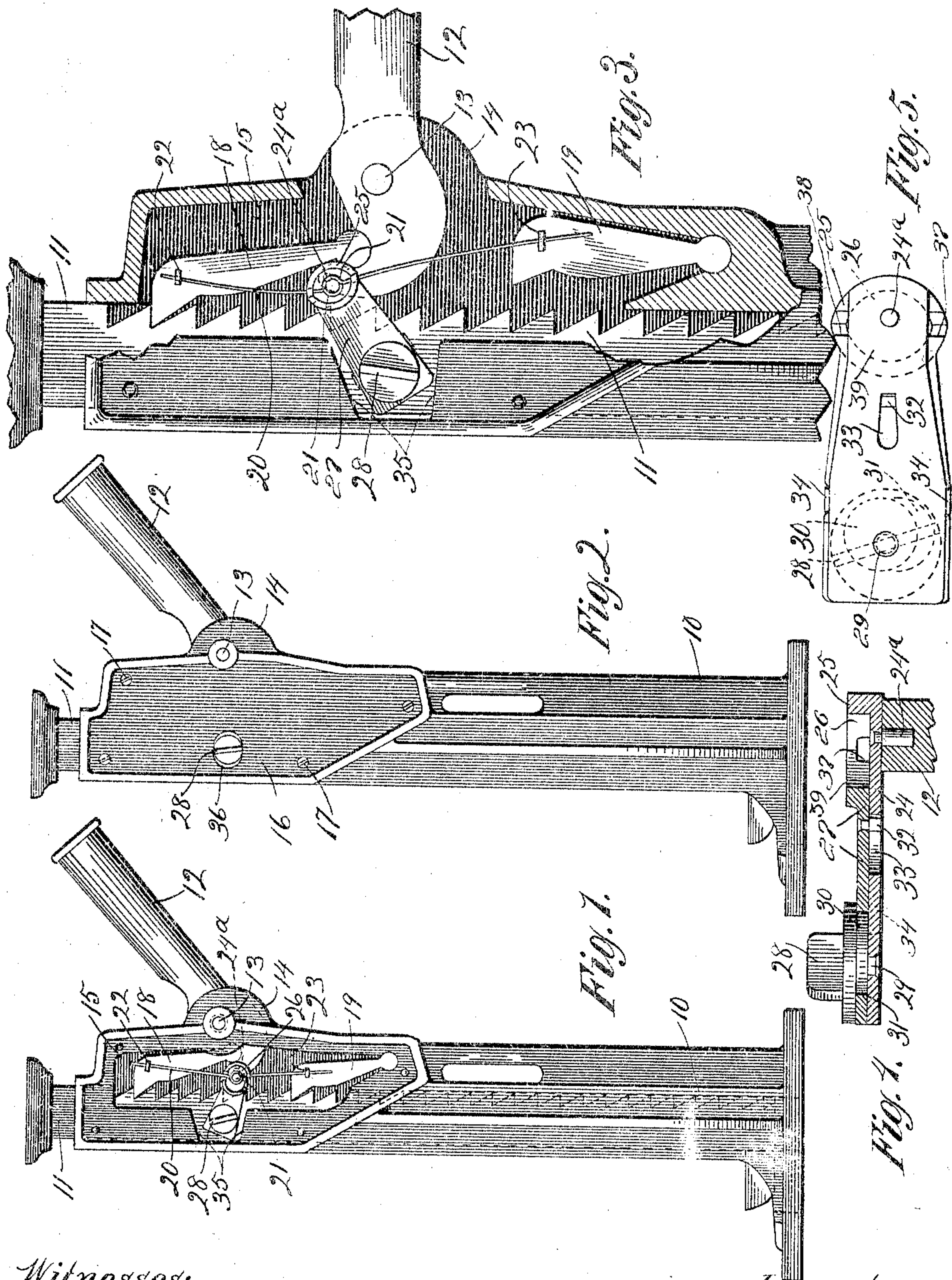


No. 811,731.

PATENTED FEB. 6, 1906.

H. M. MARSH.
LIFTING JACK.

APPLICATION FILED OCT. 4, 1905.



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HUGH M. MARSH, OF CHICAGO, ILLINOIS.

LIFTING-JACK.

No. 811,731.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed October 4, 1905. Serial No. 281,305.

To all whom it may concern:

Be it known that I, HUGH M. MARSH, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Lifting-Jacks, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

10 The invention relates to a lifting-jack of that type in which there is provided a lifting-bar having a sliding engagement with a suitable standard and having ratchet-teeth formed upon one of its faces with which two
15 pawls—one attached to an actuating-lever and the other pivotally secured to the standard—coöperate for raising and lowering the bar and for supporting it in any desired position.

20 More especially, the invention relates to a jack of this type in which the movement of the pawls into and out of engagement with the ratchet-teeth of the lifting-bar is controlled by a spring which is flexed during the
25 operation of raising to urge both of the pawls into engagement with the bar and during the operation of lowering to alternately move each of the pawls into and out of engagement with the bar as the actuating-lever is oscillated.

