

(No Model.)

2 Sheets—Sheet 1.

H. G. MONKHOUSE.
INVALID LIFT.

No. 470,944.

Patented Mar. 15, 1892.

Fig. 1.

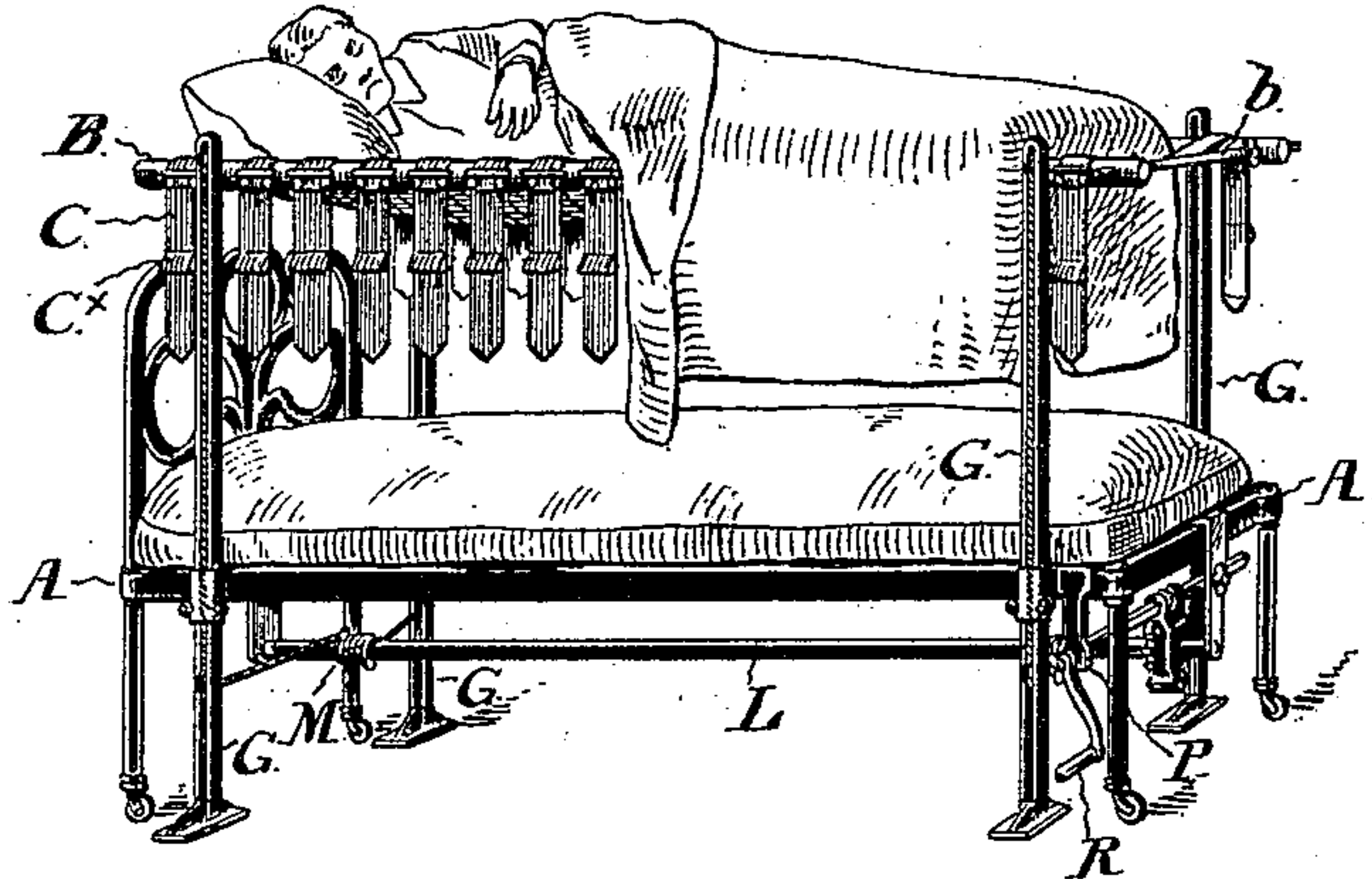
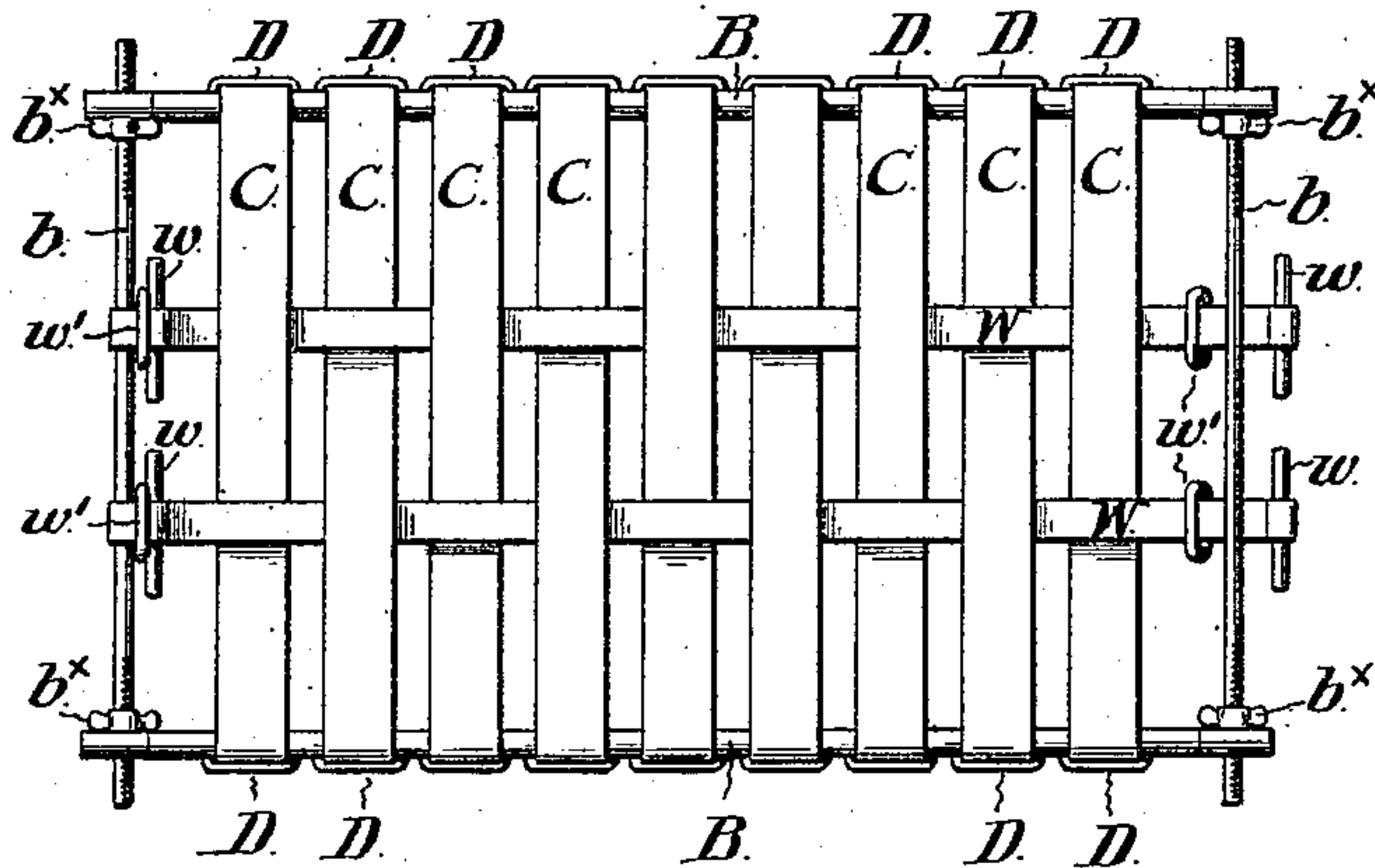


