J. O. BARRETT.

LIFTING JACK.

APPLICATION FILED JUNE 22, 1920.

1,390,867.

Patented Sept. 13, 1921.

3 SHEETS—SHEET 1.

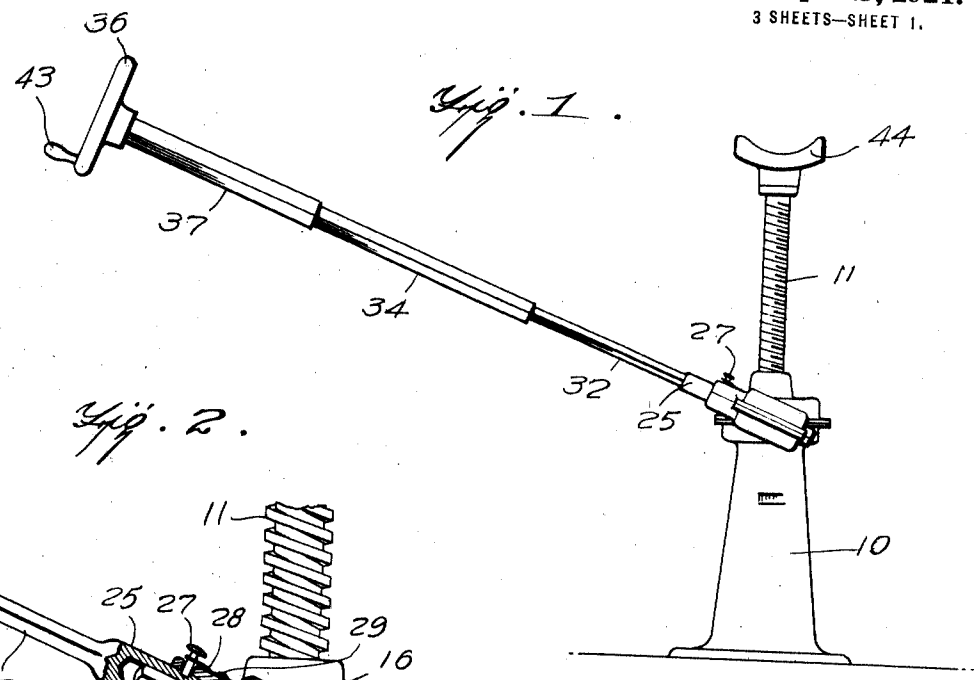


Fig. 1.

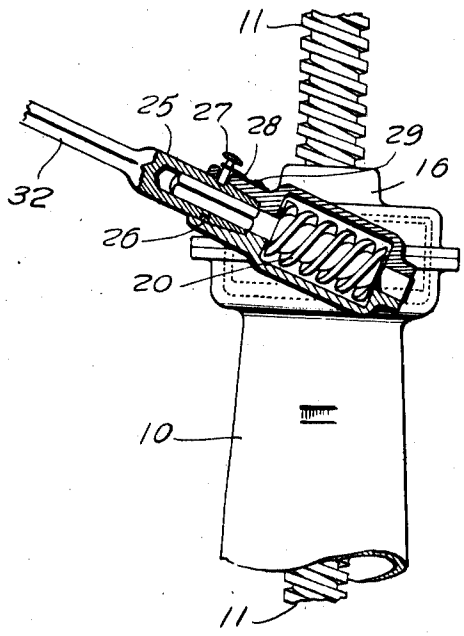


Fig. 2.

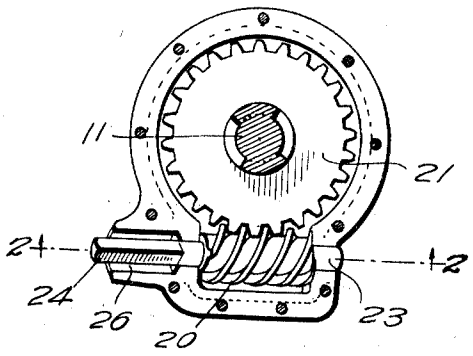


Fig. 3.

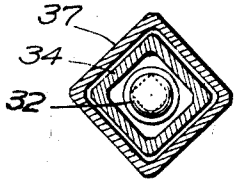


Fig. 7.

Jacob O. Barrett

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BY

ATTORNEY.

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3 SHEETS—SHEET 2.

