

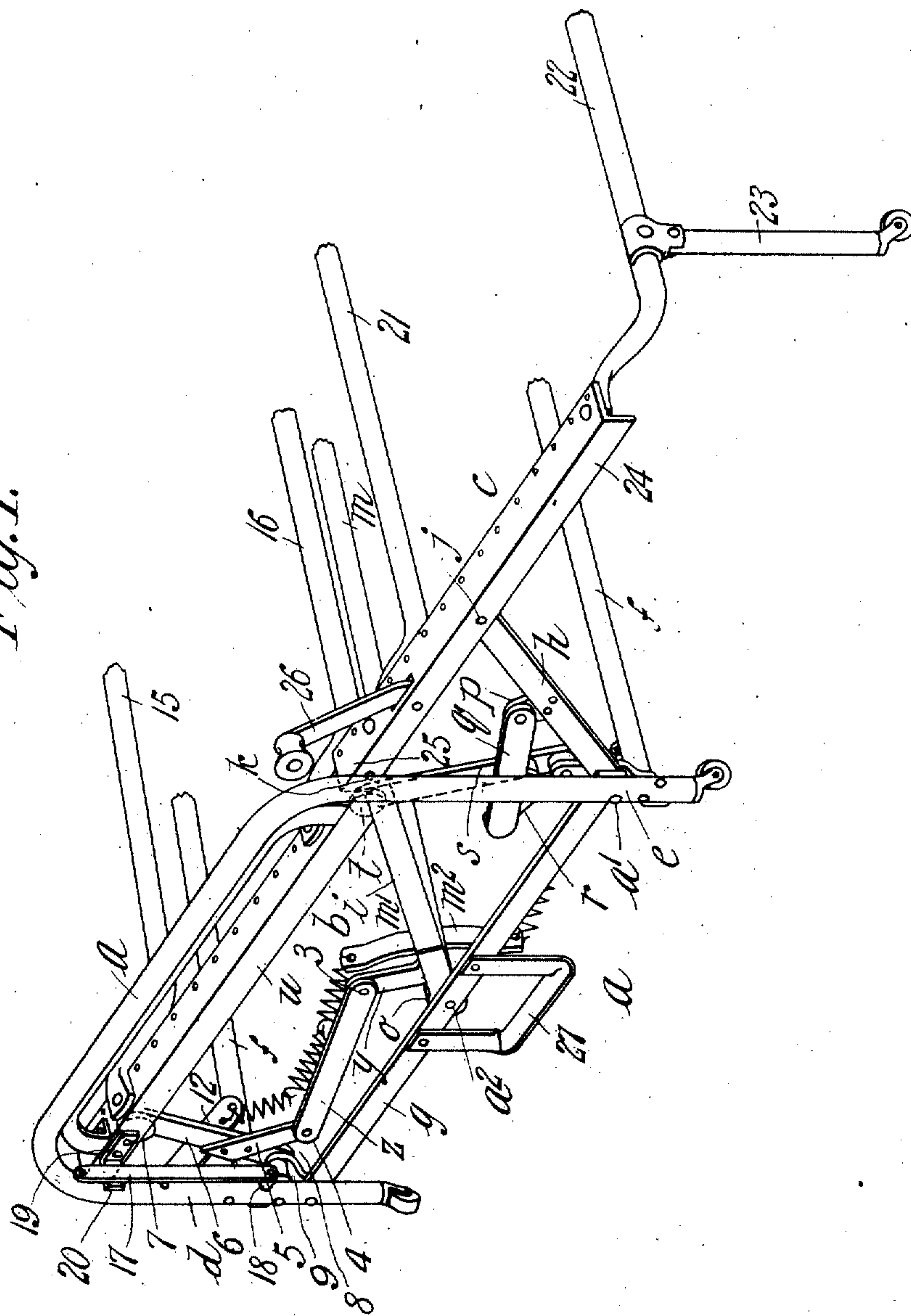
990,608.

