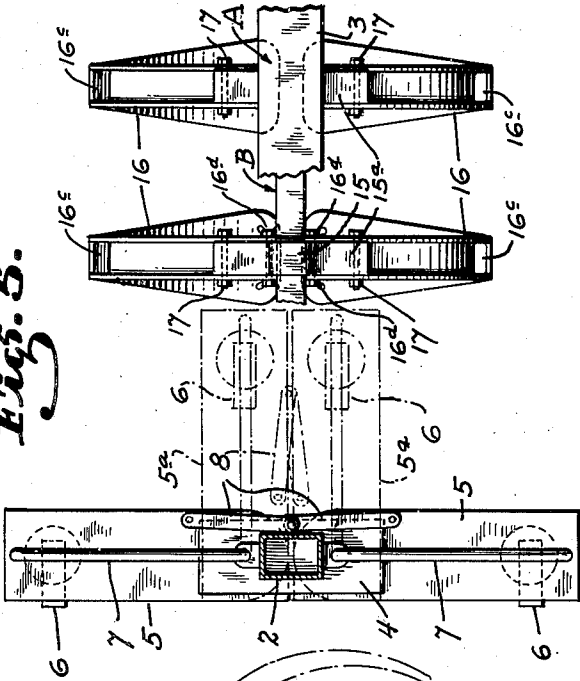


Fig. 4.

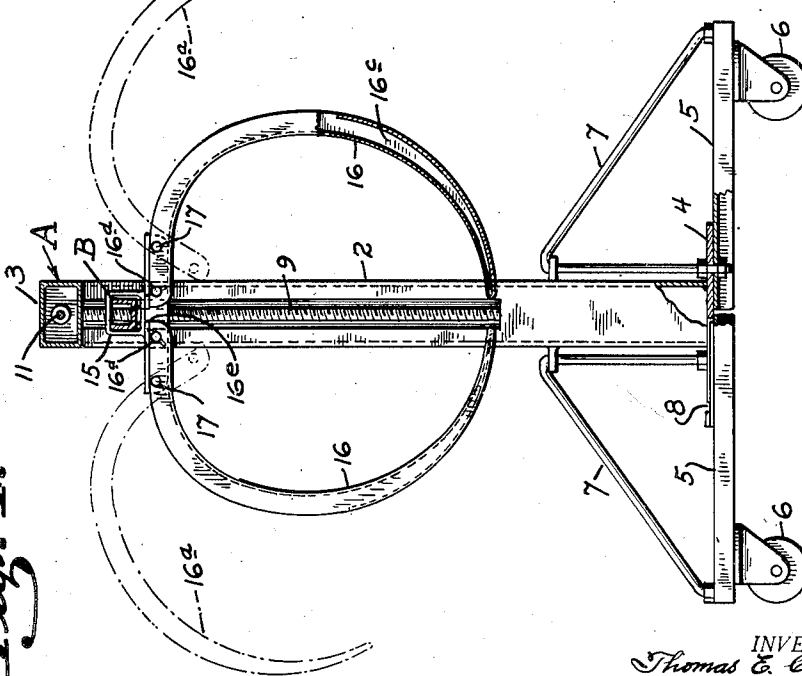
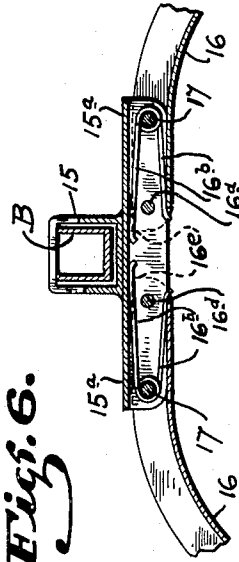


Fig. 6.



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PORTABLE LIFTING DEVICE

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3 Claims. (Cl. 5-38)

This invention relates to an apparatus for lifting and moving cripples, invalids, sick persons and the like, and consists of a wheel or caster-supported frame adapted to straddle or span a bed and which is provided with means for supporting and lifting a patient from a bed, and of being freely movable on a floor to transfer a patient to an operating room or other place and for again returning the patient to his or her room and bed, the operation of raising or lowering a person being accomplished without shock, vibration, or discomfort to the patient. This application is a continuation in part of my former application entitled "Portable lifting device", filed March 31, 1936, Serial No. 71,866.

