

W. C. JAMES.

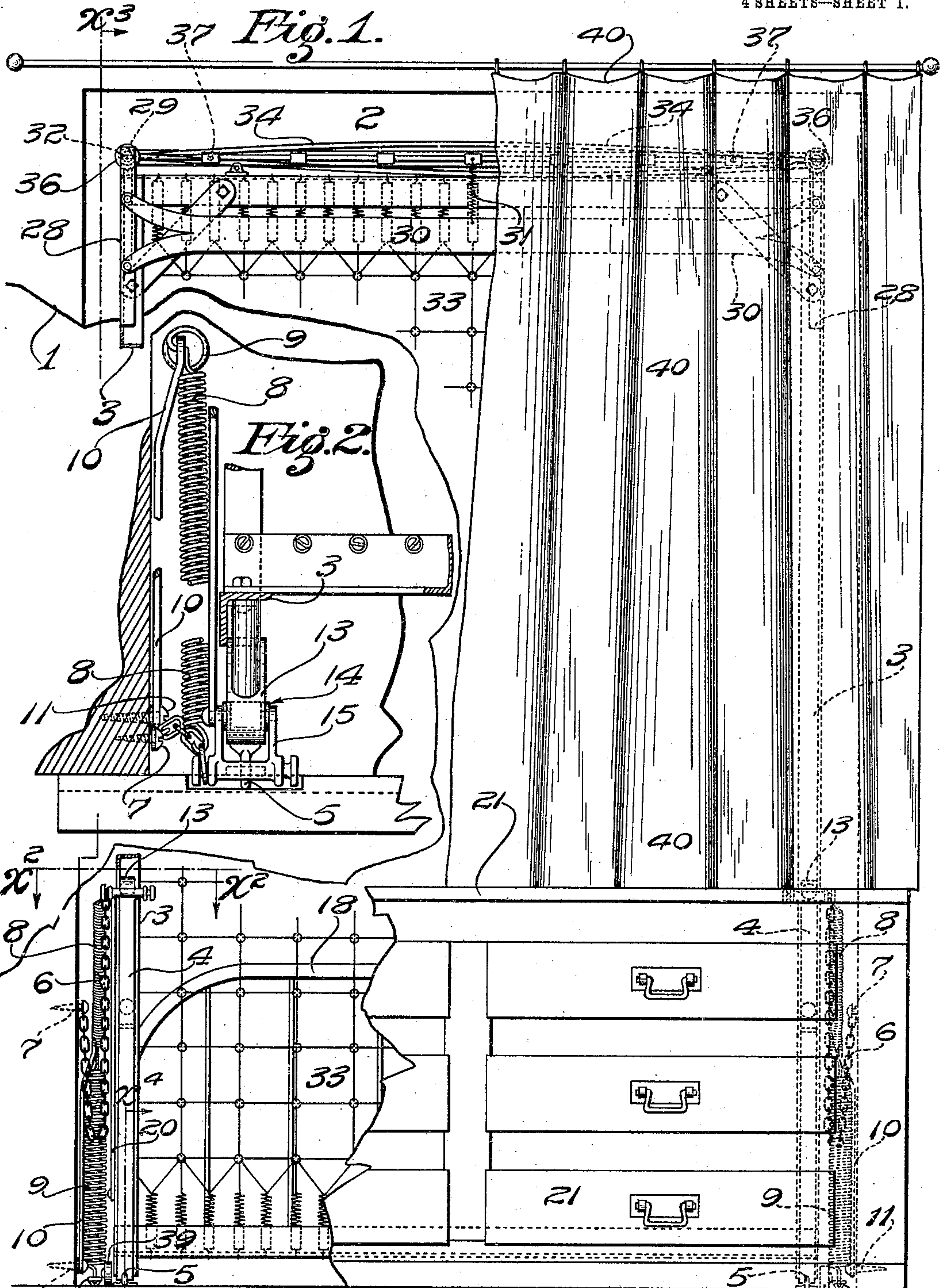
WALL BED.

APPLICATION FILED APR. 18, 1907.

Patented July 27, 1909.

4 SHEETS—SHEET 1.

929,595.



Witnesses:  
R. N. Fishby  
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4 SHEETS—SHEET 2.

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Fig. 4.