F. M. TINKHAM.  
COUCH BED.  
APPLICATION FILED OCT. 22, 1910.

Patented Apr. 25, 1911.

2 SHEETS—SHEET 1.

Fig. 1.



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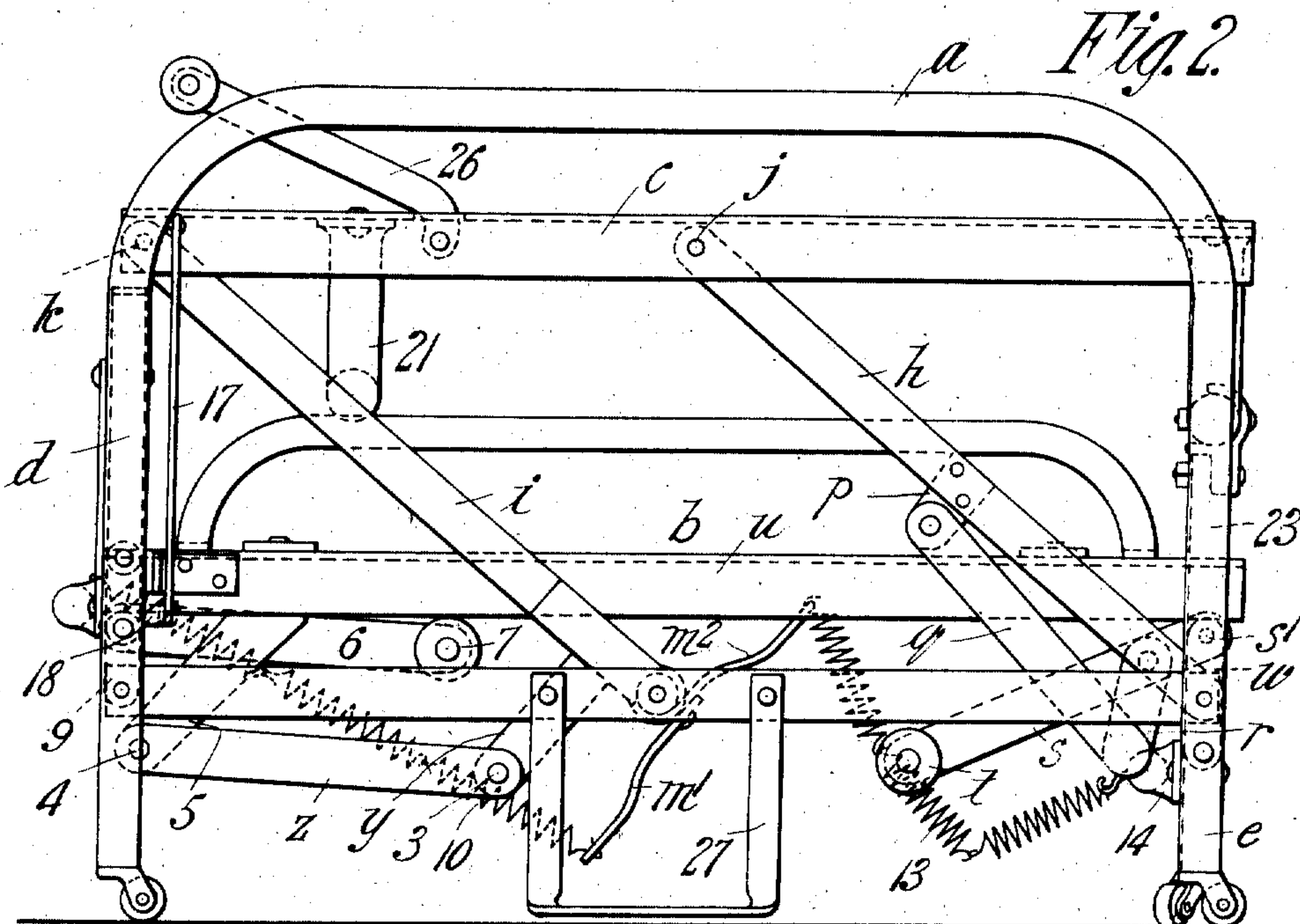
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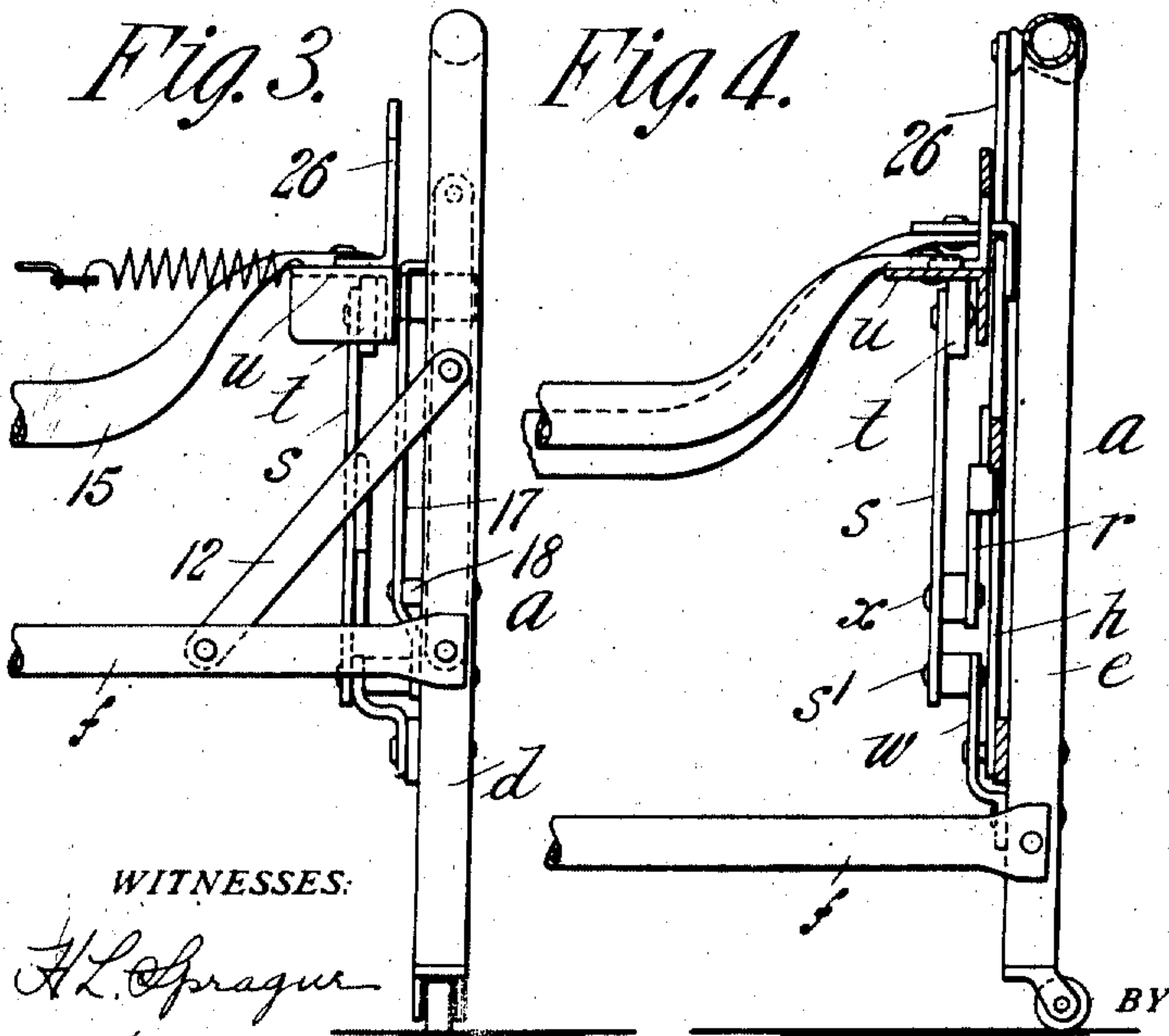
2 SHEETS-SHEET 2.