30 The object of the invention is to provide in a jack of the type described reliable means for controlling the movement of the pawls, the efficiency of which shall not be impaired
35 by the wearing away of the parts.

A detail of the invention provides that one of the pawls shall be thrown into engagement with the lifting-bar by gravity in case the spring controlling the movement of the pawls
40 should break at any time during the operation.

45 The invention consists in the construction and arrangement of parts to be hereinafter described and claimed and as illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a lifting-jack constructed according to the invention, a portion of the outer casing being removed to show the internal construction. Fig. 2 is
50 similar to Fig. 1 with the outer casing in place. Fig. 3 is similar to Fig. 1, but showing the parts in a different position. Fig. 4 is a central longitudinal section of one of the parts, and Fig. 5 is a rear elevation of the
55 part shown in Fig. 4.

The jack comprises a suitable standard 10

and a lifting-bar 11, both of ordinary construction, the lifting-bar sliding vertically within the standard and having the usual ratchet-teeth formed upon one of its sides. 60 An actuating-lever 12 is pivoted at 13 to the standard 10, which is extended, as indicated at 14 14, to provide a suitable bearing for the pivot and a housing 15 for other movable parts. Preferably a portion of one side of 65 the standard 10 is made removable to form an openable cover-plate 16 for the housing 15, which will normally be attached by screw-bolts 17 17 and is shown as having been removed in Figs. 1 and 3. A pawl 18 is pivotally 70 attached to the inner end of the actuating-lever 12 for communicating the motion on the lever to the lifting-bar, and a retaining-pawl 19 is pivotally attached to the standard 10, preferably some distance below the pawl 75 18.

As so far described the device is of well-known construction, the novel features of the invention residing in the construction and operation of the mechanism for controlling the 80 movement of the pawls 18 and 19 into and out of engagement with the ratchet-teeth of the lifting-bar 11. For this purpose there is provided a spring-rod 20, preferably being formed in a coil 21 of one or more turns about 85 midway of its length to increase its flexibility and having a sliding engagement with a loop 22 23 on each of the pawls 18 and 19. This spring is adapted to be flexed to control the movement of the pawls by means of an arm 90 which is pivotally attached to the inner end of the actuating-lever 12 by means of a pin 24^a, as clearly shown in Fig. 4, and which has a shoulder 25 extending transversely across its end and bearing against the spring. As 95 shown, the movement of the farther end of the arm is guided by the walls of a recess 35, formed in the wall of the standard, to impart a rocking movement to the arm as the actuating-lever 12 is oscillated, the arm swinging in 100 the reverse direction from the movement of the lever. Preferably the shoulder 25 is recessed, as indicated at 26, to receive the coil 21.

A movable jaw 27, having a sliding engagement 105 with the arm 24, coöperates with the shoulder 25 for flexing the spring 20 when the device is to be employed for lowering a load. This jaw is controlled by means of a turn-button 28, rotatably secured to the arm 110 24, as shown at 29, and having an eccentric portion 30, which coöperates with a slotted

aperture 31 in the movable jaw 27 to reciprocate it. The movement of the jaw on the arm 24 is guided by a pin 32, projecting into a slot 33, formed in the arm, and by means of flanges 34 34, which engage the side edges of the arm. The turn-button 28 projects through the cover-plate 16, so as to be conveniently accessible for manually adjusting the position of the jaw 27, a slotted aperture 36 in the cover-plate being provided to allow for the necessary horizontal movement of the turn-button as the arm 24 is rocked by the actuating-lever.

The operation of the device is as follows:
 15 The spring-rod 20 is normally substantially straight, and the shoulder 25, over which it is hooked, is preferably so disposed as to flex the spring slightly to the left of a line joining the guide-loops 22 23 as viewed in Fig. 1.
 20 When the jack is to be used for raising a load, the movable jaw 27 is thrown back, so that the spring-rod 20 rests freely against the shoulder 25 and continually urges both of the pawls 18 and 19 into engagement with the ratchet-teeth of the lifting-bar. With the parts in this position the actuating-lever 12 may be operated in the ordinary manner for raising the bar, the rocking of the arm 24 as the lever oscillates causing the spring-rod 20
 25 to flex more or less, but always in the same direction. If, however, it is desired to use the device for lowering a load, the movable jaw 27 will be thrown forward on the arm 24 by manually rotating the turn-button 28, the disposition of the eccentric 30 being such that this position of the jaw is self-sustaining against backward pressure. When in this position, the forward edges 37 38 of the jaw 27, as well as the edges of the shoulder 25, engage the spring-rod 20 in alternation as the arm 24 is rocked by the movement of the actuating-lever 12. In this way the spring-rod is flexed in the form of a double curve or S shape, as shown in Fig. 3, and the direction
 30 of curvature is reversed by each movement of the actuating-lever. When, therefore, this lever reaches the limits of its up-and-down movements, that pawl not at the moment supporting the load will be thrown out of engagement with the ratchet-teeth of the lifting-bar, the retaining-pawl 19 being thrown out to permit the bar to descend with the lifting-pawl 18 when the latter occupies its highest position, the lifting-pawl 18 being thrown
 35 out when in its lowest position to permit it to be raised without lifting the bar. Moreover, the forms assumed by the spring are such that as it bears upon one of the pawls to release it it also reacts upon the other pawl to engage it with the ratchet-bar, and, as shown, the parts have been so proportioned that the spring-rod is not curved to exert sufficient force for releasing one of the pawls until after it has advanced the other pawl, and the lifting-bar is therefore always supported by at

least one of them. It will be readily understood that, as shown, this effect is produced because of the fact that the arm 24 rocks in the opposite direction from the movement of the actuating-lever 12, as previously described.