Fig. 5.



WITNESSES:

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Helen Gibson Monkhouse

INVENTOR

By her attorney
J. Norman Dixon

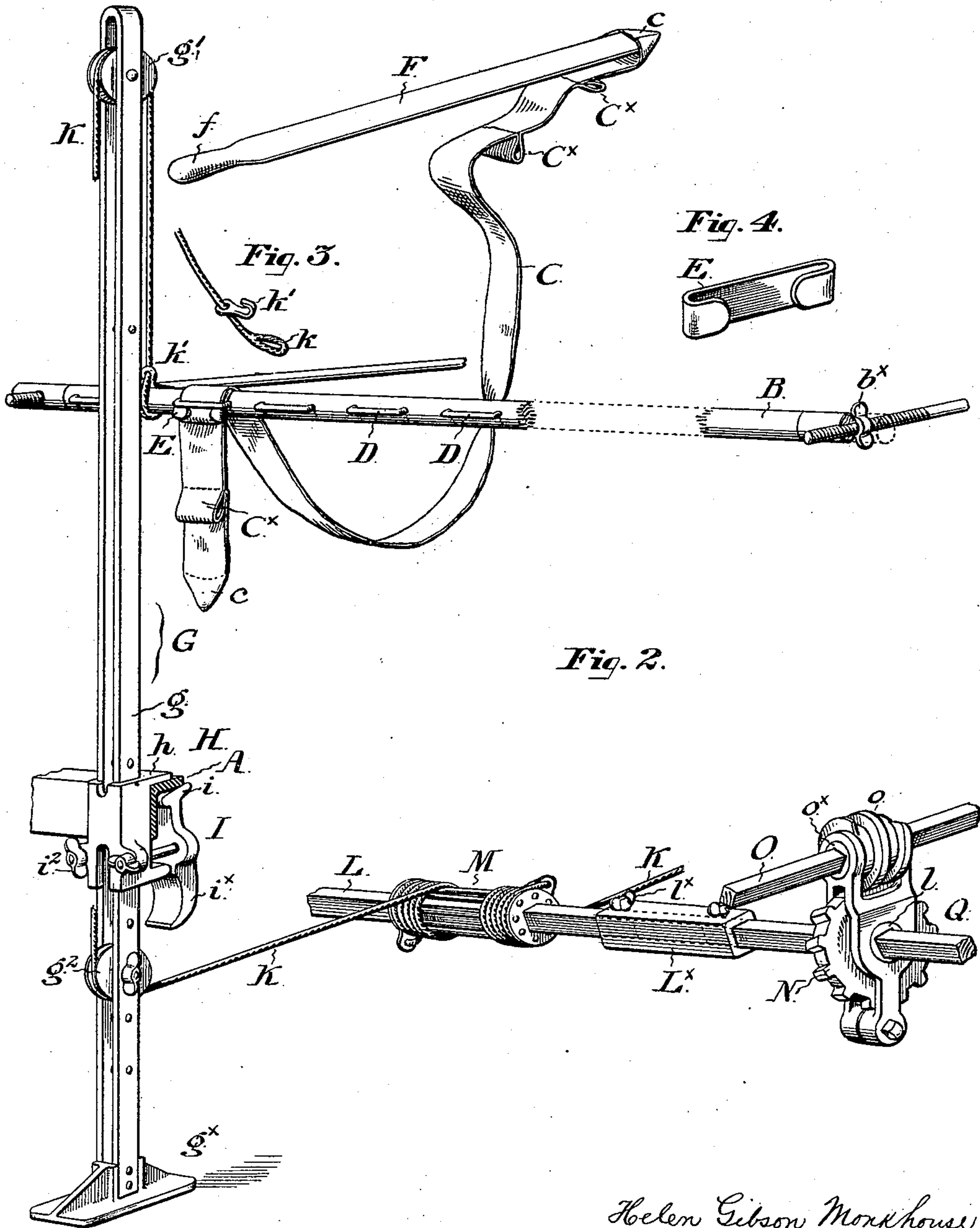
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UNITED STATES PATENT OFFICE.

HELEN GIBSON MONKHOUSE, OF LONDON, ENGLAND.

INVALID-LIFT.

SPECIFICATION forming part of Letters Patent No. 470,944, dated March 15, 1892.

Application filed August 2, 1890. Serial No. 360,771. (No model.) Patented in England May 25, 1888, No. 7,673.

To all whom it may concern:

Be it known that I, HELEN GIBSON MONKHOUSE, a subject of the Queen of Great Britain, residing at 32 Tulse Hill, Brixton, London, S. W., England, have invented an Improved Bed-Lift, (for which I have obtained Letters Patent of Great Britain No. 7,673, dated May 25, 1888,) of which the following is a specification.

10 It is the object of my invention to provide a lifting and moving apparatus for employment in connection with bedsteads occupied by invalids which can be introduced into position with the minimum of disturbance to the patient, which is easy of operation, and by which
15 the patient may be without effort on his or her part gently elevated or moved, thereby facilitating the operations of making up and airing the bedclothes and the performance
20 of the various offices incident to attendance upon invalids.

In the accompanying drawings I illustrate and herein describe a good form of a preferred embodiment of my invention, the particular subject-matter claimed as novel being
25 hereinafter definitely specified.

My invention comprehends the provision of a rectangular frame approximating to the outline of the bed itself, and in connection
30 therewith of a system of sling-straps adapted to be extended across said frame to directly receive the weight of the patient, and of mechanism preferably located as to its principal parts beneath the bed, by the operation
35 of which the frame referred to may be elevated at will.

