

No. 800,911.

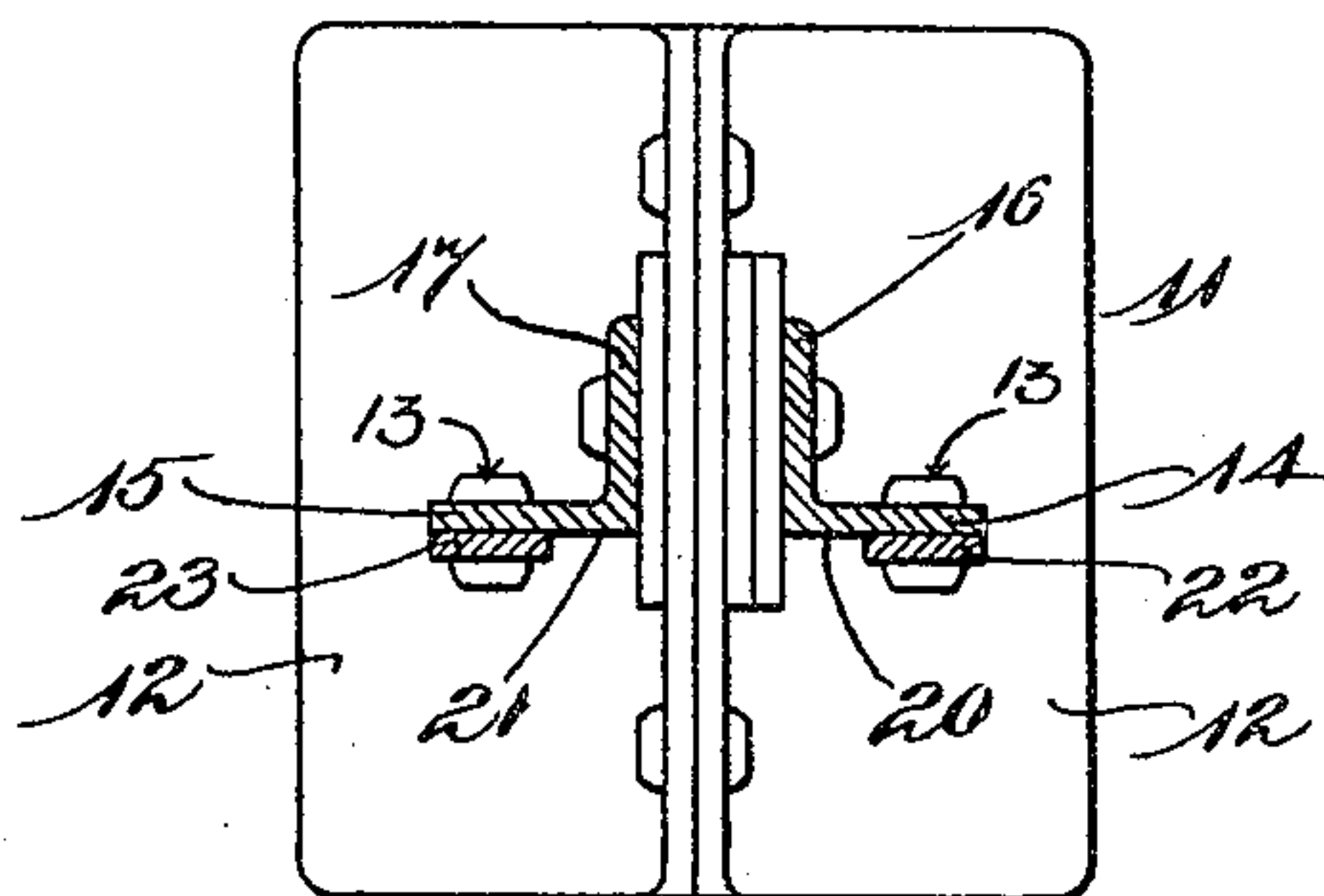
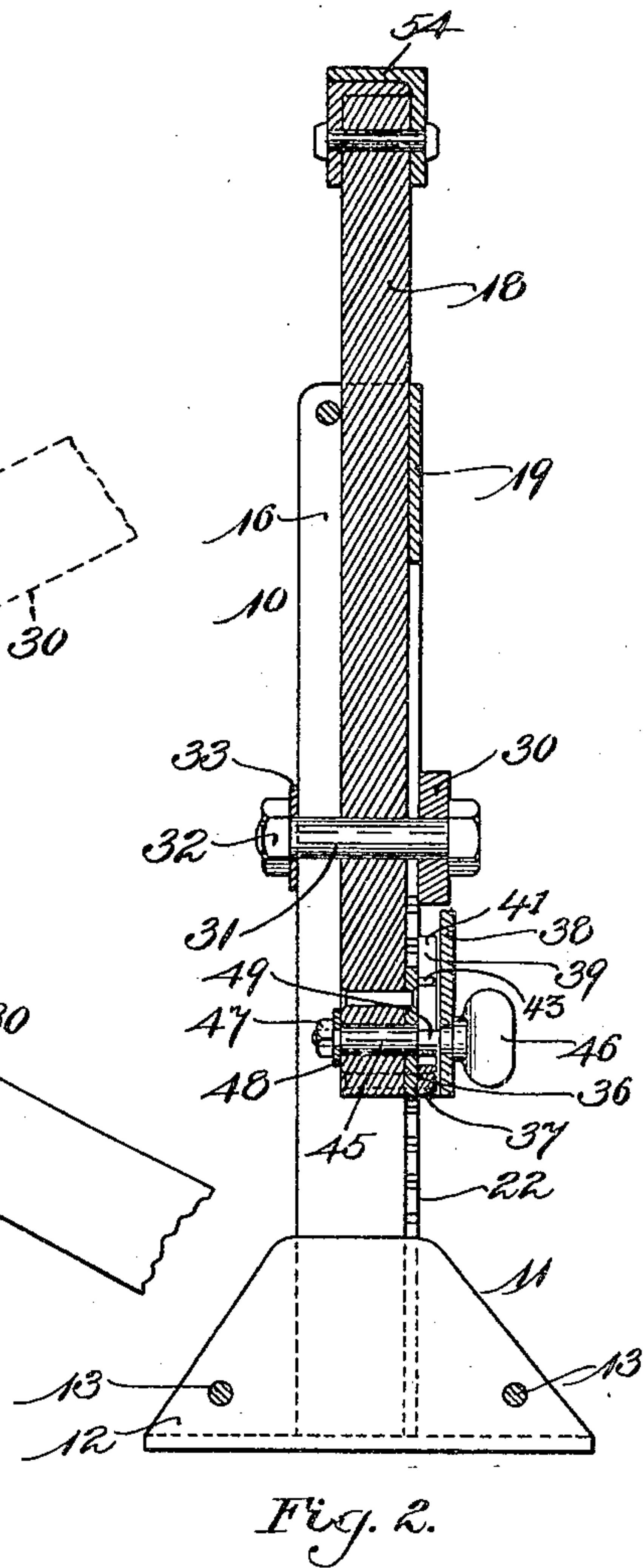
