

L. E. JOHNSON.
LIFTING JACK.
APPLICATION FILED MAR. 23, 1918.

1,304,882.

Patented May 27, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

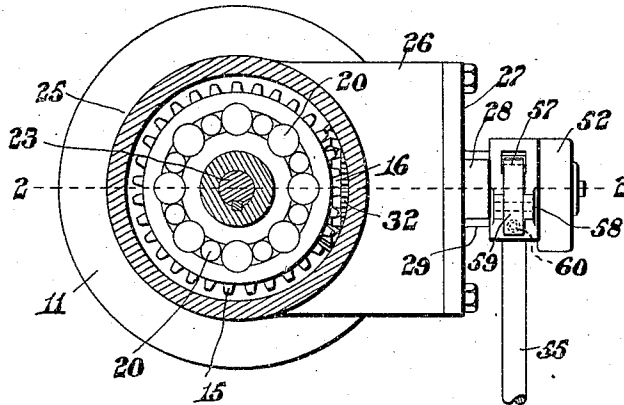
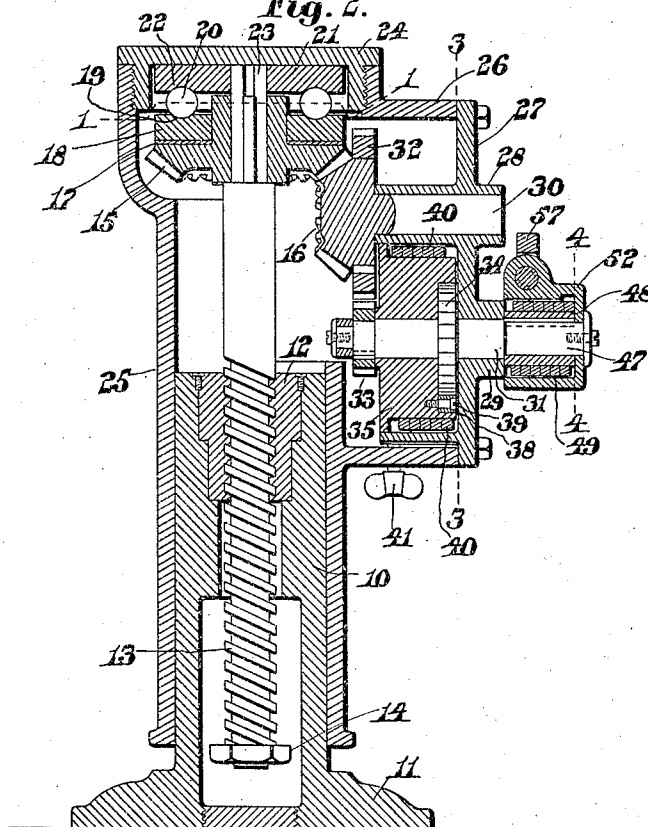


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

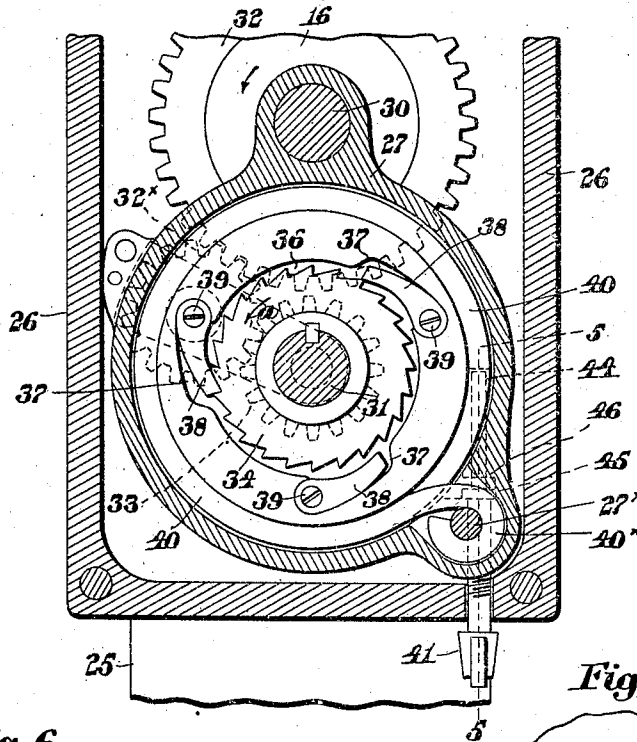


Fig. 4.