In the drawings, Figure 1 is a view in perspective of a bed provided with a lift embodying my invention and exhibiting said lift as
40 occupying an elevated position and supporting a patient. Fig. 2 is a view in perspective of principal parts of the devices constituting the improved bed-lift removed from the bed, but shown in their proper relative positions.
45 Fig. 3 is a view of one of the end portions of a lifting-rope. Fig. 4 is a detail view of one of the keys or keepers. Fig. 5 is a top plan view of the lifting-frame, illustrating it as provided with both longitudinal and trans-
50 verse sling-straps.

Similar letters of reference indicate corresponding parts.

In the drawings, A indicates a bedstead, that shown being of iron, although the apparatus is also useful in connection with bed- 55
steads of other construction, and B are the side members, and b the end members, of what I term the "raising-frame." The end members b are shown as screw-threaded and provided with thumb-screws b^x near each end, which 60
ends are all passed through apertures in the respectively-adjacent ends of the members B. These thumb-screws are provided for the purpose of preventing the two side members being unduly drawn together when weight is 65
laid upon the sling-straps, whereof hereinafter, and also for the purpose of adjusting the width of the frame itself.

I provide a series of sling straps or bands to extend from one side of the frame to the 70
other, and these with the method of their introduction I now proceed to describe. These straps, which I designate C, are of any desired, but conveniently of textile, material, and in length somewhat in excess of the great- 75
est width of the frame. Each strap is at one or both extremities provided with a pocket c, and each pocket is conveniently formed by bending toward each other the two corners of the square end of the strap and sewing the 80
meeting edges together. The frame members B are at given intervals along their length provided with staples D, each of about the width of a strap C and all conveniently fixed in the sides of the members B which face 85
away from the center of the bed. Each strap C is, when this method of attachment is resorted to, provided at or near each end with a key or keeper E, formed of a plate of metal, the extremities of which are upset and turned 90
toward each other, and which keys are secured to the straps by being each as to its body portion engaged in a transverse fold C^x, sewed in a strap and constituting a key-seat, of which key-seats each band possesses two, 95
four, or more, as desired. To secure a strap, its end is passed outwardly from the bed through a staple, the key, which the band carries, being passed through the staple by being turned endwise, and said key after pass- 100
ing through squares itself, in which position it presents its side against the staple, so as to prevent withdrawal of the strap, or else, if the keys are too large to pass through the

staples, the end of the strap may be passed through and the key inserted afterward in the key-seat outside the staple.

F is what I term the "director," it being a thin flat implement, the advance end of which is adapted for engagement in a pocket *c* of the straps and the rear end of which is conveniently provided with a handle *f*.

The raising-frame being supposed in position down upon the bed, the straps *C* are each as to one end engaged with the successive staples on one of the members *B*. The director *F* is then inserted in the pocket at the free end of the first strap *C* and is with said strap pushed beneath until its advance end is carried beyond the patient, so that said free end may be grasped and passed through the first staple on the opposite member *B* and a key inserted in its appropriate key-seat to retain it in such position while the director is withdrawn and successively employed in connection with the other straps.

In Fig. 5 I show straps *W* extending lengthwise of the frame and interlaced with the transverse straps *C*, the extremities of which straps *W* are secured to the respective end members *b b* in any convenient manner, and as a convenient method of attachment I show said straps *W* as being each provided at each end with a bar *w* and a loose ring *w'*. To secure an end, I pass said end equipped with its bar around a member *b* and pass the bar endwise through the loose ring, and said bar when freed squares itself against the ring to prevent withdrawal. In Fig. 5 the left-hand ends of the straps *W* are shown as already secured in this manner and the right-hand ends as ready to be secured. When all the ends of the straps *W* are secured, the weight of the patient draws the fastening taut. I do not ordinarily employ the straps *W*, but use them only at times when they can be applied to a bed at the time unoccupied and when it is desired to relieve the straps *C* of a part of the weight of the patient.

G G are standards or uprights, two of which are located upon each side of the bed and near the head and foot thereof, respectively, and each preferably resting as to its lower end upon the floor. Each upright is conveniently formed of a metal strip *g* of sufficient length doubled upon itself and having its extremities secured to a suitable foot-plate *g^x*, and each is conveniently provided with a sheave *g'* near its upper end and a sheave *g²* near its lower end.

H is a clamping-block, which is mounted free for vertical adjustment to suit beds of different heights upon each of the uprights and adapted for engagement with the side member or frame of the bedstead, and to such end each clamping-block is provided with a projecting lip *h* and a separate movable jaw *I*. In the application of the uprights each clamping-block is set so that its lip *h* rests upon the side frame of the bed-

stead *A*. The jaw *I* is reversible, so that it is adapted for employment in connection with either angular or round frames. One end is therefore provided with a hammer-shaped head *i* for engagement, as particularly illustrated in Fig. 2 of the drawings, with an angular bed-frame side piece, and the other end is provided with a curved head *i^x* for engagement with a round bed-frame side piece.

i² are screw-bolts, two of which pass through ears of the clamping-block and through holes in the central portion of the jaw *I*, regardless of which end of the latter is uppermost, and are provided with thumb-nuts the tightening up of which draws the jaw toward the clamping-block, so as to tightly clasp the member of the bed-frame with which it is engaged.