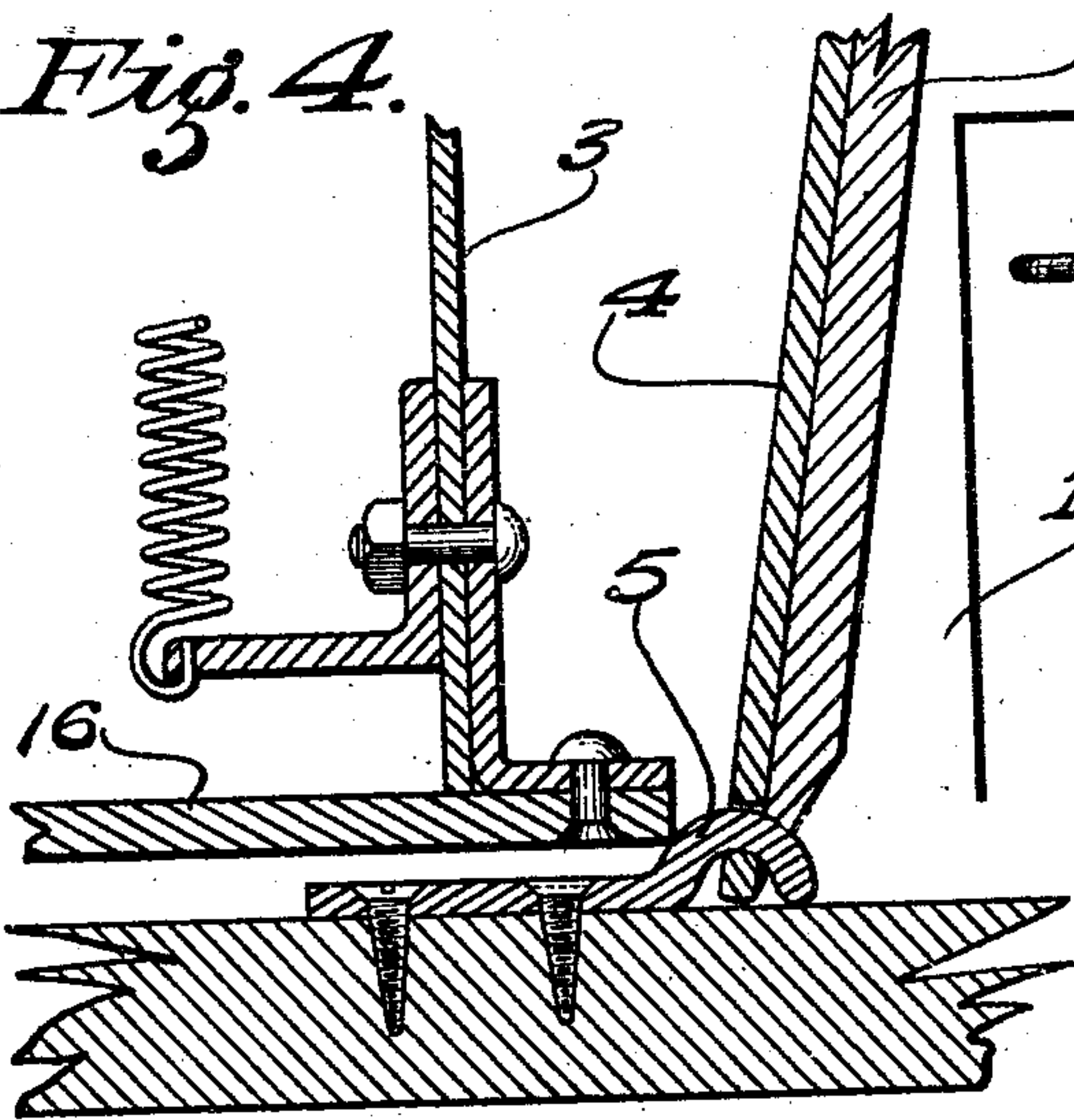


Fig. 3.

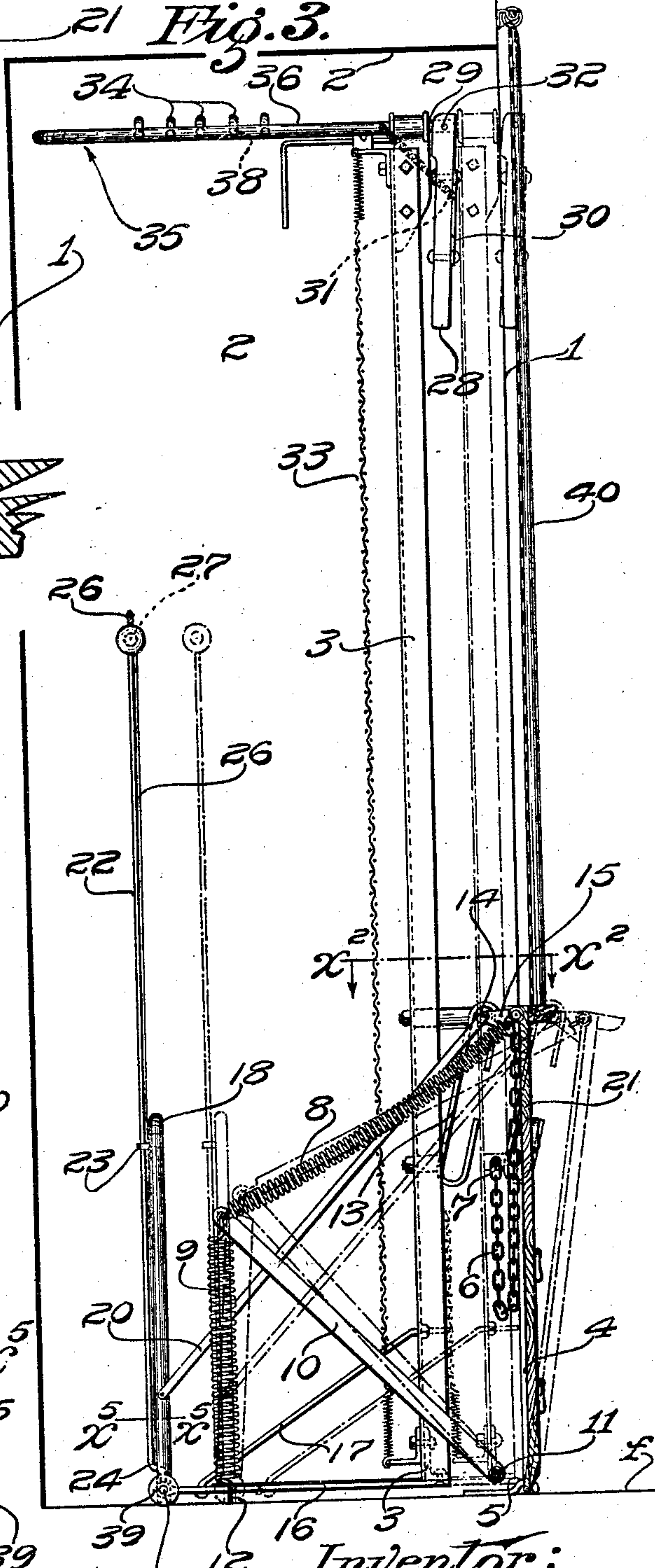


Fig. 5.