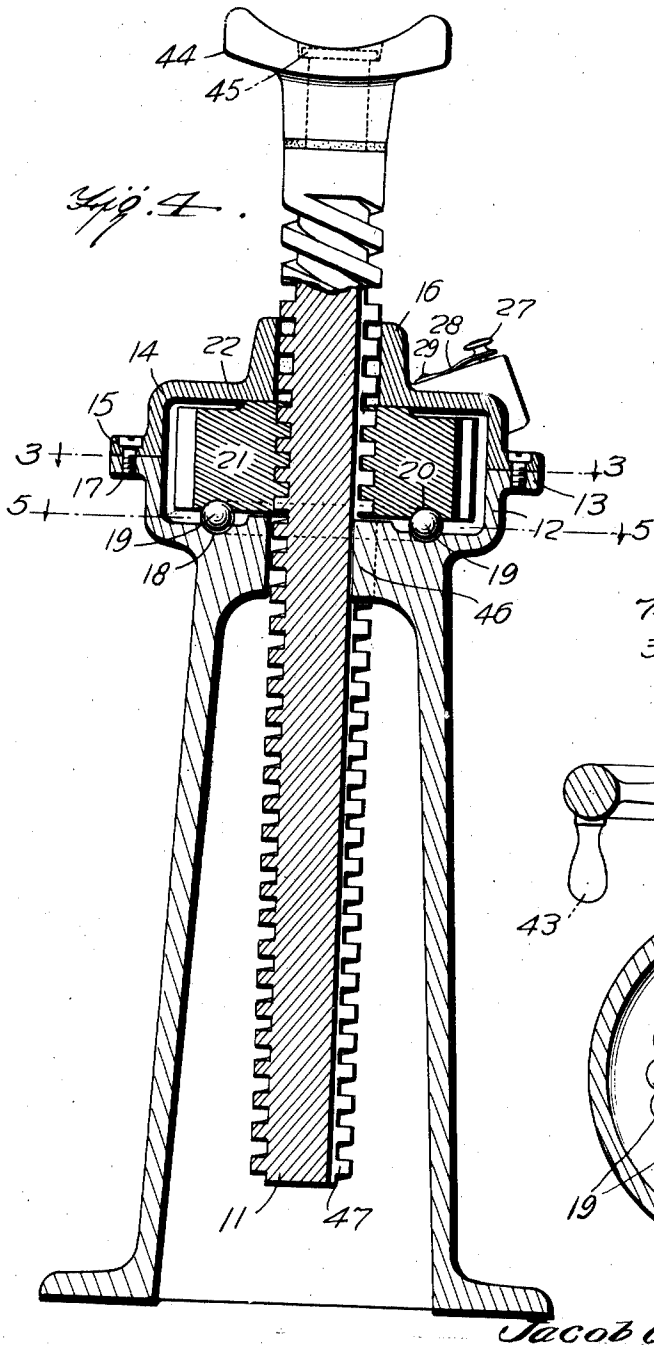


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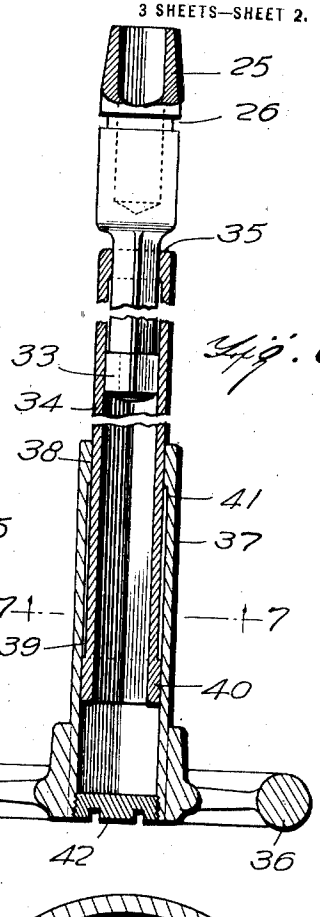


Fig. 6.

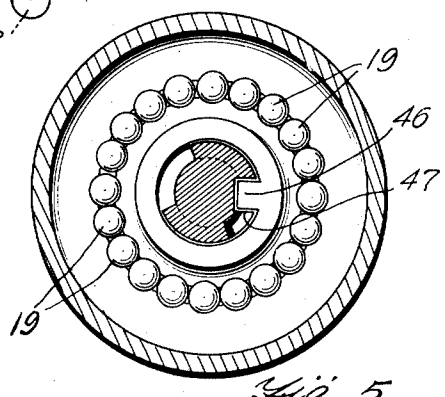


Fig. 5.

