No. 836,889. PATENTED NOV. 27, 1906.

A. M. PARKHILL.

INVALID'S BED.

APPLICATION FILED APR. 21, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

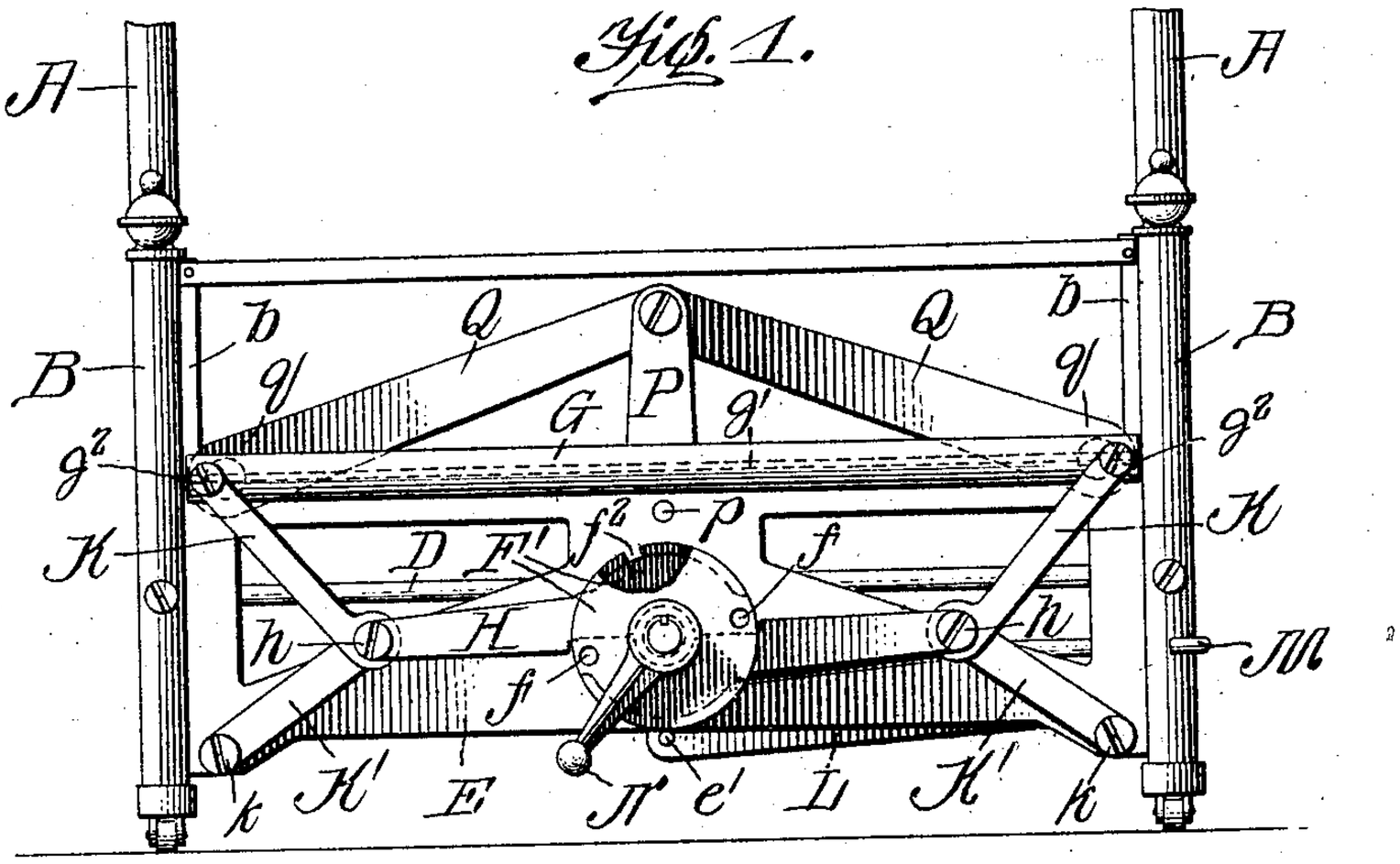
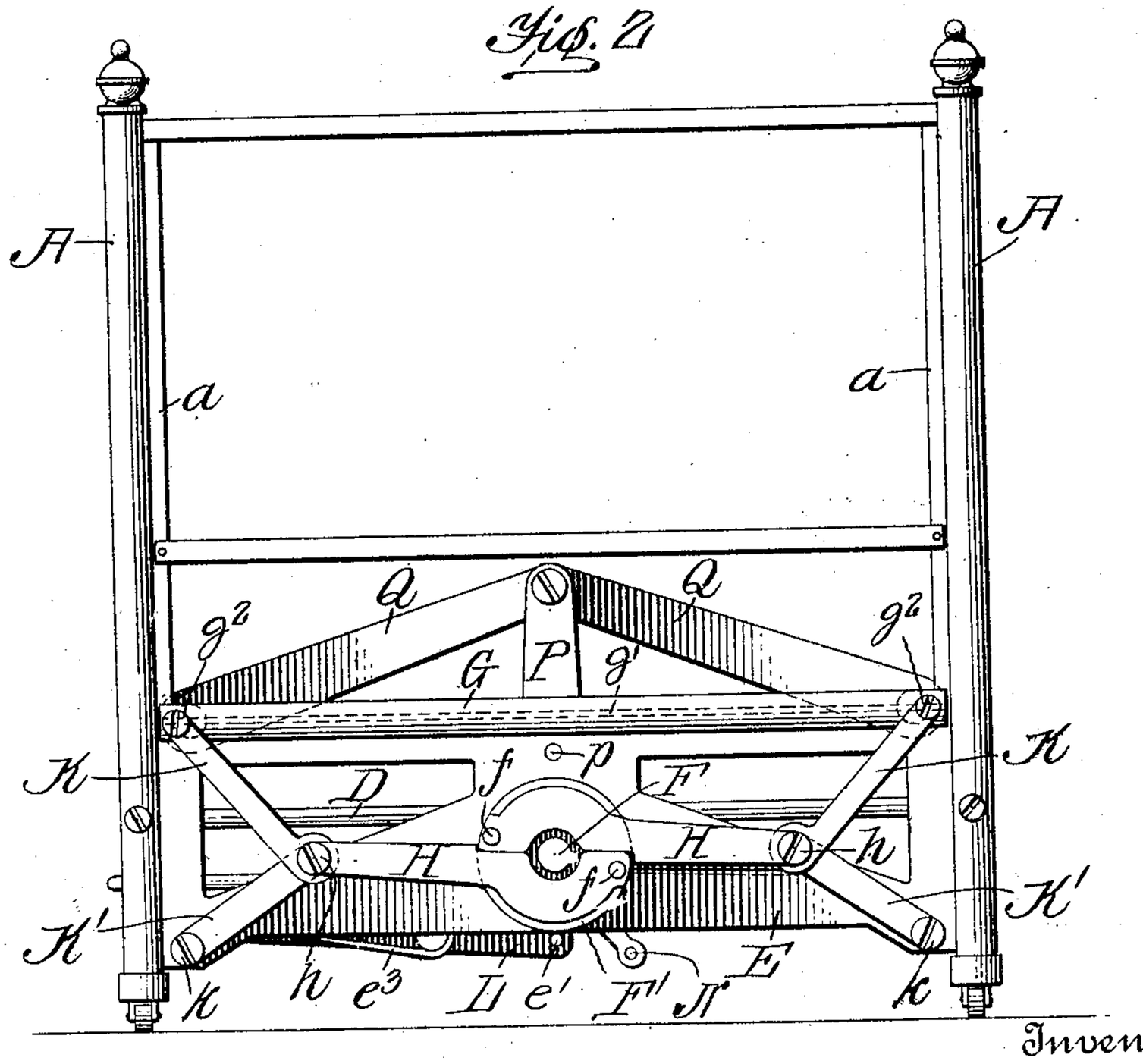