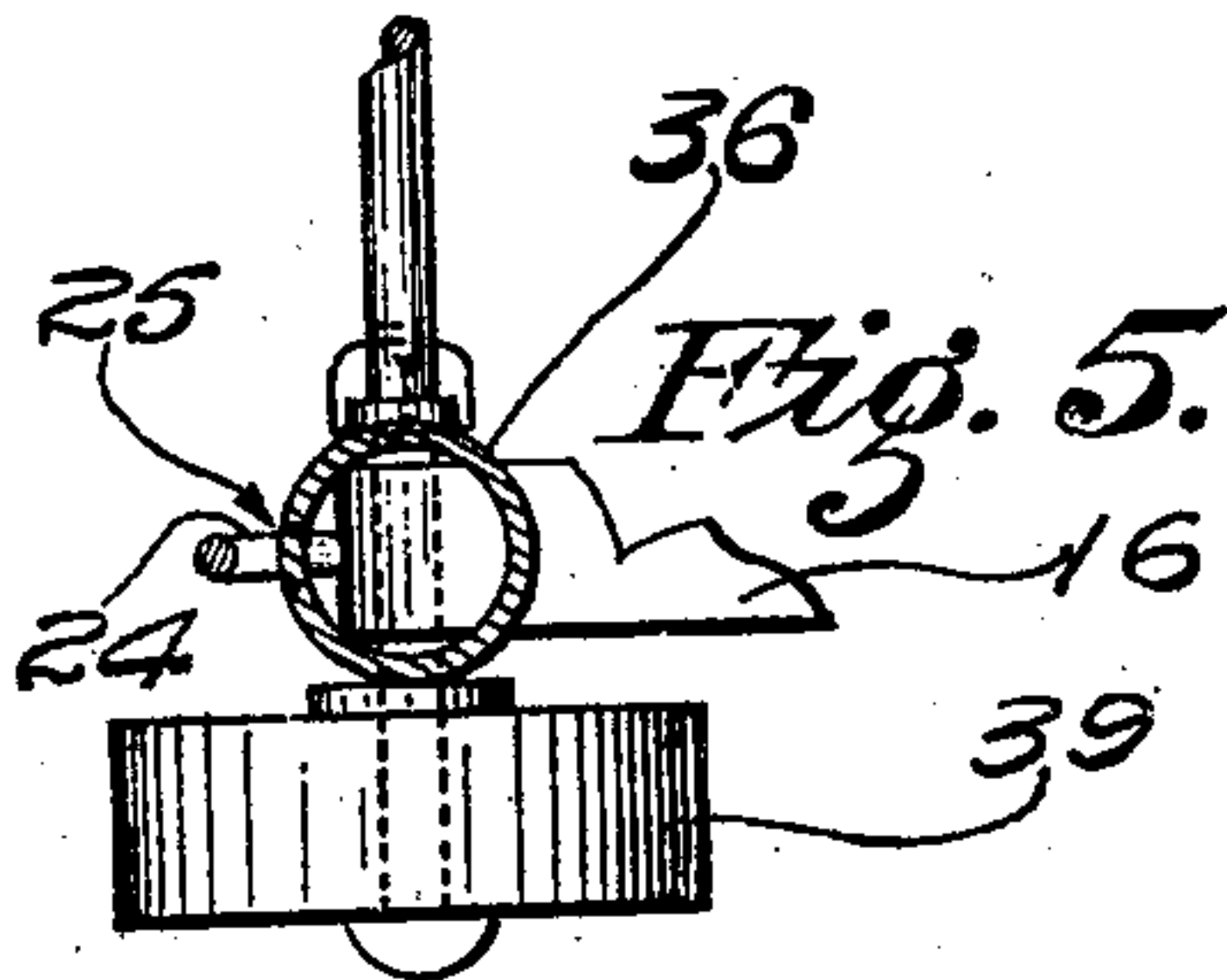
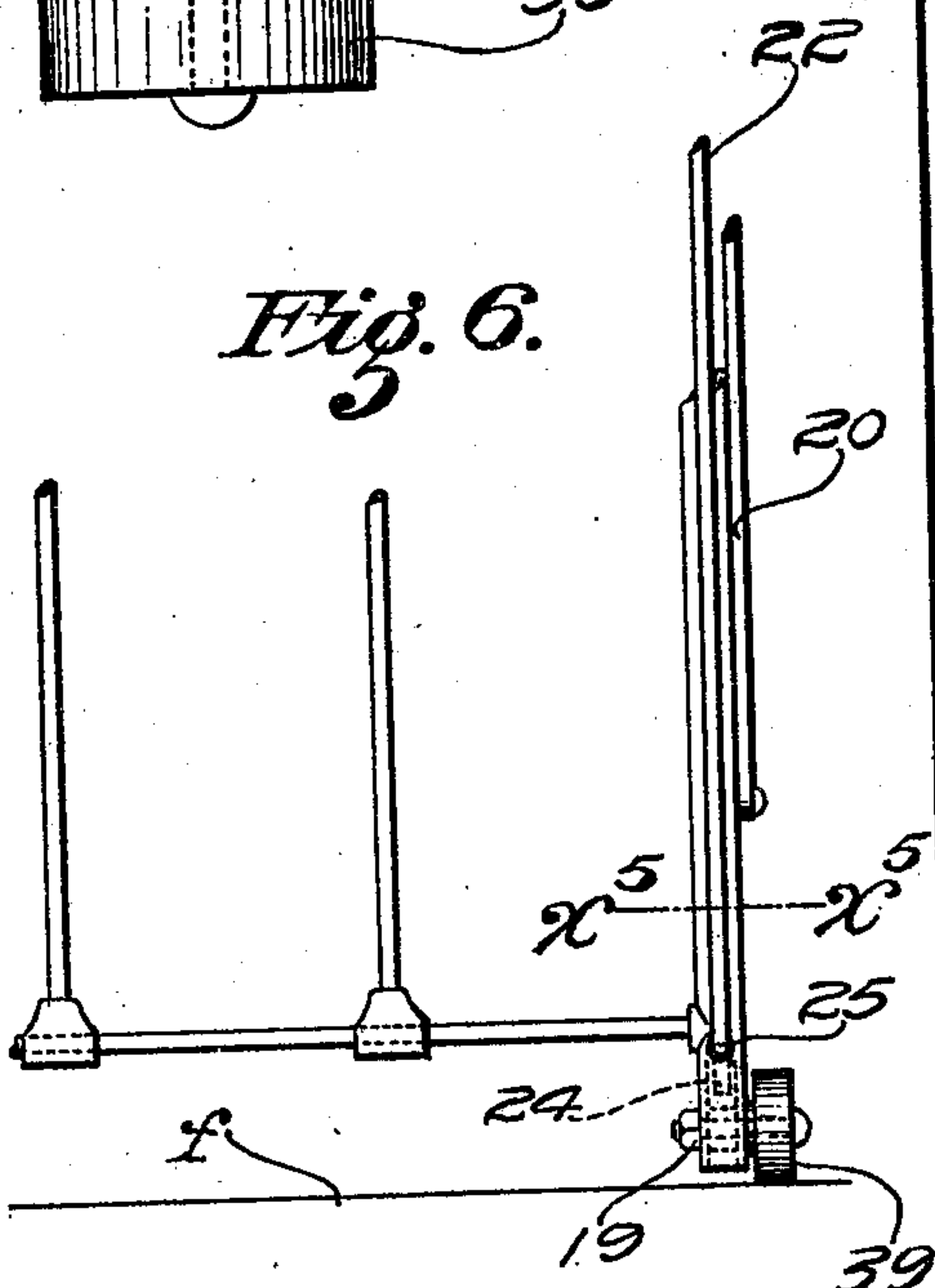


Fig. 6.