The object of the present invention is to generally improve and simplify the construction and operation of lifting devices comprising a wheel- or caster-supported frame having a lifting beam mounted and guided therein; to provide means suspended from the beam for engaging and supporting the patient to be lifted; to provide manual or power actuated means for raising either end of the beam or both ends in unison; and further, to provide a lifting device of the character described which may be readily passed through doorways or similar narrow passages.

The invention is shown by way of illustration in the accompanying drawings in which—

Fig. 1 is a side elevation in section of the lifting device;

Fig. 2 is a perspective view of one of the supporting arms;

Fig. 3 is a cross section taken on line III—III, Fig. 1;

Fig. 4 is a cross section of the lifting frame taken on line IV—IV, Fig. 1;

Fig. 5 is a plan view of one end of the lifting frame, said view being partially broken away and being partially in section; and

Fig. 6 is an enlarged cross section of the lifting beam and one of the hangers from which the supporting arms are suspended.

Referring to the drawings in detail, and particularly Figs. 1 and 4, A indicates in general an elongated frame consisting of a pair of posts or uprights 2—2, connected at their upper ends by a horizontally disposed bar 3. Each post terminates in a base plate 4 which is supported by horizontally extending leg members 5 which, in turn, are supported by casters 6. The inner ends of the legs 5 are pivoted to the base plate and they are, furthermore, braced with relation to the posts as shown at 7 to stand any load applied.

The frame as a whole, as will be noted by reference to Fig. 1, is sufficiently long to permit it to straddle a bed lengthwise. In this position of the frame and also when shoving or moving it from room to room, the legs 5 will assume the

position shown in Figs. 4 and 5; that is, a position at right angles to the bar 3 or the longitudinal axis of the frame so as to give the greatest lateral stability possible, but when the frame is to be passed through a doorway, or similar narrow passage, the legs will assume a trailing position, such as indicated by dotted lines 5a in Fig. 5. After one end of the frame has passed through the door the legs will again be swung outwardly as shown in full lines in Fig. 5, and will there be locked by toggle links 8. When the rear end of the frame is to be passed through the legs will again be swung inwardly and when they have passed through they will be swung outwardly and locked. Even with one pair of legs, or another, swung inwardly parallel to the longitudinal axis sufficient lateral stability is insured as a three-point support is provided but the greatest stability is, of course, maintained when all of the legs are extended.

The posts 2—2 and the bar 3 are preferably constructed of channel bars, or the like. Each post 2 carries a screw shaft 9 and a right angularly extending shaft 9a, such shaft being squared on its outer end to receive a hand crank, or the like, whereby it may be rotated. Bevel gears 10 connect the shafts 9 and 9a so that when shaft 9a is rotated rotary motion will also be transmitted to the shaft 9. A shaft 11 extends lengthwise of the bar 3. This is provided with bevel gears at opposite ends and these intermesh with bevel gears on the upper ends of the shaft 9; hence when either of the shafts 9 are rotated shaft 11 will also be rotated. However, there may be times when only half of the length of shaft 11 is to be rotated and to permit such independent rotation a clutch 12 is provided whereby the two halves of the shaft 11 may be connected or disconnected, as will hereinafter appear, said clutch being actuated by a lever 13 disposed at one end of the frame and suitable linkage connections. While shafts 9a are crank rotated, they may be power rotated, for instance by placing a pulley or sprocket at the point 9b and driving it from an electric motor 9c or the like secured to a bracket on the frame.

Mounted on each of the shafts 9 is a nut 14. These nuts are secured against rotation by being square and engaging the inner faces of the channel. The nuts form a support for a lifting beam B which is parallel to the bar 3 and extends from end to end of the frame. That is, the ends of the beam B are slotted as shown at 14a in Fig. 3, so as to straddle the shafts 9 and to rest upon the nuts 14. When both of the shafts 9 are rotated in unison as when the clutch 12 is connected, both nuts will rise or fall with uniform speed and the beam B will be lifted horizontally. By disconnecting the clutch 12 and rotating either one or another of the shafts 9, one end 60

or the other of the beam may be raised independently of the other. Again, by connecting the clutch 12, the beam may be raised horizontally from either end of the frame by merely applying a crank to one or another of the shafts 8a. To permit a patient to rest with ease or without being subjected to unnecessary shock or vibration while being transported, springs 16b may be interposed between the nuts 14 and the ends 14a of the beam B.