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*Fig. 3.*

*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

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COUCH-BED.

990,608.

Specification of Letters Patent.

Patented Apr. 25, 1911.

Application filed October 22, 1910. Serial No. 588,416.

To all whom it may concern:

Be it known that I, FRANCIS M. TINKHAM, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Couch-Beds, of which the following is a specification.

My present invention relates to improvements in couches and more particularly of the type known as foldable or extension couches in which two movable bed-frames are employed. Each of these frames contains a wire or other fabric and they are adapted to be moved into horizontal alignment one with the other so that when the movable bed-frames are so arranged the area of the couch is double what it is when folded.

The objects of the invention are,—to provide a couch structure in which a fixed or stationary frame is used for receiving one of the movable bed-frames that is adapted to rise and fall vertically in the stationary frame when the other movable bed-frame is operated, both during the opening and closing operations; to provide means for rigidly supporting the two movable bed-frames so that they will not accidentally fold after being opened; to provide anti-friction devices so that during the opening operation the bed-frame that is located in the stationary frame is raised from its depressed position with very little mechanical effort; to provide connecting means between the two bed-frames so that they are nearly balanced during the opening and closing operations.

In the drawings forming part of this application,—Figure 1 is a perspective view of one end of the couch showing the bed-frames in open position and clearly illustrating the construction for opening and closing the couch. Fig. 2 is an end elevation showing the two bed-frames nested one over the other in the stationary member or frame. Fig. 3 is a detailed end elevation of one of the posts of the fixed frame illustrating the means for confining the movements of one of the bed-frames in a vertical plane. Fig. 4 is a vertical, sectional view of Fig. 3 considered in a vertical plane passing through the center portion of the fixed frame.

Referring to the drawings, *a* designates, as a whole, the fixed frame; *b* the vertically movable bed-frame in the fixed frame *a*; *c*

the bed-frame which is connected to the vertically movable bed-frame *b* and is adapted to be extended into the position shown in Fig. 1 so as to be in horizontal alignment with the frame *b*.

The fixed frame *a* comprises the usual end-frames having the upright members *d* and *e*, and the side-bars *f* at the lower portion of the upright members.

*g* designates a brace-bar extending transversely of the fixed frame *a* and connecting the lower portions of the uprights.

Pivotaly attached to the fixed frame *a*, at *a'* and *a''* are two parallel links *h*, *i*, their upper ends being pivotally connected to the frame *a* at the points *j* and *k*. These two links are, in effect, of parallel ruler construction. Extending longitudinally of the frame *a* is a rock-shaft *m* that is pivotally mounted on the brace-bar *g*. The link *i* is rigidly connected to this rocker-shaft at its lower end, as shown at *o*. Secured to the link *h* is an ear-piece *p*, and pivotally attached thereto is the arm *q*, to the outer end of which is rigidly secured a second arm *r* to which is pivotally secured an arm *s* that is provided with a roller *t* at its outer end. The arm *s* is pivotally attached to the frame *a* at *s'*. This roller, as will be observed by referring to Fig. 1, is located beneath the horizontal web of the angle-iron *u* of the bed-frame *b*. The arm *s* is pivotally connected at its lower end to the upright member *e* of the frame *a* by means of a bracket *w*, at the point *s'*. The arm *r* is pivotally attached to the arm *s* at the point *w*.

Rigidly secured to the link *i* is an arm *y*, and pivotally attached to this arm is the link *z* at the point *z'*. Pivotaly attached to the opposite end of the link *z* at the point *z''* is an arm *5* which is rigidly secured to the swinging member *6*, the upper end of which is provided with a roller *7* which, like the roller *t*, is adapted to engage the under side of the horizontal web of the angle-iron *u* of the frame *b*. The member *6* is pivotally attached to the upright member *d* at the point *8* by means of the strap-iron *9*, the lower end of which is attached to the upright member *d*.