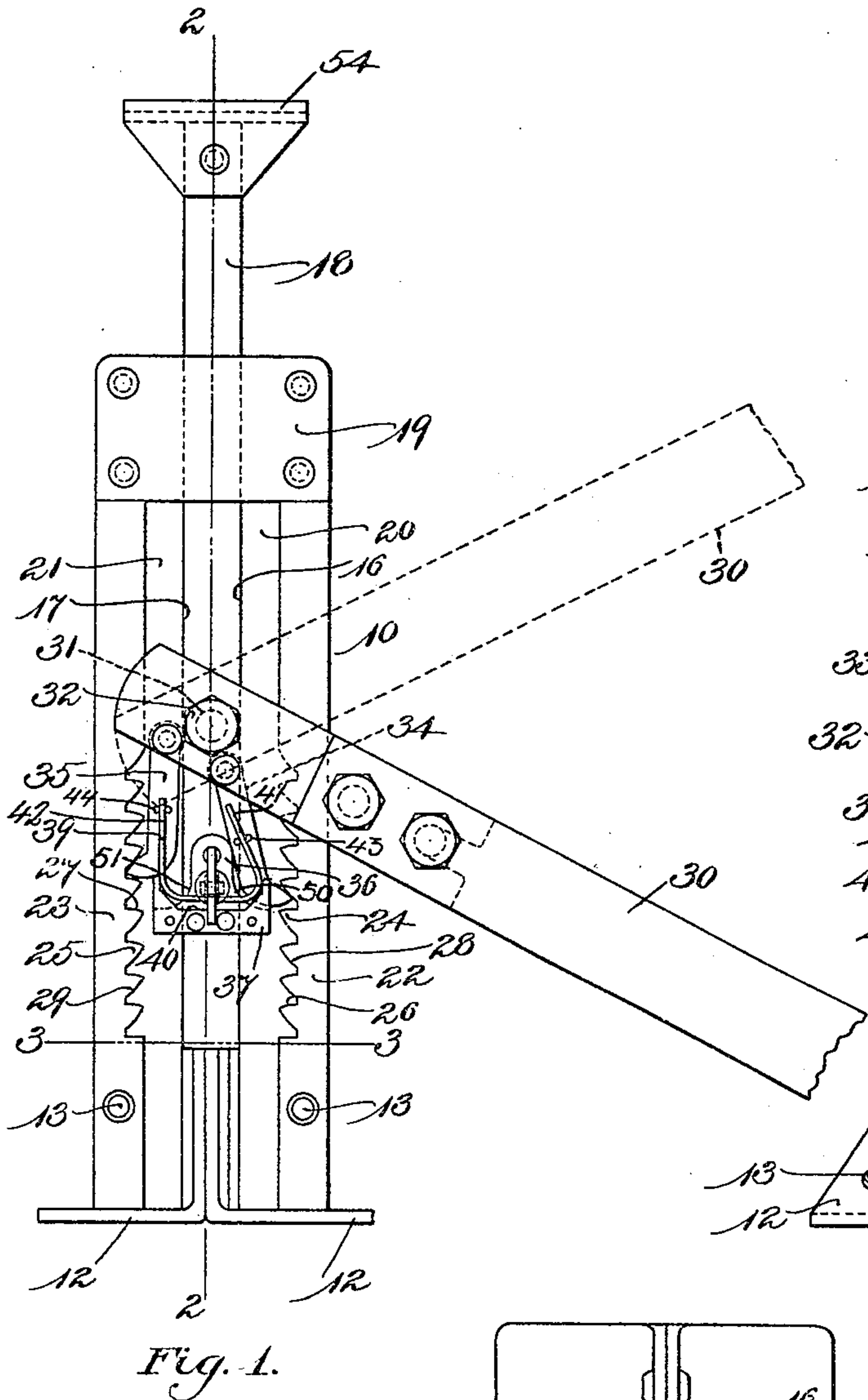
PATENTED OCT. 3, 1905.