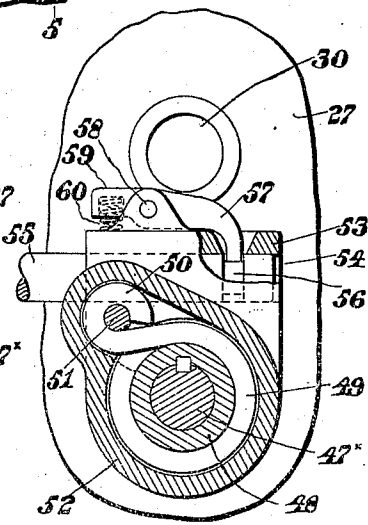


Fig. 5.

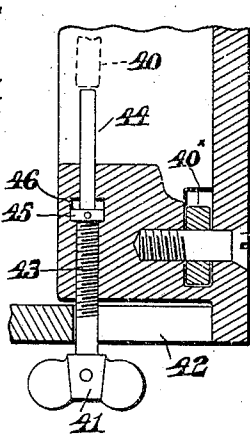
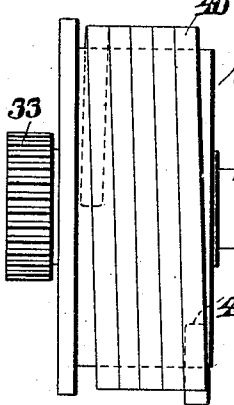


Fig. 6.



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UNITED STATES PATENT OFFICE.

LAWRENCE E. JOHNSON, OF MELROSE, MASSACHUSETTS, ASSIGNOR TO MATTIE S. JOHNSON, OF MELROSE, MASSACHUSETTS.

LIFTING-JACK.

1,304,882.

Specification of Letters Patent.

Patented May 27, 1919.

Application filed March 23, 1918. Serial No. 225,376.

To all whom it may concern:

Be it known that I, LAWRENCE E. JOHNSON, a citizen of the United States of America, and a resident of Melrose, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Lifting-Jacks, of which the following is a specification.

This invention relates to lifting jacks, and has for its object the production of a device of this character in which the vertically moving member may be readily elevated and retained in elevated position until released by the operator to permit the lowering of the load.

The invention consists in providing the lateral shaft of the elevating mechanism with gripping means which will normally retain the vertically moving member in any position to which it may be raised, but which may be manually released when it is desired to lower said member, said gripping mechanism being associated with an actuating member which in its movement in one direction will increase the grip upon said shaft, while in its movement in the opposite direction the grip upon said shaft will be removed.

The invention further consists in certain novel features of construction and arrangement of parts which will be readily understood by reference to the description of the drawings and to the claims hereinafter given.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized, and that the invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described, except as required by the scope of the appended claims.

Of the drawings:

Figure 1 represents a horizontal section of a lifting jack embodying the principles of the present invention.

Fig. 2 represents a vertical section of same on line 2, 2, on Fig. 1.

Fig. 3 represents an enlarged vertical section of the lifting mechanism of said jack, the cutting plane being on line 3, 3, on Fig. 2.

Fig. 4 represents a vertical section on line 4, 4, on Fig. 2.

Fig. 5 represents a vertical section on line 5, 5, on Fig. 3, and

Fig. 6 represents an elevation of the lateral shaft of the lifting mechanism with the gripping mechanism therefor.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings 10 is a stationary member provided with a base 11.

In the upper end of the stationary member 10 is positioned a non-revoluble nut 12 to which is threaded the screw 13 provided at its lower end with a shouldered nut 14 to limit the upward movement of said screw.