The beam, as already stated, is a lifting beam and carries a plurality of hangers 15 which are square in cross section to prevent swinging movement about the beam, but they are slidable longitudinally of the beam. Each hanger carries a pair of supporting arms 16 pivoted to the hanger as at 17. The arms normally assume the dotted line position shown at 16a, see Fig. 4, but they may be swung downwardly and inwardly as shown in full lines in Fig. 4.

The shape of the arms is clearly disclosed in Fig. 2. That is, they are channel-shaped at their upper ends to provide strength and they are gradually flattened and rounded at their lower ends so that they may be readily pushed in under or inserted between the patient and the mattress upon which he or she is lying so as to be in a position to support a person when the beam B is lifted. The arms, as already stated, normally assume the dotted line position shown at 16a as springs 16b are interposed between the hanger and each arm to normally maintain them in a sufficiently spread position to clear the patient when they are lowered to pick up the patient. A pocket 16c is formed at the lower end of each arm, and these may be filled with warm water, or a hot water bag or an electric heating pad or the like may be inserted in the pockets to heat or warm the arms prior to use.

In actual practice, if it is desired to remove a patient from his or her bed, the frame is placed in a position straddling the bed lengthwise, as shown in Fig. 1. When the frame is first brought into position, the supporting arms 16 will assume their spread position. Each arm is then inserted in under the patient or between the patient and the mattress, and when inserted are locked one by one by pins 16d which are inserted at the same time through the hangers and the inner upper ends of the arms to lock them and secure them against pivotal movement, thus preventing accidental spreading of the arms while the patient is being lifted and while supported by the arms. In this position, the beam B and hangers supporting the patient are elevated and the frame may be swung clear of the bed and may be shoved or pulled from room to room. By this construction and arrangement of parts, it becomes possible for a single person or attendant to pick up a patient and transport the patient from room to room, as when the frame straddles the bed and the beam and arms are lowered to pick up the patient, the nurse will first stand on one side of the bed and insert one arm after the other under that side of the patient and lock them and can then step around to the other side of the bed and insert the arms on that side and lock them, and then either apply a hand crank or power to one or more of the shafts 8a and elevate the patient with relation to the bed, after which the frame carrying the patient may be readily shoved or pulled wherever desired.

When the patient is to be released, for in-

stance to be placed upon an operating table or another bed, the frame B is lowered until the patient rests on the bed and the arms 16 are then removed one by one. The entire operation of raising and lowering the patient and transferring the patient from place to place is thus simply and readily accomplished and without any exertion on the part of the nurses or attendants, and, furthermore, without shock, vibration or inconvenience to the patient.

The supporting arms 16 are, as previously stated, pivoted at 17, and as springs are interposed between the arms and the hangers, the arms will normally assume a spread position, but their inward movement will be limited as the ends 16e of the arms will engage extensions 16a of the hangers and thereby prevent any squeezing or application of pressure to the patient when supported by the arms. In other words, the inward movement of the arms is limited by the extensions 16a and 16e. The arms are arranged in pairs wherever the body is to be supported, but a single arm will suffice for the head, and this arm is indicated at 19.

While this and other features of the present invention have been more or less specifically described and illustrated, I wish it understood that various changes may be resorted to within the scope of the appended claims, and similarly, that the materials and finish of the several parts employed may be such as the manufacturer may decide or varying conditions or uses may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a lifting device of the character described an elongated frame, a lifting beam guided and vertically movable in the frame, a plurality of hangers movable longitudinally of the beam, a pair of arcuate supporting arms independently pivoted to each hanger, a spring interposed between each arm and hanger to normally maintain the arms spread apart, means for limiting the movement of the arms towards each other, and a resilient support for each end of the beam.

2. In a lifting device of the character described an elongated frame, a lifting beam guided and vertically movable in the frame, means for lifting both or either end of the beam to cause it to assume a horizontal or an angular position within the frame, a plurality of hangers on the beam, a pair of arcuate supporting arms independently pivoted to each hanger, a spring interposed between each arm and hanger to normally maintain the arms spread apart and in a raised position, means for limiting the movement of the arms towards each other, and a resilient support for each end of the lifting beam.

3. In a lifting device of the character described, having a main frame and a lifting beam guided and vertically movable therein, a plurality of hangers on the lifting beam, a pair of arcuate supporting arms independently pivoted and movable on each hanger, a spring interposed between each arm and hanger and normally maintaining each arm in a raised position and spread apart, said pivots and springs permitting each arm to be independently swung from a raised to a lowered position, and means for locking each arm against pivoting movement when swung to a lowered position.

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