J. A. FROSSARD.

DEVICE FOR IMPARTING RECIPROCATORY MOTION TO SLIDES.

APPLICATION FILED DEC 9, 1904.

2 SHEETS—SHEET 1.



Witnesses:
Franklin E. Low.
Sydney C. Taft.

Inventor:
John A. Frossard.
by his Attorney
Charles S. Gooding.

No. 800,911.

PATENTED OCT. 3, 1905.

J. A. FROSSARD.

DEVICE FOR IMPARTING RECIPROCATORY MOTION TO SLIDES.

APPLICATION FILED DEC. 9, 1904.

2 SHEETS—SHEET 2.

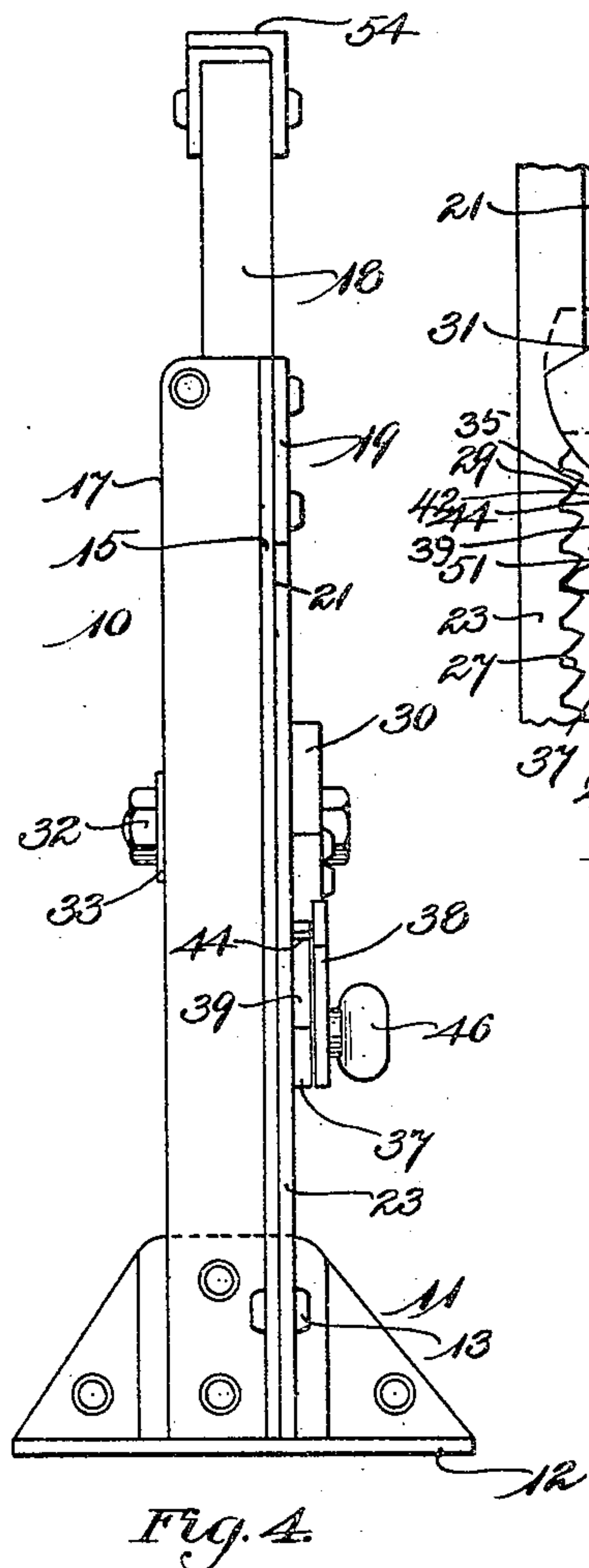


Fig. 4.

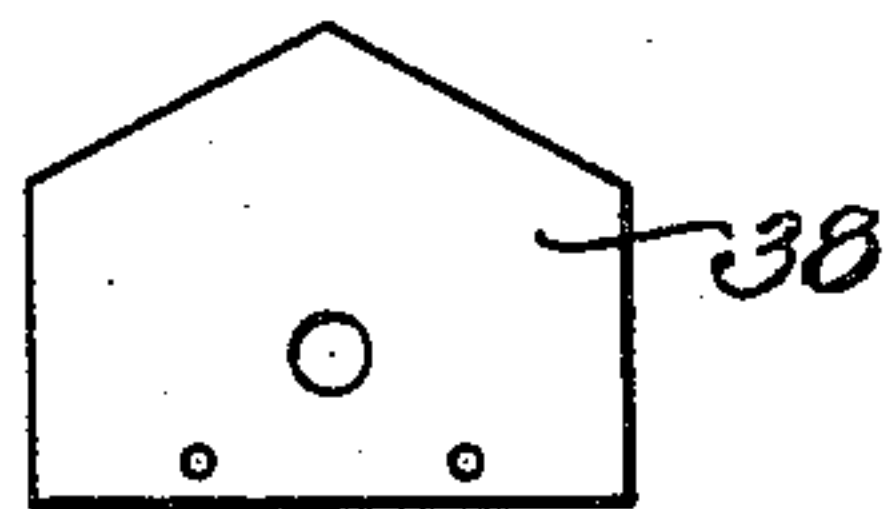


Fig. 8.