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

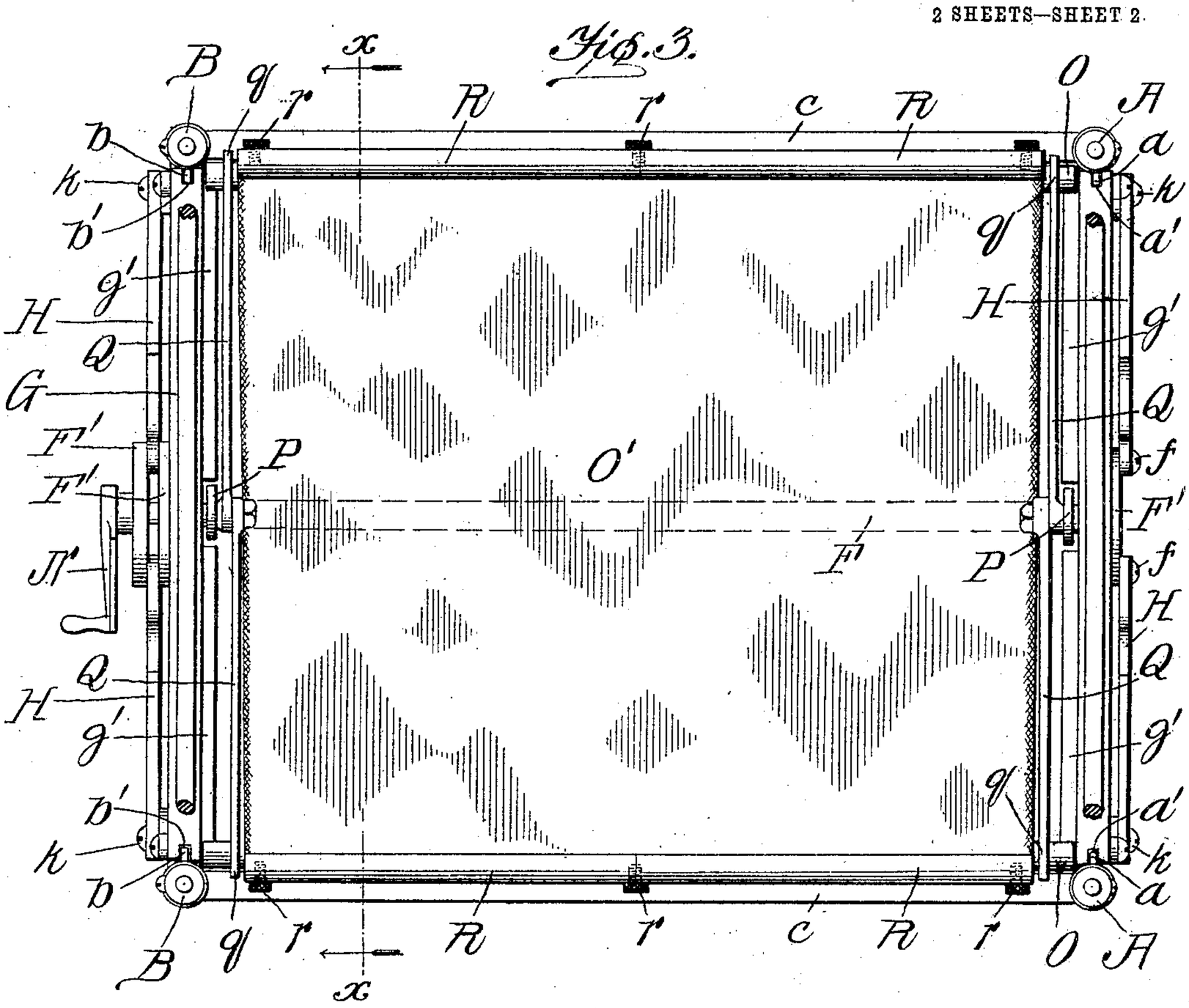


Fig. 4.