Preferably the pivotal supports for both of the pawls are so disposed that neither of the pawls is ever thrown back of a vertical position, and both of them would fall by their own weight into engagement with the ratchet-bar to support it should the spring-rod 20 be broken at any time.

The spring-rod 20 is prevented from working longitudinally out of its seat by means of the recess 26, formed in the shoulder 25 of the arm 24, which receives the coil 21, a corresponding recess 39 being formed in the face of the jaw 27, which coöperates with it to completely surround the coil when the lowering position has been assumed.

I claim as my invention—

1. In a lifting-jack, in combination, a standard, a lever pivoted to the standard, a rack-bar in sliding engagement with the standard, a pawl carried by the lever, a spring-rod engaging the pawl, and means carried by the lever for engaging the spring to deflect it as the lever makes its stroke.

2. In a lifting-jack, in combination, a standard, a lever pivoted to the standard, a rack-bar in sliding engagement with the standard, a pawl pivoted to the standard, a pawl pivoted to the lever, a spring-rod connecting the pawls, and a spring-deflector carried by the lever.

3. In a lifting-jack, in combination, a standard, a lever pivoted to the standard, a rack-bar in sliding engagement with the standard, a pawl pivoted to the standard, a pawl pivoted to the lever, a spring-rod connecting the pawls, and a spring-deflector pivotally united to the lever and engaging the wall of the standard.

4. In a lifting-jack, in combination, a standard, a lever pivoted to the standard, a rack-bar in sliding engagement with the standard, a pawl pivoted to the standard, a pawl pivoted to the lever, a spring-rod connecting the pawls, a spring-deflector pivotally united to the lever and engaging the wall of the standard, and a movable jaw mounted on the spring-deflector.

5. In a lifting-jack, in combination, a standard, a lever pivoted to the standard, a rack-bar in sliding engagement with the standard, a pawl pivoted to the standard, a pawl pivoted to the lever, a spring-rod connecting the pawls, an arm pivotally secured to the lever and in sliding engagement with the standard, a shoulder set transversely on the arm, and a movable jaw mounted on the arm.

6. In a lifting-jack, in combination, a standard, a lever pivoted to the standard, a

rack-bar in sliding engagement with the standard, a pawl pivoted to the lever, a pawl pivoted to the standard, a spring-rod bearing on the pawls and having a coil intermediate its ends, and a spring-deflector carried by the lever and recessed to receive the coil.

7. In combination, a ratchet member, two pawls engaging the ratchet member, a spring-rod connecting the pawls, a pivoted lever for actuating one of the pawls, and a spring-deflector carried by the lever.

8. In a lifting-jack, in combination, a standard, a ratchet-bar reciprocating in the standard, a hand-lever pivoted to the standard, a pair of pawls engaging the bar, one being pivoted to the standard and the other to the lever, a spring-rod uniting the pawls, an arm pivoted to the lever and in sliding engagement with the standard and having transverse jaws engaging the spring.

9. In a lifting-jack, in combination, a standard, a ratchet-bar reciprocating in the standard, a hand-lever pivoted to the standard, a pair of pawls engaging the bar, one being pivoted to the standard and the other to the lever, a spring-rod uniting the pawls; an arm pivoted to the lever and in sliding engagement with the standard and having a transverse shoulder engaging the spring, a jaw slidingly engaging the arm, and an eccentric mounted on the arm and controlling the jaw.

10. In a lifting-jack, in combination, a standard, a ratchet-bar reciprocating in the standard, a lever, a spring-actuated pawl, and automatic means for reversing the spring action on the pawl as the lever approaches the limits of its stroke.

11. In a lifting-jack, in combination, a standard, a ratchet-bar reciprocating in the standard, a lever, a spring-controlled pawl pivoted on the lever, a spring-controlled retaining-pawl pivoted on the standard, and means carried by the lever for reversing the spring action on the pawls as the lever reaches the limits of its stroke.

12. In a lifting-jack, in combination, a standard, a ratchet-bar reciprocating in the standard, a lever, a spring-controlled pawl pivoted on the lever, and means carried by the lever for reversing the spring action on the pawl as the lever reaches the limits of its stroke.

13. In a lifting-jack, in combination, a standard, a ratchet-bar reciprocating in the standard, a lever, a spring-controlled retaining-pawl pivoted on the standard, and means carried by the lever for reversing the spring action on the pawl as the lever reaches the limits of its stroke.

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