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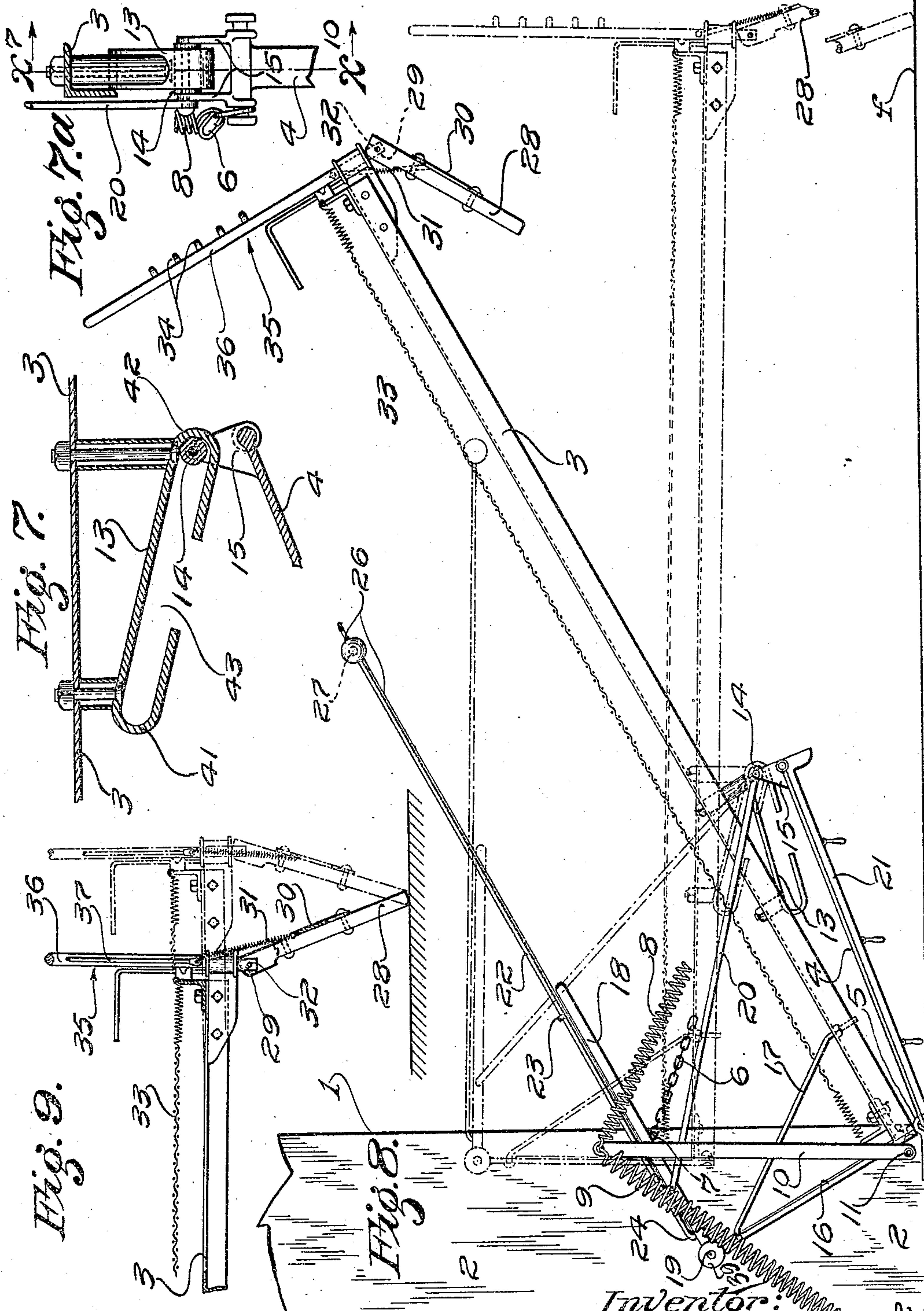
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4 SHEETS—SHEET 3.