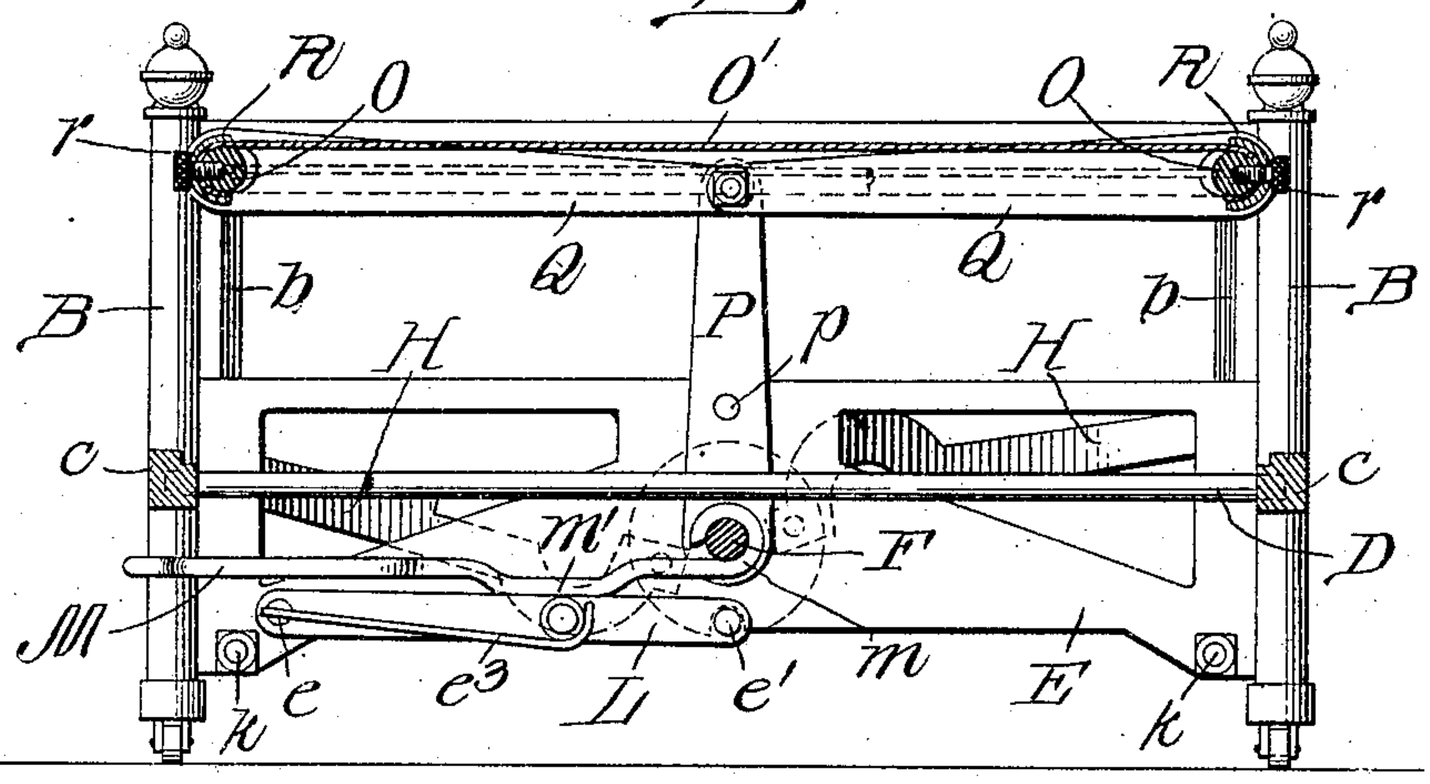
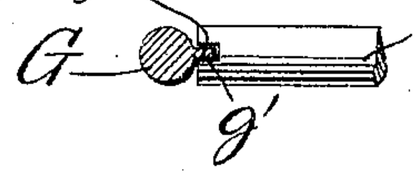


Fig. 5.