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3 SHEETS—SHEET 3.

Fig. 9.

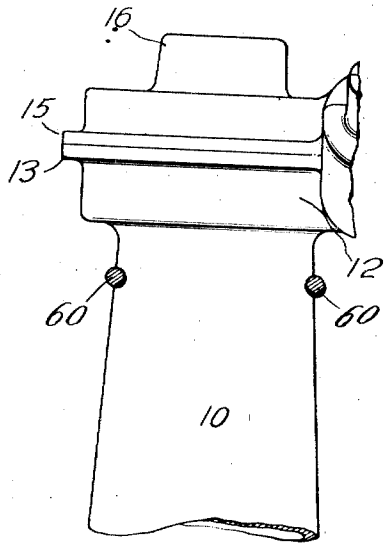


Fig. 8.

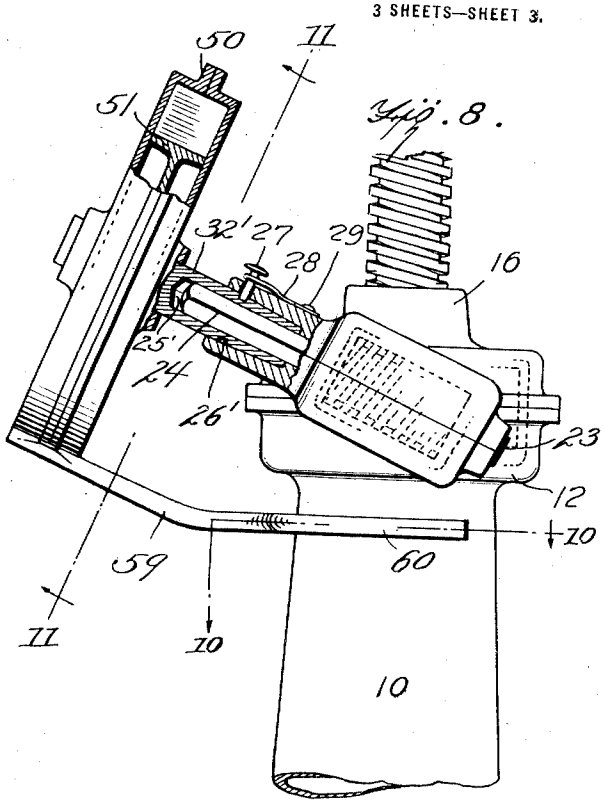
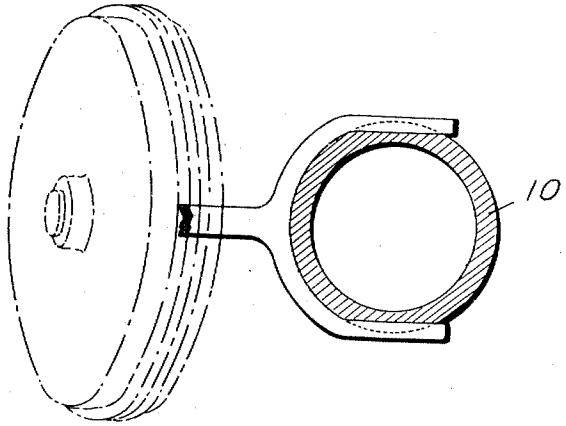


Fig. 10.



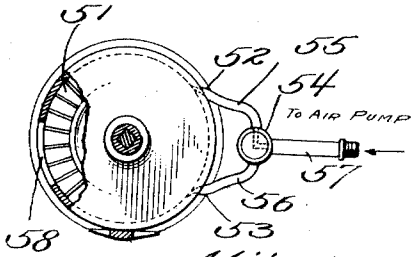


Fig. 11.

Jacob O. Barrett. INVENTOR.

BY Owen L. Norris

ATTORNEY.

UNITED STATES PATENT OFFICE.

JACOB O. BARRETT, OF ASHEVILLE, NORTH CAROLINA, ASSIGNOR OF ONE-HALF TO WILLIAM W. BRUCE, OF ASHEVILLE, NORTH CAROLINA.

LIFTING-JACK.

1,390,867. Specification of Letters Patent. Patented Sept. 13, 1921.

Application filed June 22, 1920. Serial No. 390,859.

To all whom it may concern:

Be it known that I, JACOB O. BARRETT, a citizen of the United States, residing at Asheville, in the county of Buncombe and State of North Carolina, have invented new and useful Improvements in Lifting-Jacks, of which the following is a specification.