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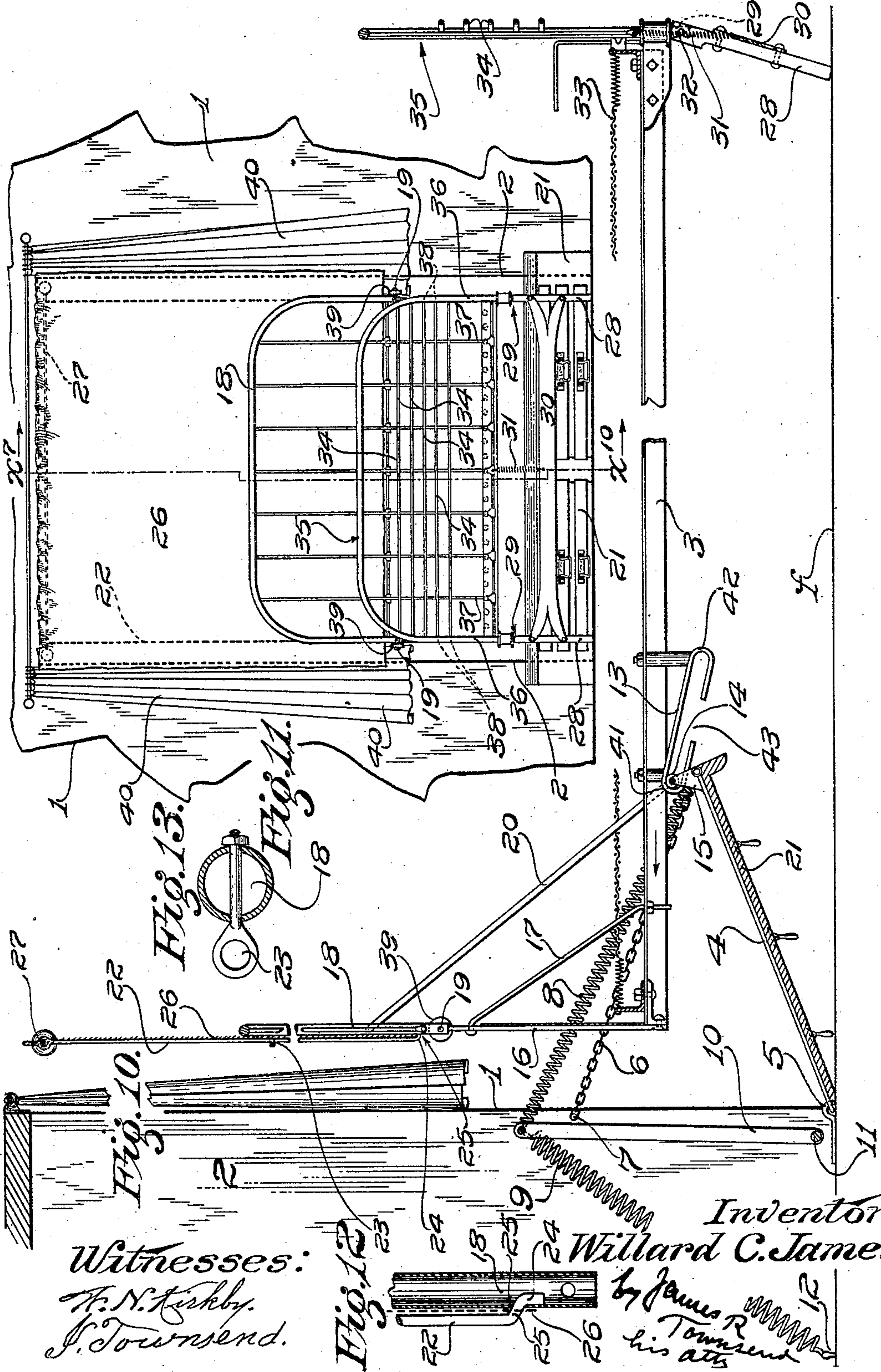
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4 SHEETS—SHEET 4.

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# UNITED STATES PATENT OFFICE.

WILLARD C. JAMES, OF LOS ANGELES, CALIFORNIA.

## WALL-BED.

No. 929,595.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed April 18, 1907. Serial No. 369,002.

*To all whom it may concern:*

Be it known that I, WILLARD C. JAMES, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Wall-Beds, of which the following is a specification.

This invention relates to that class of beds in which the bed frame is arranged to be folded into an upright position in a recess in a wall.

An object of this invention is to so construct and mount the device that in the act of swinging the bed down and bringing it into position for use, the frame will be automatically projected out of the recess in which it is stored when not in use, so that when the bed is ready for use it will stand out in the room in the manner of ordinary standing beds.

Another object is to provide novel means for concealing the opening in the wall and giving the appearance of an ordinary standing bed, when the bed is in position for use.

Other objects are facility of operation, compactness when folded and stability when in position for use.

Another object is to provide a novel arrangement of wall bed, operable without the use of extraneous weights, the appliances being so arranged that throughout a portion of the movement of the bed it is so nearly pivoted at the center of gravity that it can be readily moved by the application of slight force; spring means of maximum efficiency and uniformity of action during contraction and expansion, being provided to assist in sustaining the bed throughout a portion of its downward movement and to assist in lifting the bed throughout a portion of its upward movement.

A further object is to so construct and mount the head-board that the same may be of attractive height and may be folded and unfolded automatically by manipulation of the bed frame and that may be used as a lever to assist in bringing the bed into and out of its finally lowered position.

Another object is to provide a novel and unobstructive support for the head of the bed.

Other objects and advantages may appear from the subjoined detailed description.

The accompanying drawings illustrate the invention.

Figure 1 is a broken front elevation of a wall bed embodying this invention with one form of concealing means, the bed being in upright or folded position and the concealing means on one side being omitted for clearness of illustration. It is to be understood that the opposite sides of the bed are of like construction. Fig. 2 is an enlarged fragmental sectional plan detail of operative mechanism at one side of the bed. Line  $x^2$ , Figs. 1 and 3 indicate the plane of section. Fig. 3 is an elevation viewed from the left of line  $x^3-x^3$ , Fig. 1. Fig. 4 is an enlarged fragmental, sectional detail of a lower portion of the bed frame and the bracket by which the bed is connected with the floor. The parts are in the position indicated by dotted lines in Fig. 3, when the bed has been pulled forward into position where it begins to tilt outward. Fig. 5 is a fragmental plan detail on line  $x^5-x^5$ , Figs. 3 and 6. Fig. 6 is an elevation of the detail shown in Fig. 5 viewed from the left of Figs. 3 and 5, showing a further fragment of the bedstead. Fig. 7 is a fragmental sectional detail on line  $x^7-x^{10}$ , Fig. 7<sup>a</sup>, showing the inclined track and the brackets by which it is fastened to the bed-frame, and also a fragment of the front bracket and head support, omitting the bracket facing. Fig. 7<sup>a</sup> is a detail elevation from the right of Fig. 7. Fig. 8 is a view of the bed lowered to the position where the springs are at full tension and the head-supporting bracket chains are drawn taut, thus holding the bracket stationary to support the bed during its further downward movement, and while fully lowered. Dotted lines indicate the position of the bed when lowered with its legs resting on the floor; just before the final movement of drawing the bed fully out into the room by raising the head-board or by manipulation of the frame. Portions of the chains and springs are omitted to avoid confusion. Fig. 9 is a fragmental, sectional detail showing in solid lines the foot of the bed with the leg in the position in which it stands when it first touches the floor. Dotted lines indicate the position of parts when the head-board, not shown in this view, has been raised and the bed brought into position for use. Fig. 10 is



a sectional elevation of the bed on line  $x^7-x^{10}$ , Fig. 11, in the position finally assumed when the head-board is raised and the bed is in position for use. Fig. 11 is a view from the foot of the bed when the bed is in the position shown in Fig. 10. Fig. 12 is a sectional detail of the lower fastening of the curtain holder. Fig. 13 is a detail of one of the clips for holding the upper end of the curtain holder.