The upper end of said screw has keyed or otherwise secured thereto a bevel gear 15 meshing with a bevel gear 16 forming a part of the lifting mechanism.

Surrounding the hub of the gear 15 is a fiber washer 17 and an annular plate 18, the latter having formed in its upper face a groove 19 in which rest a plurality of anti-friction members 20 on which rests another annular plate 21 having a groove 22 in its under face into which the anti-friction members 20 project.

The upper reduced end 23 of the screw 13 is adapted to freely revolve in the plate 21 which has superimposed thereon the closure 24 of a cylinder 25 the lower end of which surrounds the stationary member 10 and is movable vertically thereon.

From the side of said cylinder 25 projects a rectangular casing 26 having a closing plate 27 having bearings 28 and 29 therein to receive the lateral shafts 30 and 31 which are parallel to each other.

The shaft 30 is preferably formed integral with the bevel gear 16 as shown in the drawings and said bevel gear 16 has keyed or otherwise secured thereto a spur gear 32 which meshes with an intermediate gear 32^x which in turn meshes with a pinion 33 keyed or otherwise secured to the shaft 31.

The shaft 31 has keyed or otherwise secured thereto a ratchet wheel 34 and interposed between the ratchet wheel 34 and the pinion 33 and loosely mounted on the shaft 31 is a sleeve 35.

The outer end of the sleeve 35 is chambered out as at 36 to inclose the ratchet

wheel 34 and in recesses 37 in said sleeve 35 are positioned pawls 38 movable about pivots 39 into engagement with the teeth of the ratchet wheel 34.

5 Preferably three pawls 38 are used spaced equally about the axis of the shaft 31 and at least one of which will, by its own weight, be engaged with said ratchet wheel 34 at all times.

10 The periphery of the sleeve 35 is surrounded by a helical spring member 40 one end of which is anchored by means of a pin 27* in the closure 27 extending through an eye 40* formed in the outer end of said spring member 40.

The spring member 40 is normally in gripping contact with the sleeve 35 thereby preventing the said sleeve turning about the axis of the shaft 31.

20 The grip upon said sleeve 35 is sufficient to prevent the lowering of the member 25 under the load supported thereby until the grip upon said sleeve is released by the operator.

The releasing of the gripping of the member 40 is accomplished by the manually operated member 41 extending through a slot 42 in the casing 26 and threaded as at 43 to the closure 27.

30 The member 41 is provided with a reduced shank 44 the end of which is adapted to be moved against the inner end of the member 40 and move said inner end sufficiently to expand said member 40, thereby causing it to release its grip upon the sleeve 35 and permit said sleeve to be rotated about the axis of said shaft 31.

In raising the movable member 25 the shaft 31 is rotated in the direction of the arrow *a* on Fig. 3 of the drawings, and by means of the pawl 38 the rotation of the ratchet wheel 34 relatively to the sleeve 35 is limited to a movement in one direction only.

The movement of the shaft in a reverse direction to that indicated by the arrow *a* is prevented as long as the member 40 remains in gripping contact with the sleeve 35, but as soon as the member 40 has been released from its grip upon the sleeve the shaft 31 may rotate in a reverse direction, carrying with it the sleeve 35, thus permitting the lowering of the movable member 25. The rapidity of the lowering may be regulated by the member 41, it being obvious that the rotation of the sleeve 35 will be retarded more or less depending on the degree of frictional contact that there may be between said sleeve 35 and spring member 40.

To the reduced shank 44 is pinned a collar 45 in a recess 46 in the closure 27, and this collar 45 coacting with the upper and lower walls of said recess 46 regulates the amount of movement of said member 41 and the consequent expansion of the gripping member 40.

95 The outer end of the shaft 31 is provided

with a reduced end 47 to which is keyed a tube 48 surrounded by a helical gripping member 49, one end of which has formed therein an eye 50 through which extends a pin 51 mounted in an actuating device 52. 70

This actuating device 52 is provided with a lateral projection 53, having a hole 54 extending therethrough adapted to receive the end of an operating handle 55.