To the raising-frame, at or near each of its four corners, respectively, are secured the extremities of lifting-ropes *K*, each of which ropes passes over the sheaves *g' g²* of an upright. The upper end of each rope is provided with a bight or loop *k* and a hook *k'*, embodying in its shank an eye through which the rope *K* passes freely. To secure the rope to a frame, it is passed around a member thereof and the bight or loop in its end engaged with the hook, and thereupon when the rope is drawn taut the whole acts as a noose and tightens upon said member. It will now be understood that when the ropes *K* are all secured to the frame a pull upon said ropes will steadily and evenly elevate the raising-frame from the bed.

In the drawings, I show as the means for effecting the required traction upon the ropes a winding-bar *L* of square cross-section, to which or to drums *M* upon which the lower extremities of the ropes *K* are connected. The winding-bar may be either made as a single integral bar, as shown in Fig. 1, or, if desired, may be made to telescope to adjust it to bedsteads of various sizes, as shown in Fig. 2, in which latter figure the bar is shown as made in two pieces, which are joined by being both entered in a splice-box *L^x*, provided with thumb-screws *l^x*, which hold said pieces in any desired position of adjustment within said splice-box. The drums *M* may be caused to slide along the bar *L* to bring them into the proper positions.

The bar *L* is supported in hangers beneath the bed and extends in parallelism with it, being provided at its extremity near one, and preferably the lower, end of the bed with a worm-wheel *N*, secured to it, so as to turn with it.

O is a worm-provided shaft extending transversely to and beneath or at the end of the bed, and the same is supported in such position that its worm *o* is constantly in mesh with the worm-wheel. In the drawings this shaft *O* is shown as supported as to its outer end in a hanger *P*, depending from the bedstead and as to its inner end in a bracket-casting *Q*. This bracket-casting has two

downwardly-extending lugs, which lie on opposite sides of the worm-wheel N, and in which lugs the shaft L is supported and by means of bushings l of circular exterior 5 made free for rotation therein, and two upwardly-extending ears, which lie one on each side of the worm on the shaft O, and through which ears the squared shaft O passes and is by means of bushings o^x of circular exterior 10 made free for rotation therein. The casting Q therefore constitutes a link connection between the shafts L and O and maintains the worm always in mesh with the worm-wheel, notwithstanding slight variations from the 15 horizontal in the set of said shafts. R is a crank-handle on the outer end of said shaft O, by which said shaft may be rotated.

It will now be understood that upon rotation of the handle R and consequent rotation 20 of the bar L the ropes K will be equally wound upon the drums M and the raising-frame will be consequently elevated and that rotation of said handle in the opposite direction will equally unwind said ropes K and permit of 25 the sinking of the raising-frame. It will also be understood that the sling-straps may be introduced beneath the patient without effort on the part of the latter; that by the provision of several sets of key-seats in said straps 30 the keys may be so set that the bands will have sufficient droop to permit the lowering of the patient into a bath-tub placed upon the bed beneath the elevated raising-frame. It will also be understood that while the form of 35 the invention represented in the drawings is a good embodiment of the same, yet that numerous modifications in the matter of me-

chanical detail and arrangement might be resorted to without departure from my invention.

By unfastening the ropes K from the frame 40 said frame, with the patient upon it, may be carried away from the bed which he has been occupying.

Having thus described my invention, I claim and desire to secure by Letters Patent— 45

1. In combination, a raising-frame formed of end members provided with threads and equipped with thumb screws or nuts, and side members mounted free for movement toward and from each other upon said end mem- 50 bers, whereby said frame is adjustable to bedsteads of different breadths, a supporting-surface, such as the straps mounted on said frame, lifting-ropes connected with said frame, and means for operating said lifting- 55 ropes, substantially as set forth.

2. In combination, a bed-lift or raising-frame provided with staples, lifting-ropes connected with said frame, means for operating said lifting-ropes, flexible straps embodying pock- 60 ets for the purpose set forth, and folds or key-seats, and keys adapted to be seated in said folds and engaged with the staples of the frame, substantially as set forth.

In testimony that I claim the foregoing as 65 my invention I have hereunto signed my name this 23d day of May, A. D. 1890.

HELEN GIBSON MONKHOUSE.

Witnesses:

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