The rock-shaft *m* is provided with a pair of oppositely extending arms *m'*, *m''*. A spring *10* is attached to the arm *m'* at one end, and its opposite end is attached to a brace-bar *12* which is secured to the upright member *d* and the bar *f*.



13 designates a second spring, one end of which is attached to the arm  $m^2$  and its outer end to a bracket 14 on the upright member  $e$  of the frame  $a$ . These springs are for the purpose of assisting the operator in raising and lowering the frame  $c$  during the closing and opening operations.

15 and 16 designate the brace-rods that are attached to the angle-iron  $u$  of the vertically movable bed-frame  $b$ .

In order to confine the movements of the movable bed-frame  $b$  to a vertical plane, strips of iron 17 are attached to the uprights  $d$  and  $e$  in spaced relation therefrom by means of the short, cylindrical members 18.

Secured to the angle-iron  $u$  is a right-angled piece 19 having an outwardly extending end 20 which moves in the space between the upright and the strips of iron 17, as clearly shown in Fig. 1.

The bed-frame  $c$  is provided with longitudinal brace-bars 21 and 22, the bar 22 being provided with a supporting leg 23 which receives the weight of the frame  $c$  when in an extended position. The inner end of the angle-iron 24 of the frame  $c$  rests on the angle-iron  $u$  of the frame  $b$  when opened, as shown at 25. A lifting or operating handle 26 is attached to the angle-iron 24 of the frame  $c$  and when the operator lifts upward on this handle, when the frame  $c$  is open, the parallel links  $h$  and  $i$  will move from the position shown in Fig. 1 to that shown in Fig. 2, and the frame  $b$  will gradually be depressed to the position shown in Fig. 2.

The weight of the elevated bed-frame  $b$  is borne by the arms  $s$  and 6 in which position rollers  $t$  and 7, at their upper ends, engage the under side of the horizontal web of the angle-iron  $u$ .

In the lowermost position of the frame  $b$ , the upturned ends 20 rest upon the cylindrical members 18 at the lower end of the space between the elements 17 and the uprights of the fixed frame.

The frame  $c$ , when in folded position as shown in Fig. 2, is supported by means of the links  $h$  and  $i$  and the leg 23.

In order to open the couch, the operator lifts on the bed-frame  $c$  by means of the handle 26. The first upward movement thereof elevates this arm with the link members  $h$  and  $i$ , which, in turn, cause the arms  $s$  and 6 with their rollers  $t$  and 7 to simultaneously move upward and engage the horizontal web of the angle-iron member  $u$  of the frame  $b$ . At this point in the opening operation, the weight of the bed-frame  $c$  is thrown onto the bed-frame  $b$  serving to assist the operator in elevating the frame  $b$ .

The moment the operator commences to lift the frame  $c$ , the spring 10, through the arm  $m^1$  and the rock-shaft  $m$ , assists the operator in raising the frame  $c$ . When the

latter is carried over into the open position, the spring 13 on the opposite side of the rock-shaft  $m$  is placed under tensile stress to assist the operator in closing the couch. After the frame  $b$  has reached its uppermost position, as shown in Fig. 1, the weight of the same is carried by the arms  $s$  and 6, the lower ends of which, as stated above, are pivotally connected with the main frame  $a$  and stand in almost a vertical position (see Fig. 2).

The outwardly bent ears 20 serve, in addition to the arms  $s$  and 6, to prevent any lateral movement of the bed-frame  $b$  during its rising and falling movements, and also prevent any danger of the couch closing after it is opened.

It should be particularly borne in mind that the rollers  $t$  and 7 simultaneously engage the lower side of the horizontal web of the angle-iron  $u$  of the bed-frame  $b$ , whereby the opposite edges of this frame are maintained in a horizontal position.

27 is a foot-rest, as shown in Fig. 1, which is attached to the brace-bar  $g$ , the operator placing his foot thereon during the opening and closing operation in order to steady the frame  $a$  on the floor and prevent its rolling.

It should also be understood that the opposite ends of the couch are provided with an operating mechanism like that already described which is operated by the rock-shaft  $m$ .