1 designates the wall, and 2 a recess therein in which the bed is to be stored when not in use.

3 is a bed-frame.

4 is a bracket-arm hinged to the floor at 5 and supported by a flexible connection as chain 6 which is connected to the bracket-arm at its free end and with the wall by a suitable support as lag-screw 7.

The parts just described afford a rigid support for the head of the bed when the bracket is extended, as shown in Figs. 8 and 11. Yielding means are provided for retracting the bracket into upright position when the bed is to be brought to rest in the recess 2. These means comprise springs 8, 9, fastened to a rigid link or bar 10 which is pivoted to the wall by suitable means as lag-screw 11.

The bar 10 is adapted to swing from a rear oblique position, as shown in Fig. 3, to an approximately upright position, as shown in Fig. 10. The rear spring 9 is fixed to the floor  $f$  as at 12, by one end, and to the upper free end of the bar 10 at its other end to normally hold the bar aslant rearward when the bed is in folded position. The front spring 8 is attached to the free end of the bar 10 by one end and is attached by its other end to the free end of the bracket-arm 4, and is arranged to normally retract the bracket-arm toward the bar 10. The bar 10 is pivoted near the pivot 5 of the bracket and extends to a point considerably above the level of the free end of the bracket 4 when said bracket is in its bed-supporting position shown in Figs. 8 and 10.

The springs 8 and 9 are arranged in pairs, a pair on each side of the bed, and the rear spring 9 is preferably stronger than the forward spring 8 so that the tension of spring 9 will stop the bar 10 before it is drawn out of the recess 2. Any other form of stop might be used if found desirable.

The bed-frame 3 is adjustably connected with the bracket 4 by an inclined track or way 13 on the lower side of the frame 3 and rollers 14 to run on said track, said rollers 14 being carried by lugs 15 which project upwardly and rearwardly from the bracket-arm 4, and said track being closed at its ends to limit the movement of the roller.

The bed is provided at the head of its frame 3 with a rigid upright 16 braced by a brace 17, and the upper portion 18 of the head of the bed is pivoted at 19 to the up-

right 16, and is pivotally connected by a fulcrum-link 20 with the free end of the bracket 4. The link 20 and its connections constitute automatic means to hold the upper portion of the headboard upright when the bed-frame is fully lowered and also when it is on end. Said link serves as a fulcrum for the upper folding portion or member 18 of the head of the bed so that when in the act of folding the bed, the folding portion 18 of the head of the bed is pulled forward from the position shown in Fig. 10 into the position shown in dotted lines in Fig. 8, the upright 16 and consequently the main body of the bed-frame 3 will be moved rearwardly relative to the bracket 4. This will be understood by comparison of the dotted position in Fig. 8 with the solid position in Fig. 10. The track 13 allows of change of position from that shown in Fig. 10 to that shown in dotted lines in Fig. 8; the inclination of said track serving to lift the head of the bed and retract the frame as the folding section 18 is drawn downward preparatory to tilting the bed into stored position shown in Fig. 1. This shifting of the bed frame brings the head of the bed further rearward from the fulcrum formed by the roller 14 so that it assists in lifting the foot of the bed in the further upward movement thereof.

21 is a facing for the bracket 4 to close the mouth of the recess 2 in front of the bracket when the bed is in its folded position. The same may be ornamented in any suitable manner. In the drawing it is shown constructed to represent a set of drawers. The portion of the recess above the bracket may be concealed in any appropriate manner. Portières or curtains may be arranged for this purpose as shown in the drawings.

For the purpose of closing the opening back of the head of the bed when the bed is lowered, a curtain may be mounted on the head board of the bed. The upper portion 18 of the head of the bed may be provided with a curtain-holder 22 in the form of a frame detachably secured by clips 23 and by a bent end 24 inserted into a hole 25 in the member 18 of the bed; the curtain 26 being secured to the top rail 27 of the frame and extending down to the bottom of the frame between the frame 22 and pivoted head member 18, so that when the member 18 is upright the curtain 26 will be upheld at the head of the bed to close the upper portion of the mouth of the recess 2.

28 designates legs for the foot of the bed. The same are jointed to the bed frame by a broken knuckle joint; being pivoted at their upper ends to studs 29 which project downward from the bed-frame. Said legs are connected together by a cross-piece 30 which is connected by a spring 31 with the bed-frame. Said spring is connected to the bed-



frame and to the outside of the leg at such point that when the leg comes to vertical position the spring will lie outside of the center of the pivot 32 by which the leg is pivoted to the bed frame, and will therefore operate to extend the leg outward beyond the foot of the bed in the position indicated in solid lines in Fig. 9. The spring, however, is not of sufficient strength or tension to support the leg in a horizontal position when the bed is tilted or up-ended, and allows the leg to droop and in fact pulls it into an inwardly slanting position as shown in solid lines in Fig. 8 whenever the foot of the bed is tilted up from the floor as indicated in said Fig. 8. The purpose of this construction is to allow the leg to fall by gravity to draw the spring inward past the pivot whereupon the spring will draw the leg into a position parallel with the frame of the bed when said frame is upright in the position shown in Fig. 3, thus to withdraw the leg into the recess 2 when said bed is stood on end.

As the bed moves from the solid to the dotted position in Fig. 8, the weight of the leg 28 will overcome the tension of the leg-throwing spring 31 until the leg has assumed a vertical position, whereupon the spring 31, being then outside of the pivot 32, will throw the leg outward into the dotted position shown in Fig. 8 and the solid position shown in Fig. 9.

The upright 16 of the head of the bed is of sufficient height to accommodate the bed-clothing between the pivotal point 19 and the mattress 33 and by reason of the operation of parts hereinbefore described, when the bed is stood in upright position, as shown in Fig. 3, the upper portion 18 with its curtain 26 will also be in upright position parallel with the frame of the bed.