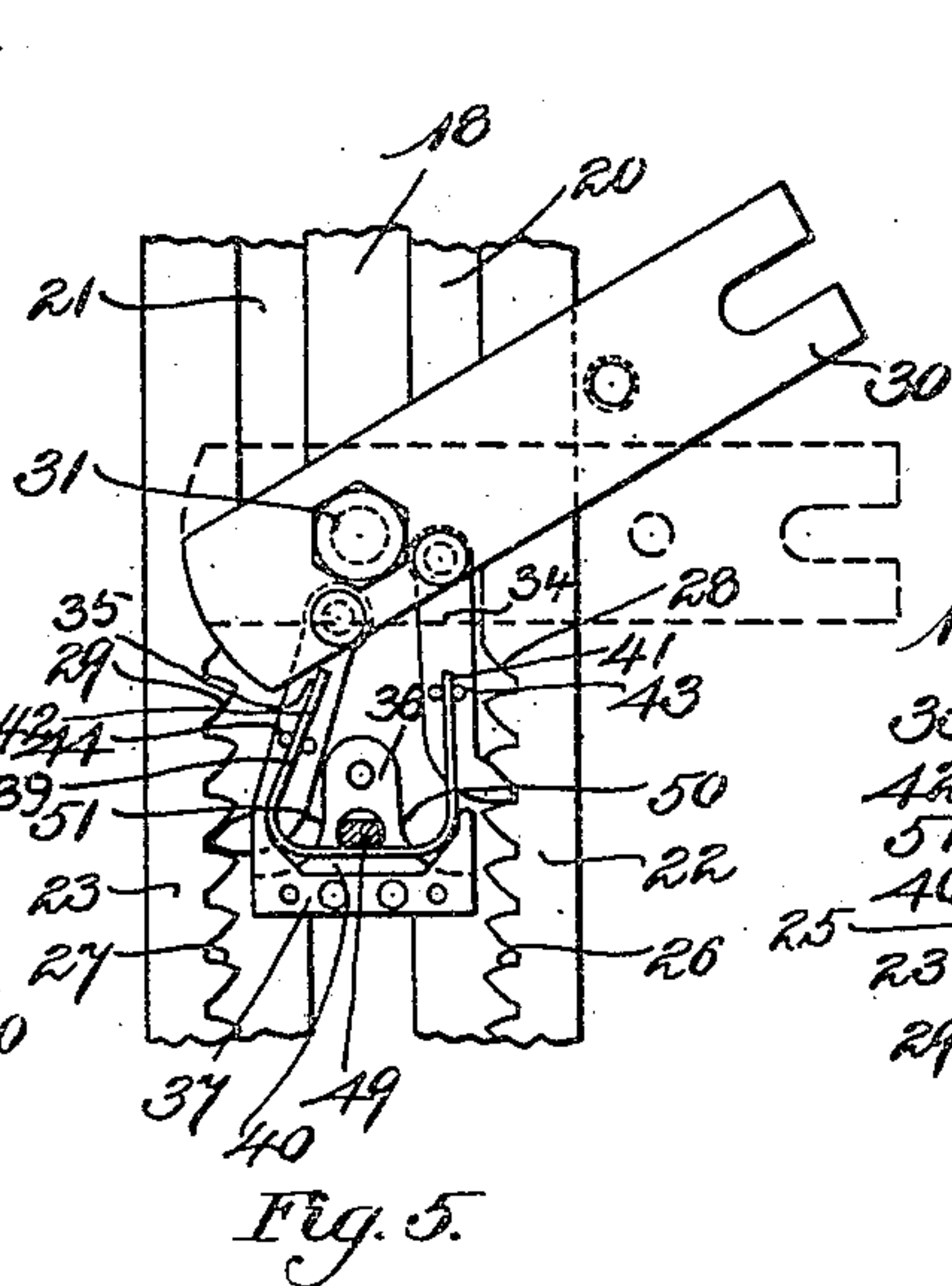


Fig. 5.