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INVALID'S BED.

No. 836,889. Specification of Letters Patent. Patented Nov. 27, 1906.

Application filed April 21, 1906. Serial No. 312,942.

To all whom it may concern:

Be it known that I, ALICE M. PARKHILL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Invalids' Beds, of which the following is a specification.

The invention to be hereinafter described relates to invalid-beds of that general character wherein means are employed for raising or lowering a patient while maintaining a substantially prostrate position.

In this general type of invalid-bed it is desirable to move the patient into the raised or lowered position with positiveness and certainty without jar, to avoid as far as possible the use of racks and pinions or intermeshing gears, which produce noise and are susceptible of uneven action owing to lost motion, and to do away with such lifting devices as straps and the like, which stretch more or less, and thereby cause the lifting-plane to move in a plane inclined to the horizontal. It is likewise a desideratum that the sustaining-sheet or like flexible support on which the patient rests may be given tension when the sustaining-frame is in raised position and that it be readily detachable at desired times.

With these general considerations in view the invention consists of the parts and combinations to be hereinafter described, and definitely pointed out in the claims.

In the drawings, Figure 1 is an end elevation of a bed embodying the present invention and looking at the foot portion thereof, some parts being broken away. Fig. 2 is an end elevation of the head end of the bed. Fig. 3 is a plan view. Fig. 4 is a transverse section on line $x\,x$, Fig. 4; and Fig. 5 is a sectional detail to be described.

The bedstead proper, comprising the head-posts A A, foot-posts B B, and side rails C C, may be provided with any usual or desired character of mattress-support D, that shown being in the form of cross rails or slats. The head-posts A A and the foot-posts B B are connected, respectively, by suitable transverse pieces E E, between which, and preferably below the slats D, extends the operating-shaft F for a purpose to be presently described.

Mounted upon the main bedstead-frame is the stretcher-frame, comprising the rigid head and foot transverse bars G G, the slotted ends a' a' and b' b' of which, Fig. 3, embrace and are guided in their vertical movement by the guides a a and b b, formed in the head and foot posts, respectively. Secured to the end portions of the operating-shaft F are the crank-disks F′ F′, a pair of such disks being preferably secured to the shaft F at the foot and head end portions thereof, and connected to said crank-disks by pins f f are the operating-arms H H, the end portions near pins f f being curved, as best shown in Fig. 2, to embrace the shaft F when the stretcher-frame is in its lowered position, as will presently appear.

Pivotally jointed to the outer ends of the operating-arms H H at h are the toggle-levers K K′, the lower one of each set being pivoted to the head and foot transverse pieces E E at k and the upper one of each set being in like manner connected to the head and foot transverse bars G G, at g^2 g^2.

From the construction thus far described it will be apparent that rotation of the operating-shaft F will operate the toggle-levers K K′ at the head and foot of the bed, to thereby positively and evenly raise or lower the transverse bars G G of the stretcher-frame, which at such times are guided in their vertical movement by the guides a a and b b. When the toggle-levers are in the position shown in Figs. 1 and 2, the stretcher-frame will be in its lowest position, and when the shaft F is turned into the position indicated in Fig. 4 and the toggle-levers are straightened in a manner well understood the stretcher-frame will be in its raised or highest position.

In order to maintain the stretcher-frame in its highest position, a notch f^2 is provided in one of the crank-disks, either at the head or foot of the bedstead, and pivotally connected at e to the piece E, adjacent thereto, is the locking-lever L, having a locking-pin e' in its end adapted to register with the notch f^2 when the shaft F and crank-disks are turned to place the stretcher-frame in its raised position. A spring e^3 tends to normally raise the end of the lever L to cause the pin e' to enter the notch f^2 when said notch is brought into position above it. To enable the lever L to be turned about its pivot e to unlock the crank-disk from the pin e', a trip M is provided, having its end m turned about the operating-shaft F and its other end ex-

tended to the side of the bedstead, its intermediate portion m' bearing on the locking-lever L. To unlock the parts, it is only necessary to depress the outer end of trip M, whereupon the locking-pin e' will be withdrawn from the notch f^2 and the stretcher-frame be allowed to descend.