34 designates clips on the foot-board or frame 5 of the bed-frame for suspending the bed-clothes from said foot-board. These clips are in the form of spring rods extending across between the side standards 36 of the foot-board and resiliently engaging the uprights 37 of said foot-board. The side standards 37 are preferably tubular and are provided on their adjacent sides with holes 38 into which the ends of the spring rods 34 may be inserted when the rods are sprung for that purpose. The tension of said rods is sufficient when the same are thus held in the side standards, to cause the same to grip the several articles of bed-covering when the ends of the same are appropriately inserted between the rods and the uprights 37, thus to support the bed-clothing articles spaced apart for airing when the bed is in the upright position shown in Fig. 3.

39 designates a roller at the top of the upright 16 at each side of the bed to form an anti-friction support for the head of the bed when the same is up-ended, as shown in Fig. 3.

40 designates portières for concealing the bed when the same is stored away.

The track 13 is formed of two track rails, one on each side of the bed, and a roller 14 is provided on each side of the bracket, one for each track rail. The track rails are bent to form loops 41 and 42, one at each end, and with an open space 43 between said loops through which the rollers may be inserted and withdrawn in the operation of mounting and unmounting the bed.

The operation of bringing the bed into and out of position for use may be understood from the drawings. Assuming the bed to be in upright position, as shown in Figs. 1 and 3, the operation of lowering the bed is as follows:—First, the portière curtains 40 may be drawn aside and then the frame of the bed will be taken hold of and pulled forward into the dotted position shown in Fig. 3. The lower corner of the head of bed-frame 3 can move forward for some distance, as will be seen by the dotted lines at the bottom of Fig. 3; and when the bed is in upright position as shown in Fig. 3, it will be supported on each side at two points only; namely, by the roller 39 on the floor, and by the then upper and outer closed ends of the track 13 resting on the rollers 14 of the upright bracket 4. Therefore, when the bed is standing upright, and while it is being drawn outward from the solid position in Fig. 3, to the dotted position in said figure, it is sustained and carried by the practically upright bracket 4 and the roller 39 until the tilting of the bed has lifted the roller 39 clear from the floor; which occurs as the foot of the bed moves forward from the dotted position shown in Fig. 3. As the operation of lowering the bed continues the bed and bracket swing forward and downward from their upright position shown in Fig. 3, and as this occurs the spring 8 is brought into tension, thus drawing the free end of the bar 10 upward and forward toward the front of the recess; and in the meantime the spring 9 restrains the bar 10, and the tension of both springs 8 and 9 is thus exerted to sustain the weight of the bed and bracket as the bed is further lowered. It will be noted from Figs. 8 and 10 that when the bracket is in the fully-lowered position, each of said springs 8 and 9 is in tension, and that the tension of the spring 8 is exerted in an upward direction to draw the free end of the bracket upward and backward; and by comparison with Fig. 3 it will be noted that when the tension of the spring is exerted, it is exerted in an effective manner to retract the bracket. This is effected by the use of the pivoted bar 10 which also makes provision for the use of a longer spring than could otherwise be applied for this purpose in the same depth of recess or with the same efficiency. The bars 10 operate to rapidly increase the tension of



the springs 8 and 9 as the bar comes to vertical position and as the bed frame lowers. An object of this contrivance or arrangement of bars and springs, is to provide means whereby the tension of the spring, will be exerted most effectively during the full tilting movement of the bed, and to accomplish this with comparatively small and inexpensive springs and without causing any very undesirable variation of the tension of the springs. When the bed has been lowered into the position shown in solid lines in Fig. 8, a further movement of the same will tilt the bed on the fulcrum formed by the roller 14 in the track 13 until the bed comes to the approximately level position shown in dotted lines in Fig. 8.

By reference to Fig. 8, it will be seen that when the bed is lowered to the position there shown in dotted lines the frame of the bed slants downward from head to foot, and that the head member 18 is still in position parallel with the frame of the bed. The operation of finally bringing the bed into position for use, may be performed now by pulling the bed forward, that is, outward or footward, thus drawing the track 13 forward on the roller 14, and that thereupon the head of the bed lowers and the link 20 held by its pivot at 14 reacts upon the pivoted upper portion 18 of the head of the bed to hold the same from moving forward correspondingly with the joint at 19, thus to bring the portions 18 and 22 into upright position, shown in Fig. 10. At the same time the feet of the legs 28 remain approximately at the same point on the floor, and the legs swing up and over said point, and the foot of the bed rides over on the leg 28, until the leg stands aslant, leaning away from the recess, as indicated in Fig. 10, so that the force of gravity will thereafter tend to draw the bed away from the mouth of the recess, so long as the bed is in the position for use into which it is thus brought.

Whenever the bracket 2 has been lowered to bring the rollers 14 to the elevation at which they are to stand to support the bed in lowered position, the chain 6, as before stated, prevents any further forward or lowering movement of the bracket 4, and the bracket is thus held in solid and stable position. When this occurs the bed is nearly lowered to position for use and the portion 18 of the head of the bed may then serve as a lever by the operation of which the bed may be brought to level position more easily than by pulling the bed outward as just above described; that is to say, by bringing the pivoted portion 18 into upright position manually, the leverage thereof is exerted to force the bed forward and bring it into the level position shown in Fig. 10.

When the bed is in its fully lowered position, the attendant may bring it into its upright stored position by first pushing the bed toward the recess, thus moving the track 13 rearwardly on the rollers 14 and thereby elevating the head of the bed somewhat above the level of the foot. At the same time the link 20 prevents any like rearward movement of the upper portions 18 and 22 and therefore the same are swung downward into position parallel with the bed frame. Instead of pushing on the bed to bring it to this position from its fully lowered position, the attendant may draw down and forward the upper portions or members 22 and 18 and thus use the same as a lever to move the bed frame toward the recess, and to raise the head thereof into the position shown in dotted lines in Fig. 8. From this position the bed may be pushed upward into the standing position shown in dotted lines in Fig. 3, and then may be pushed back into the recess in the position shown in solid lines in Fig. 3.