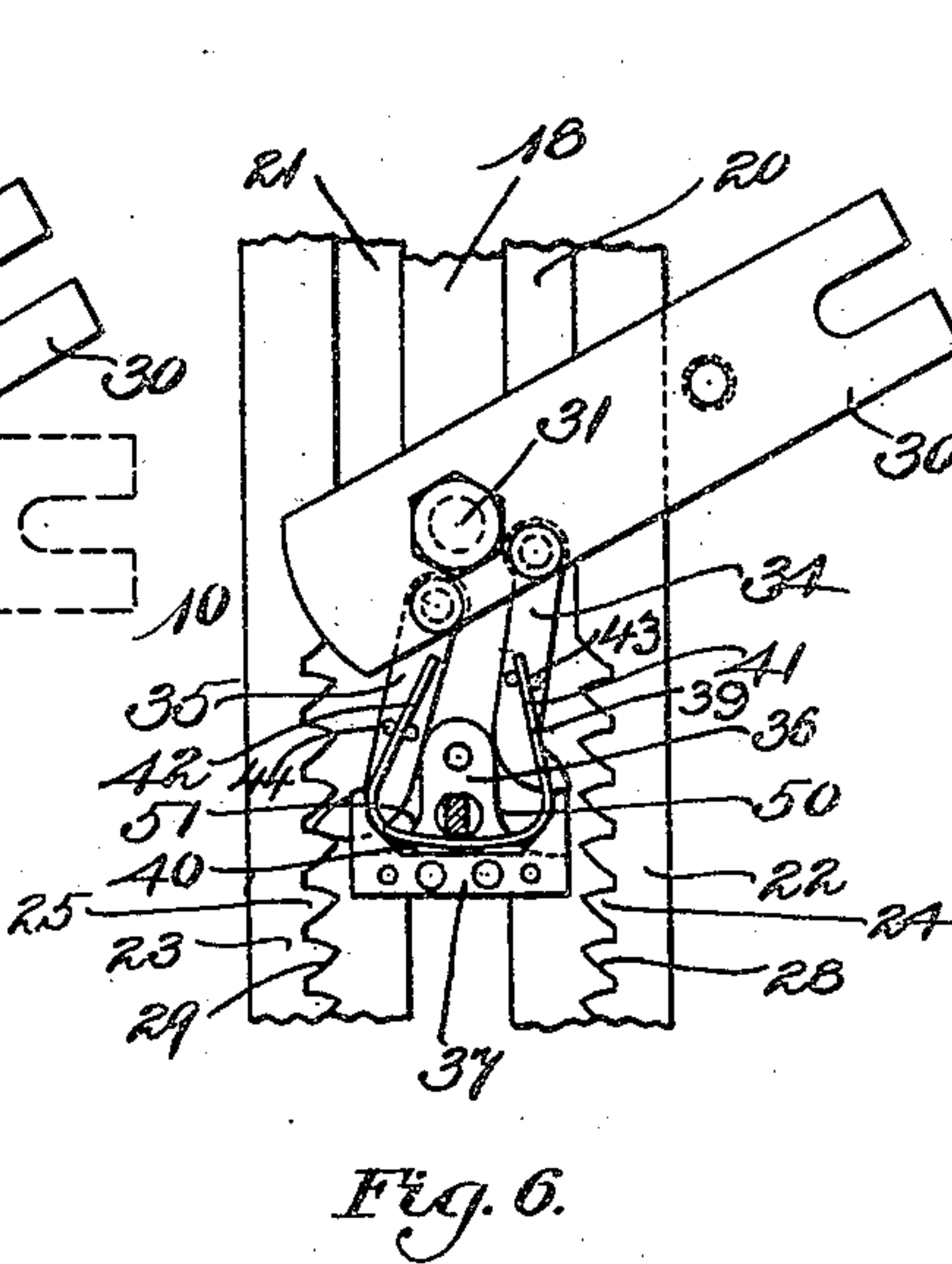


Fig. 6.

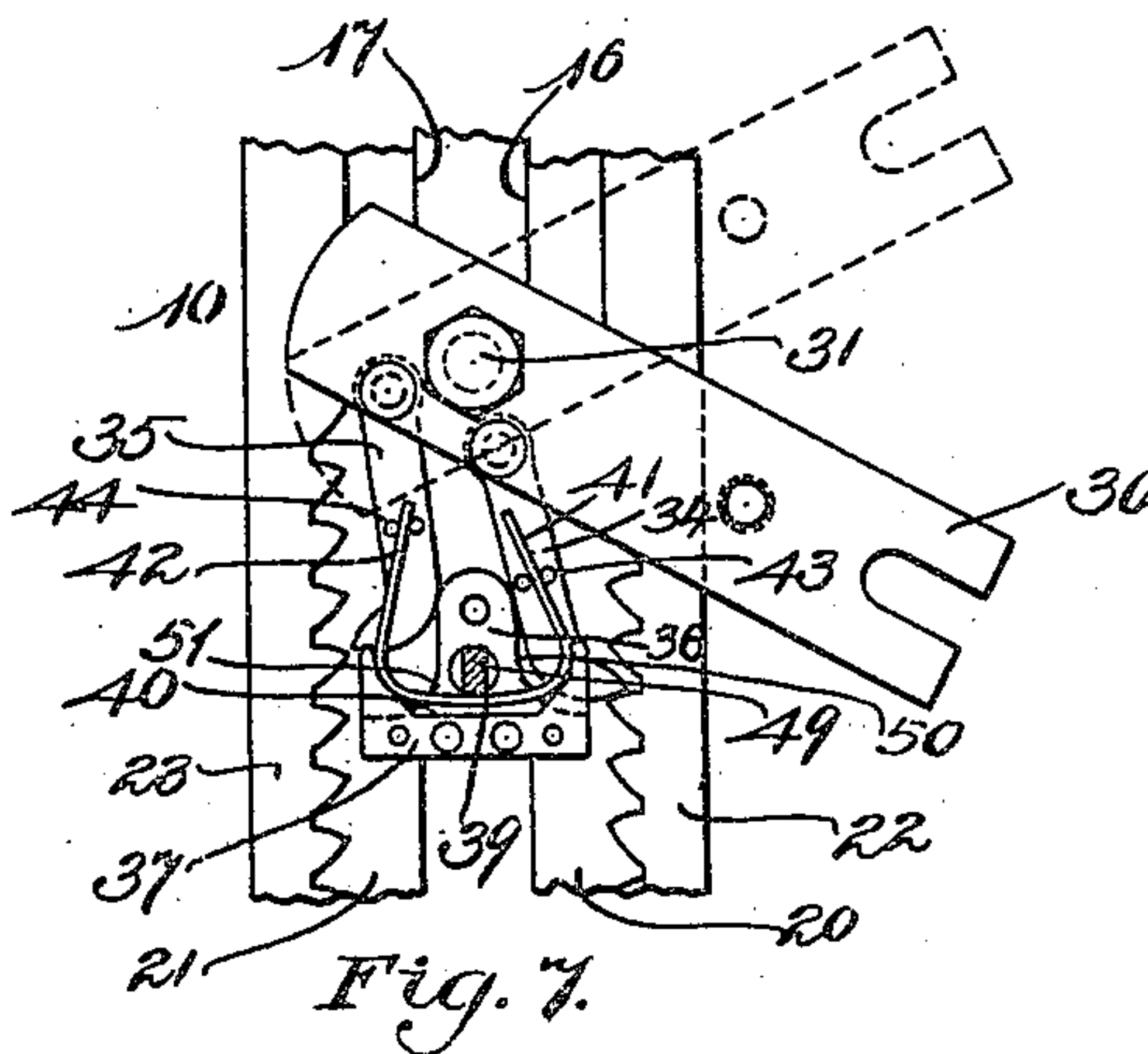


Fig. 7.