This invention relates to lifting jacks and has particular utility in connection with the lifting of motor vehicles or the wheels thereof.

An object of the invention is to provide a lifting jack of simple and economical construction and one that can be easily operated.

A further object of the invention is to eliminate ratchet devices in connection with operating mechanism of the jack and substitute irreversible gearing therefor.

Another object of the invention is to provide an anti-friction bearing in connection with the gearing of the jack.

Another object of the invention is to provide power means for operating the jack, that may be used alternatively as a substitute for the manually operated mechanism.

In order that the jack may be operated without assuming an uncomfortable bending position, an extensible handle is provided which may be extended according to the convenience of the operator and used as a transmission device for communicating the motion of a hand wheel to the gearing of the jack.

Other objects of the invention and novel details of construction will become apparent on reference to the specification in which the invention is described in connection with the accompanying drawings, which illustrate the preferred form of my invention.

In the drawings:—

Figure 1 is a side elevation showing the handle in extended position.

Fig. 2 is a sectional view on the line 2—2 of Fig. 3 showing the worm gearing and spring clip for retaining the extensible handle in position.

Fig. 3 is a sectional view on the line 3—3, of Fig. 4.

Fig. 4 is a vertical sectional view through the jack.

Fig. 5 is a section on the line 5—5 of Fig. 4, looking in the direction of the arrows.

Fig. 6 is a longitudinal sectional view of the extensible handle.

Fig. 7 is a transverse section of Fig. 6 on the line 7—7.

Fig. 8 is a partial elevation and sectional view of a modified form of my invention wherein power means are utilized for operating the jack.

Fig. 9 is a partial elevation showing the supporting prongs for the motor casing.

Fig. 10 is a partial sectional view showing the supporting fork member in elevation, and the motor casing in dot and dash lines.

Fig. 11 is a detail view partially in section of the motor and the connections for operating the same.

Like numerals represent corresponding parts throughout the several views of the drawings.

The numeral 10 designates the base of the jack which is preferably hollow in order to provide clearance for the elevating screw 11. The sides of the base 10 are extended above the body portion so as to form annular wall 12 having a laterally disposed flange 13 formed thereon. The wall 12 forms the lower portion of a gear housing, the upper portion of which consists of a cover plate 14 having a flange 15 adapted to contact with the flange 13 of the annular wall 12 and also an upwardly extending hub 16 having an opening therein through which the elevating screw 11 extends. The upper and lower portions 14 and 12 respectively are detachably secured together by means of bolts 17 which engage in alining apertures formed through the contacting flanges. An annular groove 18 is cut in the upper portion of the base 10 and is adapted to receive ball bearings 19 which also engage in a corresponding groove 20 formed on the lower face of a worm wheel 21.

The worm wheel 21 is formed with a central opening and has screw threads formed thereon about its central opening which are adapted to engage the threads of the elevating screw 11. The upper surface of the gear 21 is provided with a boss 22 which is adapted to engage the lower surface of the cover 14 of the gear housing. The gear casing members 12 and 14 have integral extensions at one side provided with alining apertures adapted to receive an angularly disposed operating shaft 23, which is formed at one end with a square shank 24 for engaging in the square socket portion 25 of an operating handle. An opening 26 is formed in

the gear housing about the shank 24 of sufficient size to admit the socket portion 25 and permit free rotation. The socket portion 25 is formed on its exterior surface with an annular groove 26 which is adapted to engage a retaining pin 27 mounted on a leaf spring 28 which is riveted at one end to the casing as indicated at 29. To remove the handle it is only necessary to lift the retaining pin 27 and pull out on the handle. To apply the handle to the jack it is only necessary to push on the handle until the pin engages the groove 26 and thereby maintains the socket member in position. The terminal of the socket portion is slightly tapered so that its insertion into the socket may gradually lift the pin 27. A worm 30 is secured to the shaft within the housing extension and meshes with the teeth of the worm wheel 21 for the purpose for actuating the same thereby elevating the screw 11.