What I claim, is:—

1. In a couch-bed, the combination with a pair of movable bed-frames, of a fixed frame, one of the movable bed-frames being confined to a vertical movement in the fixed frame, parallel lever connections between the movable bed-frames for causing one of the frames to have an upward movement while the other falls, a rocker-shaft to which one of the lever connections is secured, and link connections between the rocker-shaft and the bed-frame which has a vertical movement.

2. In a couch-bed, the combination with a fixed main frame, of movable bed-frames adapted to be placed in horizontal alignment, levers having pivotal connections at their ends between the fixed frame and one of the movable bed-frames, means associated with the levers and the other movable bed-frame for causing said other frame to rise and fall in a vertical plane when the first movable bed-frame is operated, and antifriction devices for lessening the effort for operating the movable frame that is in the fixed frame, a rock-shaft in the main frame and link connections between the shaft and the vertically movable frame.

3. In a foldable couch having in combination a pair of bed-frames, a fixed frame for confining one of the bed-frames of the couch to a vertical plane during the opening and



closing operations, a second bed-frame adapted to operate the vertically movable bed-frame, means for substantially balancing the weight of the two bed-frames during the opening and closing movements of the couch comprising a rock-shaft, link-connections between the shaft and one of the bed-frames, and arms operable from the link connections which engage the other bed-frame.

4. In a couch-bed, the combination with a pair of bed-frames adapted to be moved into a horizontal plane when in open position and into two parallel horizontal planes when in another position, of a fixed frame for confining the movements of one of the frames during the opening and closing operations to a vertical direction, a pair of link members attached to the fixed frame and one of the frame members, arm elements associated with the link members, antifriction rollers on the upper ends of the arm elements, said elements being so arranged that they support one of the frames when in an open position, and connecting means between the link members and the arm elements.

5. A couch-bed having in combination a main-frame and two bed-frames, one of the frames being connected to the main frame by link members, a pair of supporting arms pivotally attached to the main frame for supporting the other bed-frame when elevated, and connecting means between the two frames for causing the same to move in unison when opening and closing, and means including arm elements operable from the link members whereby the weight of one of the frames is transmitted to the other so as to assist in lifting the bed-frame to an open position.

6. A foldable couch comprising a fixed frame having supporting uprights, a pair of bed-frames, strips secured to the uprights and spaced therefrom, one of the bed-frames, during its opening and closing operations being guided by the strips, link connections between the bed-frames for simultaneously operating the same when moved into their open or closed positions.

7. A couch-bed comprising a main frame,

bed-frames adapted to be nested into the main frame, means for moving the bed-frames into a horizontal plane when the couch-bed is open, and into two horizontal planes when the bed is closed and nested in the main frame, arm supporting devices for one of the bed-frames when open, a rock-shaft, an arm connected thereto, and a link between the arm and the arm-supporting devices.

8. A convertible couch-bed having in combination a main frame, a pair of bed-frames adapted to be nested in the same when the bed is closed, and in the same plane when open, a pair of links connected to the main frame and one of the bed-frames, arms attached to the main frame for supporting the other bed-frame when in an elevated position in the main frame, and link connections between the pair of links and the supporting arms.

9. A convertible couch-bed having in combination a main frame, a pair of bed-frames adapted to be nested in the same when the bed is closed, and in the same plane when open, a pair of links connected to the main frame and one of the bed-frames, arms attached to the main frame for supporting the other bed-frame when in an elevated position in the main frame, and link connections between the pair of links and the supporting arms, one of the frames having its inner edge resting on an edge of the other when in an elevated position.

10. A convertible couch-bed having in combination, a main frame, a pair of bed-frames adapted to be nested therein when the bed is closed and in the same plane when open, means on the main frame for guiding one of the bed-frames in a vertical plane during the opening movements, links between the main frame and the other frame, arms operated therefrom during the opening operation to lift the vertically movable bed-frame and to support the same when the two bed-frames are open and in the same plane, substantially as described.

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Witnesses:

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