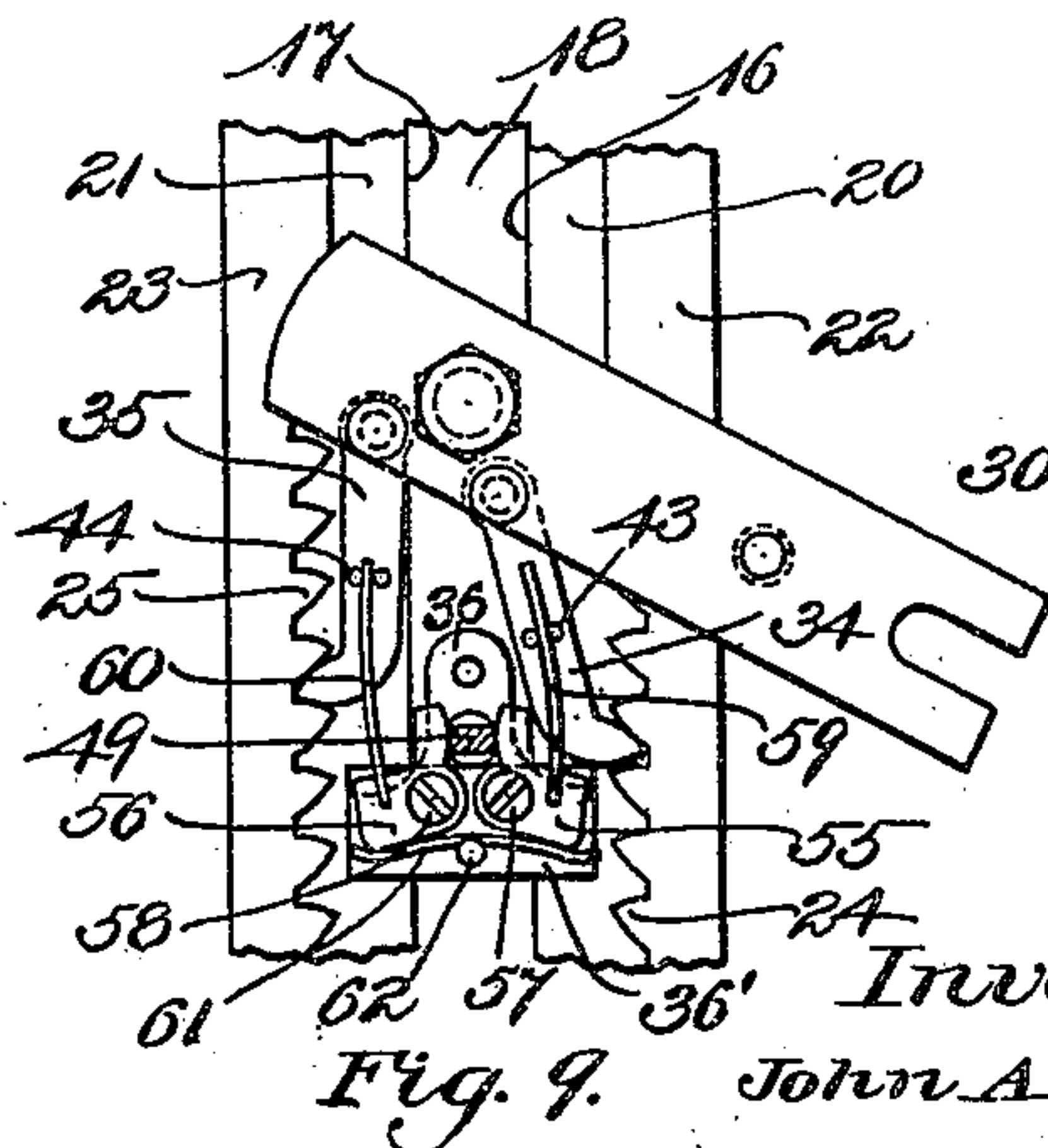


Fig. 9.

Witnesses:

Franklin E. Low.

Sydney C. Taft.

Inventor:

John A. Frossard.

by his Attorney

Charles S. Gooding

UNITED STATES PATENT OFFICE.

JOHN A. FROSSARD, OF EAST PEPPERELL, MASSACHUSETTS.

DEVICE FOR IMPARTING RECIPROCATORY MOTION TO SLIDES.

No. 800,911.

Specification of Letters Patent.

Patented Oct. 3, 1905.

Application filed December 9, 1904. Serial No. 236,161.

To all whom it may concern:

Be it known that I, JOHN A. FROSSARD, a citizen of the United States, residing at East Pepperell, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Devices for Imparting Reciprocatory Motion to Slides, of which the following is a specification.

This invention relates to an improved device for imparting reciprocatory motion to a slide by means of a lever pivoted to said slide.

The invention is particularly adapted to jacks for raising vehicles and the like.

The object of the invention is to provide a simple, strong, and easily-operated device which while being compact and simple in its construction is capable of lifting heavy weights with the expenditure of a small amount of power.

The invention consists, in a device of the character described, of a slide, a lever pivoted to said slide, two stationary racks, and two pawls pivoted to said lever, each of said pawls adapted to engage, respectively, one of said racks.

The invention further consists in the combination of parts hereinbefore set forth, together with a spring which normally acts to hold the pawls in engagement with said racks; and, further, the invention consists in the combination of elements recited and means acting upon said spring whereby said pawls are held out of engagement with said racks, together with guides supported upon said slide adapted to engage and guide said pawls into engagement with said racks.

The invention finally consists in the combination and arrangement of parts set forth in the following specification, and particularly pointed out in the claims thereof.