The extension handle, as shown, consists of a plurality of sections, the lower member 32 having the socket 25 at its lower end. The member 32 is of square section beyond the socket portion and is provided at its upper end with a head 33 slightly larger in diameter than the body portion thereof. The member 34 is hollow and formed interiorly with the rectangular sides adapted to slidingly fit over the square shaft 32 and at its lower end said member 34 is reduced in dimension so as to form a shoulder 35 which is adapted to engage the nut 33 so as to prevent the members of the extension handle from coming apart and also limit the exposed lengths of the handle members. A handwheel 36 is secured to the upper section 37, the latter being formed with reduced portion 38, and square inner surfaces 39 adapted to engage the square outer surface and the head 40 of the intermediate member 34 for the purpose of imparting rotation thereof. The shoulder 41 formed near the lower end of the upper member 37 is adapted to engage the head 40 so as to prevent the separation of the sections of the extension handle. A nut 42 is threaded to the upper end of the member 37 so as to close the opening therein. The hand wheel 36 may be provided with a handle 43 if desired for convenience of operation.

The upper end of the screw 11 is formed with a square shank adapted to engage in a squared recess formed in the V-block 44. The upper end of the shaft 11 is riveted over as shown at 45 so as to maintain the V-block 44 in position. A key 46 is mounted in the base 10 and coacts with a slot 47 formed in the elevating screw 11. Ordinarily the weight of the vehicle exerted on V-block 44 will keep the screw from turning but it is preferred to supply key 46 in order to entirely eliminate the necessity for stooping or bending over in applying the jack.

As an alternative operating means a power means in the form of an air motor may be employed, the source of compressed air being the air pump (not shown) driven in the usual manner from the engine of the motor vehicle. To this end a sectional motor casing 50 houses a rotor 51 of a reversible air motor, the air inlets to which are designated 52 and 53. A shaft 32′ is formed with a square socket 25′ adapted to operatively engage the square shank 24 of the shaft 23. The shaft 32′ is formed with an annular groove 26′ adapted to engage the retaining pin 27 in the same manner as above described for the groove 26. The rotor 51 is keyed or otherwise secured to the shaft 32′ so that said shaft will rotate with the motor. The air inlets 52 and 53 are connected to a valve 54 by means of the pipes 55, 56, respectively, and the valve 54 may connect either pipe with the common supply pipe 57 which leads to the air pump of the internal combustion engine. The outlet of the air motor is designated as 58. A forked member 59 is secured to the lower portion of the motor casing 50 and the prongs 60 thereof are adapted to engage in corresponding recesses formed in the base 10 of the jack in order to brace said casing and prevent vibration.

In operation the handle 36 is operated so as to lower the jack sufficiently for placing it under the rear axle of an automobile or other object to be lifted. It will be apparent that this can be accomplished without the disagreeable feature of stooping under the machine because the jack may be swung to position by means of the extension handle 32. The handle is then turned and by means of the worm 20 will turn the wheel 21 and the interior threads of the latter will elevate the screw 11 which is maintained against rotation by means of the key 46 engaging the slot 47. The handle 36 rotates the shaft sections 32, 34 and 37 until the object is lifted to the desired height. The worm gear being irreversible will retain the object in raised position. To remove the jack it is only necessary to operate the handle 36 in the opposite direction until the jack is lowered sufficient to be removed from under the object, which can be accomplished after lowering by pulling on the handle 36. On removing the extension handle the clip 27 is lifted and the shaft sections placed in telescoping relation so that the jack and handle may be placed in motor vehicles within a very limited space.

If is is desired to operate the jack by power means instead of manually it is only necessary to substitute the air motor for the extensible handle by engaging the socket portion 32′ of the former on the shank 24. Pipe 57 is then connected to the air pump of the engine which is placed in operation.

The valve 54 is turned so as to direct the air in order to rotate the motor in the desired direction for raising or lowering the jack.

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

1. In a lifting jack, a base, an elevating screw mounted therein, a gear housing mounted on said base, a worm wheel mounted in said housing having screw threads engaging said elevating screw, a ball bearing interposed between said worm wheel and said base, a worm mounted in said housing for actuating said worm wheel, means for retaining said screw against rotation, manually operated or power means for alternatively rotating said worm and a spring clip mounted on said base for engaging either of said means for yieldingly locking the same in operative position.

2. In a lifting jack, the combination of a base having recesses formed therein, an elevating screw, an angularly disposed shaft, gearing interposed between said shaft and screw, said shaft having a polygonal shank, a portable motor having a casing and a driving shaft, said driving shaft being formed with a socket portion adapted to engage said polygonal shank, and a forked member secured to said casing and engaging said recesses for bracing said casing and preventing excessive vibration.

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

JACOB O. BARRETT.

Witnesses:
J. Scroof Stylee,
Mrs. Geo. Sherrill.