The inner end of the handle 55 has an annular groove 56 therein, into which extends the end of a latch 57, pivoted at 58 to the projection 53. Between the opposite end 59 of said latch 57 and said projection 53 is interposed a spring 60 to retain said latch in locking engagement with the handle 55. 75

By depressing the end 59 against the tension of the spring 60 the latch 57 may be disengaged from the groove 56 thereby permitting the removal of said handle 55 from the hole 54 in said actuator 52. 80

When this change has been made the shaft 31, and the gripping mechanism thereon will be actuated as before through the medium of the gears 32, 32* and 33. 85

When it is desired to raise the movable member 25 the operator grasps the handle and depresses the same, thereby increasing the grip on the tube 48, and causing a movement contra-clockwise of the shaft 31 and the ratchet 34 thereon. 90

In raising the handle the grip of the member 49 on the tube 48 is released, and without moving the shaft 31, the actuator 52 is returned to its normal position preparatory to another downward movement of said handle. 100

At each downward stroke of the handle 55, rotary movement in the direction of arrow *a*, Fig. 3, is imparted to the shaft 31, and through the gears 33, 32* and 32 to the bevel gear 16, which in turn through the bevel gear 15, rotates the screw 13 in the stationary nut 12, and raises the member 25. 105

The grip of the member 40 on the sleeve 35 retains the movable member 25 in raised position until the operator releases the grip by means of the member 41, and the load on the movable member 25 will force said member downwardly at a speed regulated by the adjustment of the position of the member 41. 110

This makes a very effective brake for lifting jacks, which is positive in action.

It is believed that the operation and many advantages of the invention will be thoroughly understood without further description. 120

Having thus described my invention, I claim—

1. The combination of an operating shaft; a sleeve loosely mounted on said shaft; means interposed between said sleeve and shaft limiting the movement of said shaft relatively to said sleeve to one direction only; a helical spring surrounding and 130

normally gripping the periphery of said sleeve, said spring having one end fastened and the other end free; and a member co-acting with the free end of said spring and adjustable to release the gripping action of said spring.

2. The combination of an operating shaft; a sleeve loosely mounted on said shaft; means interposed between said sleeve and shaft limiting the movement of said shaft relatively to said sleeve to one direction only; a helical spring surrounding and normally gripping the periphery of said sleeve, said spring having one end fastened and the other end free; an adjustable member having an end adapted to bear against the free end of said spring and release its gripping action; and means for limiting the movement of said member.

3. The combination of an operating shaft; a sleeve loosely mounted on said shaft; means interposed between said sleeve and shaft limiting the movement of said shaft relatively to said sleeve to one direction only; a helical spring surrounding and normally gripping the periphery of said sleeve, said spring having one end fastened and the other end free; an adjustable member having an end adapted to bear against the free end of said spring and release its gripping action; and a collar on said member for limiting the movement thereof.

4. The combination of an operating

shaft; a sleeve loosely mounted on said shaft; means interposed between said sleeve and shaft limiting the movement of said shaft relatively to said sleeve to one direction only; means normally gripping said sleeve and preventing its rotation; a manually controlled device for releasing said gripping means; a tube keyed to said shaft; a member surrounding and normally gripping said tube; and an actuator for said shaft to which one end of said tube-gripping member is secured.

5. The combination of an operating shaft; a sleeve loosely mounted on said shaft; means interposed between said sleeve and shaft limiting the movement of said shaft relatively to said sleeve to one direction only; means normally gripping said sleeve and preventing its rotation; a manually controlled device for releasing said gripping means; a tube keyed to said shaft; a member surrounding and normally gripping said tube; an actuator for said shaft to which one end of said tube-gripping member is secured; and a handle detachably secured to said actuator.

Signed by me at 4 Post Office Square, Boston, Mass., this 20th day of March, 1918.

LAWRENCE E. JOHNSON.

Witnesses:

WALTER E. LOMBARD,
NATHAN C. LOMBARD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."