Referring to the drawings, Figure 1 is a front elevation of my invention as applied to a jack particularly adapted for raising vehicles with the cover-plate removed. Fig. 2 is a sectional elevation taken on line 2 2 of Fig. 1 with the cover-plate in position. Fig. 3 is a sectional plan taken on line 3 3 of Fig. 2. Fig. 4 is a side elevation of my improved jack as viewed from the left of Fig. 1 with the cover-plate in position. Figs. 5, 6, and 7 are detail views illustrating the operation of the device, particularly in reference to the action of the pawls, the lever to which they are pivoted, and the racks which they re-

spectively engage, the cover-plate being removed in said views. Fig. 8 is a detail view of a cover-plate by means of which certain portions of the mechanism are protected. Fig. 9 is a front view of a modified form of pawl-actuating mechanism.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 10 is a frame consisting of a base 11, formed of two angle-irons 12 12, fastened together by rivets 13 13. Two angle-irons 14 and 15 are fastened to the base 11 by rivets and extend longitudinally at right angles therefrom, the sides 16 and 17 of said angle-irons 14 and 15 being parallel to each other and forming ways to guide a slide 18, interposed therebetween. The upper ends of the angle-irons 14 15 are joined together by a plate 19, riveted to the front sides 20 and 21 of said angle-irons. Two stationary racks 22 and 23 are located upon opposite sides, respectively, of said slide and are fastened, respectively, to the front sides 20 and 21 of said angle-irons 14 and 15.

The teeth 24 and 25 of the racks 22 and 23 have their front or upper edges 26 and 27 substantially horizontal, while the back edges 28 and 29, respectively, of said teeth are inclined at opposite angles, respectively, to said slide 18.

A lever 30 is pivoted to a stud 31, fast to the slide 18, said stud 31 extending through said slide and being provided with a nut 32 and washer 33 upon the back end thereof, said washer making contact with the rear edges of the sides 16 and 17 of the angle-irons 14 and 15. Two pawls 34 and 35 are pivoted to the lever 30 upon opposite sides, respectively, of a plane extending longitudinally of said slide and through the median pivotal line of said lever 30 and said stud 31. Each of said pawls is adapted to engage, respectively, one of said racks, the pawl 34 being adapted to engage the rack 22 and the pawl 35 to engage the rack 23.

To the front end of the slide 18 is attached a guide-plate 36, and to the front of said guide-plate is attached a spring supporting-plate 37, and in front of the pawls 34 and 35 extends a cover-plate 38, also fast to the slide 18, so that, in effect, said cover-plate, spring supporting-plate, and guide-plate being rigidly fastened to the slide 18 move and act as though formed integral therewith.

A U-shaped spring 39 rests upon the spring supporting-plate 37 above a recess 40, formed in the upper edge of said spring supporting-plate. The free ends 41 and 42 of said spring
 5 each extend, respectively, between the legs of two staples 43 43 and 44 44, which project from the front face of the pawls 34 and 35, respectively. It will be understood that the free ends of said spring are free to slide be-
 10 tween the legs of the staples 43 43 and 44 44 when the pawls 34 and 35 rock upon their pivots and are raised and lowered with relation to the slide 18 by the rocking of the lever 30, as hereinafter described.

15 Immediately above the central portion of the U-shaped spring 39 is a rotatable key 45, which extends through the cover-plate 38 and is journaled to rotate in the slide 18, being held against longitudinal movement
 20 therein by a handle 46 at one end thereof and by a nut and washer 47 and 48, respectively, at the opposite end thereof. The portion 49 of said key, located between the cover-plate 38 and slide 18, is made rectangular in shape
 25 and is of greater length measured transversely thereof in one direction than in a direction at right angles thereto. Said rectangular portion rests against the upper face of the central portion of the U-shaped spring 39, and
 30 by rotating said key 45 by means of the handle 46 from the position illustrated in Fig. 1 to a position at right angles thereto the central portion of the U-shaped spring 39 will be forced downwardly into the recess 40, thus
 35 drawing the free ends 41 and 42 toward each other and acting to hold the backs of the pawls 34 and 35 in contact with the cam-shaped guide edges 50 and 51, respectively, of the guide-plate 36, as illustrated in Figs. 6
 40 and 7. It will be understood, therefore, that when the key 45 is in the position illustrated in Fig. 1 the pawls will be held by the spring 39 in engagement with the teeth of their respective racks; but when the key is turned
 45 at right angles to the position illustrated in Fig. 1 the pawls will be held by the spring in engagement with the opposite edges, respectively, of the cam-shaped guide-plate 36. Assuming now that the key 45 is in the position
 50 illustrated in Fig. 1 and the pawls 34 and 35 in engagement with the teeth of the racks 22 and 23, respectively, if the lever 30 is rocked upon its pivot 31 from the position shown in full lines in said figure to that shown in dotted
 55 lines the pawl 34 will be raised from the tooth with which it is in engagement to the tooth located next above. Upon rocking the lever 30 in the opposite direction to that before described or downwardly from the po-
 60 sition shown in dotted lines to that shown in full lines, Fig. 1, the pawl 35 will be raised to the next tooth above that in which it is shown as located in said Fig. 1, and so on. As the lever 30 is rocked the pawls will al-
 65 ternately be raised one tooth at a time upon

their respective racks, and the slide upon which the lever and pawls are supported will move upwardly.