To control the rising and lowering movement of the stretcher-frame and operate the shaft F as desired, a crank-arm N, having a hand-grip, is secured to one end of the operating-shaft.

In this character of device it is desirable that the supporting sheet or fabric of the stretcher be relatively slack when the stretcher-frame is in its lowest position and that such sheet or fabric be automatically tightened gradually as the stretcher-frame is raised to its raised position, and as one of the forms of mechanism that embodies the present invention in these respects I have devised the following:

Each of the transverse bars G G, one at the head and one at the foot of the bed and directly connected to the toggle-lever mechanism already described, is provided with a longitudinally-disposed rib or flange g' g'. (Shown in full lines, Fig. 3, and by dotted lines, Figs. 1 and 2.)

The side bars O of the stretcher-frame, to which the fabric or stretcher-frame bottom O′ is secured by means presently to be described, have slotted ends, as best shown by detail in Fig. 5. These slotted ends of the stretcher side bars embrace the rib or flange g' g' of the transverse bars G G at the head and foot ends of the bed, so as to be movable transversely of the bed upon such ribs or flanges.

Centrally secured at the foot and head ends of the bed, respectively, are the stationary uprights P, the lower ends whereof preferably embrace the operating-shaft F and are then secured to the head and foot transverse pieces E by pins p. Pivotally connected to the upper ends of the stationary uprights P are the stretching-bars Q, the outer ends of each of which are jointed to the ends of the side bars O of the stretcher-frame, as best seen in Figs. 1 and 3 at q. From this construction it will be seen that as the transverse bars G G of the stretcher-frame are raised by the toggle-levers in the manner already described the stretching-arms Q Q will be brought more nearly onto a straight line and will thereby separate the side bars O O of the stretcher-frame as the latter rises to its upper position, and conversely as the stretcher-frame is lowered the stretching-bars Q Q will draw the side bars O O of the stretcher-frame toward each other, to thereby slacken the bottom of the fabric O′.

In order that the bottom of the fabric may be readily detached from the side bars O O of the stretcher-frame, the same is preferably secured thereto by means of semicircular pieces, preferably of metal, R. The bottom of the fabric O′ being passed about the side bars O O of the stretcher-frame, the semicircular clamping-pieces are then placed about the fabric at the point where it passes over the side bars, and such semicircular clamping-pieces may be secured to the side bars in any suitable manner, as by set-screws r. In the construction already shown these semicircular clamping-pieces R are two in number for each side of the bottom of the fabric, and a set-screw r is placed over their adjacent ends and a like set-screw r through their remote ends to securely hold the semicircular clamping-pieces R and the fabric clamped thereby to the side rails O O of the stretcher-frame.

From the construction described it will be noted that the toggle arrangement for raising and lowering the stretcher-frame avoids the use of all ratchets, pinions, and gears, which are undesirable in an invalid-bed structure, where noise and lost motion are often a serious detriment to the comfort of the patient, and such toggle construction enables a positive, even, and uniform motion to be given to the stretcher-frame as it is raised and lowered. Moreover, when in raised position the toggles themselves act as a locking means for holding the stretcher-frame in its raised position, and this may be all that is desirable in some cases; but a special locking device, as I have already described, may be also employed. By the construction described also not only can the bottom of the fabric of the stretcher-frame be readily detached and replaced, but the fabric itself will be tautened or stretched widthwise as the stretcher-frame rises and by virtue of the general mechanism hereinbefore described, which illustrates one of the many forms in which these results may be accomplished.

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

1. In an invalid-bed, the combination of a main bed-frame, a stretcher-frame having a bottom fabric, an operating-shaft mounted in the main bed-frame, toggle-link connections between said main and stretcher frame operating-arms connecting said shaft with said toggle-arms, and means for stretching the bottom fabric of the stretcher-frame as the latter is raised.