What I claim is:—

1. A bed frame, a bracket-arm hinged to the floor, an inclined way secured to the bed-frame; a pivot at the end of the bracket and traveling in said way, the ends of the way being adapted to limit the travel of the bracket; and a flexible connection between the swinging end of the bracket and the wall to limit the downward swing of the bracket.
2. A bed provided with a track, a bracket pivoted at its lower end and provided with a pivot to run on said track, a support, and a flexible connection between the bracket and the support.
3. A bed-frame, a pivoted bracket pivotally and slidingly connected with the frame, a pivoted bar, flexible means to support the bracket aslant, a spring connecting the free end of the bar with the free end of the bracket, and a spring to retract the bar.
4. A pivoted bracket provided with a facing, flexible means to support the bracket aslant, a bed-frame pivotally and slidingly mounted on the free end of the bracket and having a limited sliding movement thereon, spring means to retract the bracket from slanting to upright position, and means to automatically abnormally increase the tension of said spring means as the bed approaches recumbent position.
5. A pivoted bed-frame, a bracket hinged to the floor, a way fixed upon the frame, a pivot carried by the bracket and sliding in the way, the ends of the way limiting the travel of the pivot; a bar pivotally connected to the wall at its lower end, a coil spring connecting the swinging end of the bar to the swinging end of the bracket, and a second coil-spring connecting the swinging end of the bar to the floor, so that the tension of the



springs assist in counterbalancing the bed and so that the tension of the springs increases as the bed lowers.

6. In a wall bed, a bracket and a bar pivoted near the same point, a spring to draw the free ends of the bracket and bar toward each other, and a spring to retract the free end of the bar from the free end of the bracket.

7. A bed-frame slidably mounted on a pivot and having a limited movement thereon, a head for the frame having a pivoted upper portion, and a link connecting such upper portion with the pivot thereby to raise and lower said upper portion as the frame slides to and fro on said pivot.

8. A bed-frame pivotally and slidably mounted to be movable toward and from a recessed body and provided at its head with an upright, a roller at the top of the upright, a pivoted portion connected to the upright, and spring-controlled means to automatically lower and raise the pivoted portion as the frame slides to and fro.

9. A bed-frame slidably mounted on a pivot, an upright on said frame, a member pivoted to said upright, and a link connecting the pivoted member with the bed frame pivot whereby the movement of the pivoted member will operate to slide the bed-frame on its pivot.

10. A recessed body, a bracket pivoted at the bottom of the recess and provided with means to conceal the lower portion of the recess, spring means to retract the bracket to upright position, a flexible connection to support the bracket aslant, and a bed-frame having a way by which the bed-frame is pivoted to the bracket and adapted to be stored in the recess.

11. A bed frame provided at one end with an upright, a roller on said upright, and a pivoted support for the bed frame to act in conjunction with said roller to support and carry the frame when the bed is on end.

12. A bed frame provided with a jointed head board, a roller at the joint of the head board and a pivoted bracket pivoted to the bed frame to assist in carrying and supporting the same.

13. A recessed body and a bed frame pivotally and slidably mounted in the recess and provided with a foldable head board and means pivotally connecting the bed-frame and head-board to automatically fold and unfold the head-board and to carry the same into and out of the recess of said body as the bed-frame is raised and lowered so that the head board assumes an upright position when the bed frame is pulled out of the recess.

14. A recessed body, a bracket having a facing to close the lower portion of the recess opening when the bed is stored, a bed frame

having a foldable head-board to close the upper portion of the recess opening when the bed is lowered, and automatic means to raise and uphold the head board as and when the bed is lowered and pulled out of the recess.

15. A recessed body, a bed-frame pivotally mounted to swing from a horizontal to a vertical position and slidably mounted to be pulled out of the recess, a swinging leg at the foot of the bed-frame, and a spring to swing the leg forwardly into a slanting position so that when the bed is moved downwardly and the leg contacts with the floor the bed may be pulled out of the recess without moving the leg upon the floor, said leg swinging to an upright position.

16. A recessed body, a bed-frame pivotally and slidably mounted in the recess, a leg carried by the foot of the bed-frame, said leg having a limited amount of swinging motion; a spring to swing the leg outwardly so that when the bed is lowered the leg will assume a slanting position and so that when the bed is pulled out of the recess the leg will assume a vertical position without sliding on the floor.

17. A bed frame, a slanting track on the underside thereof near one end, a bracket pivoted at its lower end and provided with roller means at its upper end, the same being in the track, a jointed head-board at said end of the frame, the same being provided with roller means at the joint, means to support the other end of the bed frame when fully lowered, a link connecting the upper portion of said head board with the bracket, a bar pivoted near the pivot of the bracket, a spring to retract the bar and a spring to draw the free ends of the bracket and bar toward each other.

18. The combination of a pivoted bracket, a bar pivoted near the pivot of the bracket, a bed-frame pivoted to the outer end of the bracket, and two springs connecting the free end of the bar with the free end of the bracket, the rear spring being stronger than the forward spring.

19. A recessed body, a bed-frame pivotally and slidably mounted in the recess, a leg pivoted to the foot of the bed with a broken knuckle-joint and a spring connecting the leg to the bed-frame and adapted to swing past the pivotal point so as to draw the leg outward when the bed is lowered so that the leg will strike the floor in a slanting position and so that the bed may be pulled out of the recess without sliding the leg upon the floor, said leg assuming a vertical position.

20. A bracket pivoted at its lower end to swing forwardly from a vertical position, a flexible connection for limiting the forward swing of the bracket, a bed-frame, a way se-



cured to the bed-frame and slanting downward toward the foot of the frame, a roller carried by the bracket and operating in said way so that the bed-frame may be pulled forwardly when lowered.

21. In a wall bed, a bracket pivoted at its lower end and adapted to swing forwardly from a vertical position, a roller carried by the upper end of the bracket, a bed-frame  
10 having a way in which said roller operates,

said way being closed at its ends and open on its lower side between the ends.

In testimony whereof, I have hereunto set my hand at Los Angeles California this 9th day of April 1907.

WILLARD C. JAMES.

In presence of—

JAMES R. TOWNSEND,  
JULIA TOWNSEND.