The raising power obtained by the device is very great on account of the fact that as
 70 the pivot of the pawl passes beneath the pivot of the lever it forms substantially a toggle in its mechanical effect. To reverse the upward motion of the slide and move the
 75 same downwardly, the key 45, as hereinbefore described, is turned at right angles to the position shown in Fig. 1 to the position shown in Fig. 7, and the spring 39 will then
 80 act constantly to hold the pawls out of engagement with their respective racks and in en- gage- ment with the cam-shaped faces of the guide-plate 36, so that upon rocking the lever
 30 the pawls will alternately descend tooth by tooth upon their respective racks, as illus-
 85 trated in Figs. 6 and 7. For instance, if the lever 30 is rocked upwardly from the position shown in Fig. 7 in full lines to that shown in dotted lines in said figure the pawl 35 will
 90 move downwardly to the next lower tooth upon the rack 23, or to the position illustrated in Fig. 6, and upon subsequently moving the lever 30 downwardly the pawl 34
 95 will move downwardly into the next tooth below in its respective rack. As the pawls move downwardly, as hereinbefore described, the lever and the slide 18, upon which said
 100 lever and pawls are supported, will move downwardly therewith. In this last - described downward movement of the slide, lever, and pawls it will be understood that the
 105 spring 39 is holding the pawls normally out of engagement with their respective racks, and as the lever is rocked the back edges of the pawls 34 and 35 come into contact alter- nately with the guide-edges 50 and 51 of the
 110 guide-plate 36 and are thus forced by said guide edges and by the rocking of the lever 30, to which said pawls are pivoted, alternately into engagement with the teeth of their respective racks, so that step by step
 115 said pawls move downwardly upon their respective racks, together with the slide 18 and the lever 30, to which they are pivoted. If it is desired to move the slide upwardly or downwardly a considerable distance without
 120 using the step-by-step motion of the pawls and lever hereinbefore described, it may be accomplished by placing the lever in the position shown in dotted lines in Fig. 5, where-
 125 upon the pawls being half-way between their extreme positions will just clear the teeth of their respective racks, and the slide 18, together with the lever 30 and pawls supported thereon, may be moved upwardly or down-
 wardly to any extent desired until the top
 130 plate 54 of the slide 18 is brought into engagement or out of engagement with, respectively, the vehicle or other object which it is desired to raise or lower.

The manner of operation of my improved 130

device is as follows: Assuming the parts to be in the position illustrated in Fig. 1 and that it is desired to raise the slide 18 until the top plate 54 contacts with the piece to be raised, the lever 30 is set in the position illustrated in dotted lines, Fig. 5. The slide 18 is then raised until the top plate 54 contacts with the piece to be raised. The lever 30 is then moved upwardly to the position illustrated in Fig. 5 and downwardly to the position illustrated in Fig. 1 alternately until the slide 18 is moved upwardly to the desired extent. When it is desired to lower the vehicle, the key 45 is turned from the position illustrated in Fig. 1 to that illustrated in Fig. 7, the lever is rocked upon its pivot, as hereinbefore described, and the pawls descending upon their respective racks step by step the slide 18 descends, together with the top plate, until the vehicle, resting upon said top plate, rests upon the ground, whereupon, by rocking the lever a few times, the top plate 54 will move out of contact with the vehicle and the jack may be removed.

In Fig. 9 I have illustrated a modified form of my invention in which all of the parts are the same as in the form hereinbefore described, except that instead of using a single U-shaped spring the free ends of which engage directly with the staples of the pawls two levers 55 and 56 are pivoted at 57 and 58, respectively, to the guide-plate 36', each of said levers being provided with a flat spring 59 and 60, respectively, which engage the staples 43 and 44. A third flat spring 61 extends across the guide-plate 36' and bears against the under sides of the levers 55 and 56, said spring 61 being supported upon a pin 62, which projects forwardly from said guide-plate. The vertical arms of the levers 55 and 56 are held by the spring 61 in contact with the key 45, and the action of the springs 59 and 60 corresponds exactly with the action of the free ends 41 and 42 when the key 45 is rotated—that is, when the key is in the position illustrated in the drawings, the springs act to hold the pawls in contact with their respective racks, and when it is turned at right angles to said position the springs act to hold said pawls out of contact with their respective racks, and the guide-plate acts to force the pawls into contact with said racks when the lever 30 is rocked, as hereinbefore described.

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

1. In a device of the character described, a slide, a lever pivoted to said slide, two stationary racks, two pawls pivoted to said lever, each of said pawls adapted to engage, respectively, one of said racks, a spring to hold said pawls out of engagement with said

racks, and guides supported upon said slide and adapted to guide said pawls into engagement with said racks.

2. In a device of the character described, a slide, a lever pivoted to said slide, two stationary racks, two pawls pivoted to said lever, each of said pawls adapted to engage, respectively, one of said racks, a U-shaped spring, the free ends of said spring each engaging, respectively, one of said pawls, and means to force said free ends away from each other, whereby said pawls are held in engagement with said racks.

3. In a device of the character described, a slide, a lever pivoted to said slide, two stationary racks, two pawls pivoted to said lever, each of said pawls adapted to engage, respectively, one of said racks, a U-shaped spring, the free ends of said spring each engaging, respectively, one of said pawls, and means to force said free ends toward each other, whereby said pawls are held out of engagement with said racks, and guides supported upon said slide and adapted to guide said pawls into engagement with said racks.

4. In a device of the character described, a slide, a lever pivoted to said slide, two stationary racks, two pawls pivoted to said lever, each of said pawls adapted to engage, respectively, one of said racks, a spring to hold said pawls out of engagement with said racks, guides supported upon said slide and adapted to guide said pawls into engagement with said racks, and a key rotatably supported upon said slide, adapted by rotation to engage said spring and force said free ends away from each other, whereby said pawls are held in engagement with said racks.

5. A jack comprising a frame consisting of a base and two angle-irons fast thereto and extending longitudinally at right angles therefrom, two sides of said angle-irons parallel to each other and forming ways, a slide movable longitudinally in said ways, and means to impart a reciprocatory motion to said slide.

6. A jack comprising a frame consisting of a base and two angle-irons fast thereto and extending longitudinally at right angles therefrom, the sides of said angle-irons parallel to each other and forming ways, a slide movable longitudinally in said ways, a lever pivoted to said slide, two stationary racks fast to the sides of said angle-irons, and two pawls pivoted to said lever, each of said pawls adapted to engage, respectively, one of said racks.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN A. FROSSARD

Witnesses:

CHARLES. S. GOODING,
ANNIE J. DAILEY.