2. In an invalid-bed, the combination of a main bed-frame, a stretcher-frame having a bottom fabric and comprising transverse bars, side bars connected to the transverse bars and movable toward and from each other, toggle-link connections between the main bed-frame and the transverse bars of the stretcher-frame, and means for separating the side bars of the stretcher-frame from each other as the stretcher-frame is raised.

3. In an invalid-bed, the combination of a main bed-frame, a stretcher-frame having a bottom fabric and comprising transverse bars, side bars connected to the transverse bars and movable toward and from each other, toggle-link connections between the main bed-frame and transverse bars of the stretcher-frame, stretching-bars having a fixed pivotal connection with the main frame, and jointed at their opposite ends to the side bars of the stretcher-frame to move the side bars of the stretcher-frame from and toward each other as the said frame is raised and lowered.

4. In an invalid-bed, the combination of a main bed-frame, a stretcher-frame having a bottom fabric, an operating-shaft mounted in the main bed-frame and provided with crank-disks, toggle-link connections between the main bed-frame and the stretcher-frame at the head and foot ends thereof, operating-arms connecting the crank-disks with the toggle-link connections, a locking device for securing the stretcher-frame in its raised position, and a trip extending to one side of the main bed-frame for tripping the locking device.

5. In an invalid-bed, the combination of a main bed-frame, a stretcher-frame having a bottom fabric, an operating-shaft mounted in the main bed-frame and provided with crank-disks, toggle-link connections between the main bed-frame and the stretcher-frame at the head and foot ends thereof, operating-arms connecting the crank-disks with the toggle-link connections, means for stretching the bottom fabric of the stretcher-frame as the latter is raised, a locking device for securing the stretcher-frame in its raised position, and a trip extending to one side of the main bed-frame for tripping the locking device.

6. In an invalid-bed, the combination of a main bed-frame, a stretcher-frame having a bottom fabric and comprising transverse bars each provided with a rib or flange, side bars engaging said ribs or flanges and movable thereon toward and from each other, toggle-link connections between the main frame and transverse bars of the stretcher-frame, and stretching-bars having a fixed pivotal connection with the main frame and jointed to said side bars of the stretcher-frame to stretch the fabric thereof as the stretcher-frame is raised by the toggle-links.

7. In an invalid-bed, the combination of the main bed-frame, an operating-shaft mounted therein and extending to the head and foot portions thereof, vertical guides carried by the main frame, a stretcher-frame having a bottom fabric, and comprising transverse bars engaging said guides, said bars being provided with ribs or flanges at right angles to said vertical guides, side bars movable toward and from each other on said ribs or flanges, toggle-link connections between the main bed-frame and said transverse bars, operating-arms connecting the operating-shaft to said toggle-links, and means for operating said shaft.

8. In an invalid-bed, the combination of the main bed-frame, an operating-shaft mounted therein and extending to the head and foot portions thereof, vertical guides carried by the main frame, a stretcher-frame having a bottom fabric, and comprising transverse bars engaging said guides, said bars being provided with ribs or flanges at right angles to said vertical guides, side bars movable toward and from each other on said ribs or flanges, toggle-link connections between the main bed-frame and said transverse bars, stretching-arms pivoted to a fixed point at one end and having their opposite ends jointed to the side bars, operating-arms connecting the operating-shaft to said toggle-links, and means for operating said shaft.

9. In an invalid-bed, the combination of a main frame, a stretcher-frame having side bars, a bottom fabric therefor, semicircular clamping-plates for securing the bottom fabric to said side bars, a toggle-link connection between the main frame and stretcher-frame, and means for separating the side bars of the stretcher-frame as the latter is moved into its raised position.

In testimony whereof I affix my signature in presence of two witnesses.

ALICE M. PARKHILL.

Witnesses:
HENRY A. PHILLIPS,
FRED E. R. JONES.