

No. 751,336.

PATENTED FEB. 2, 1904.

M. V. H. PERKINS & G. Y. PATTERSON.

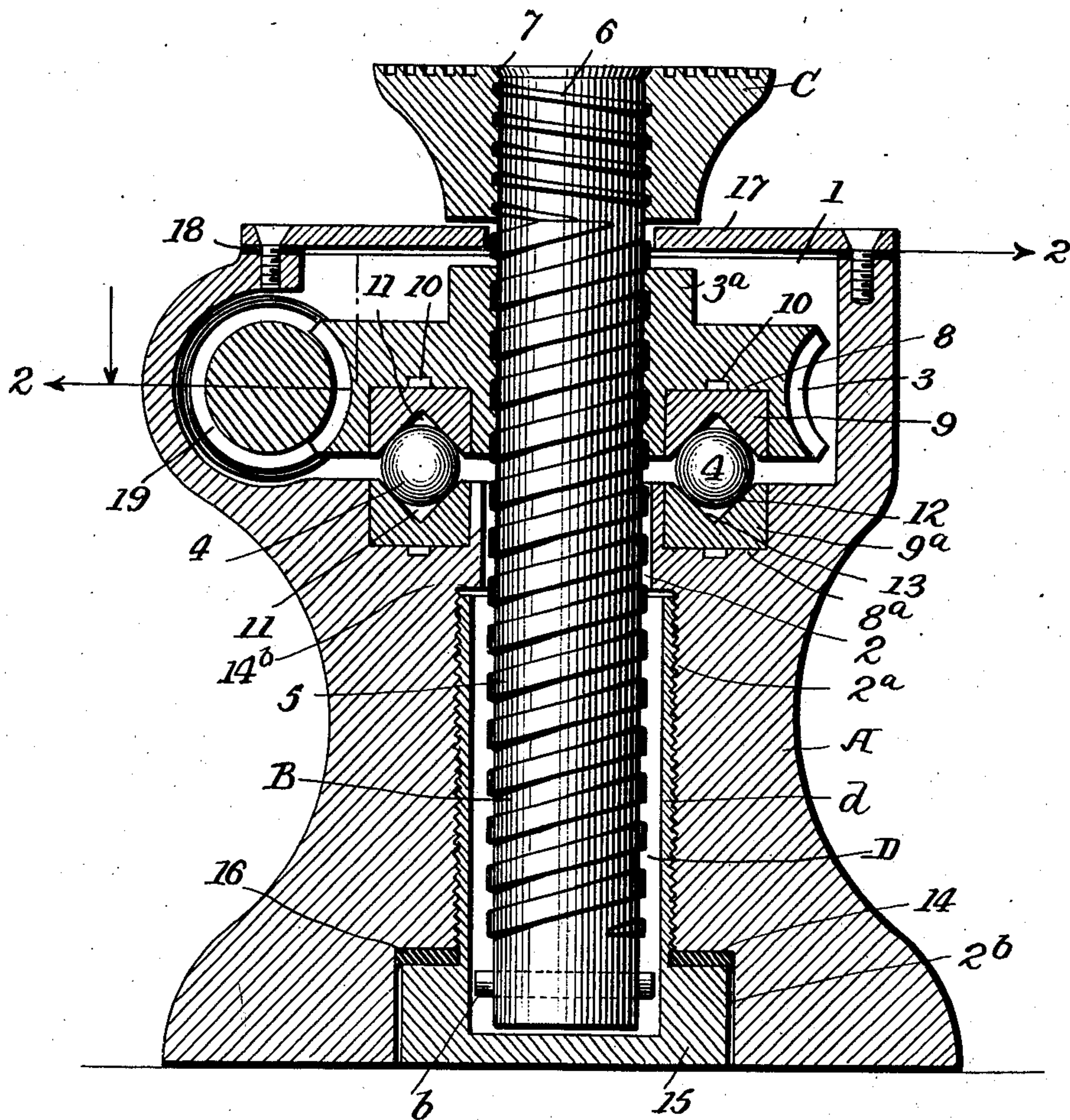
LIFTING JACK.

APPLICATION FILED MAR. 26, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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2 SHEETS—SHEET 2.

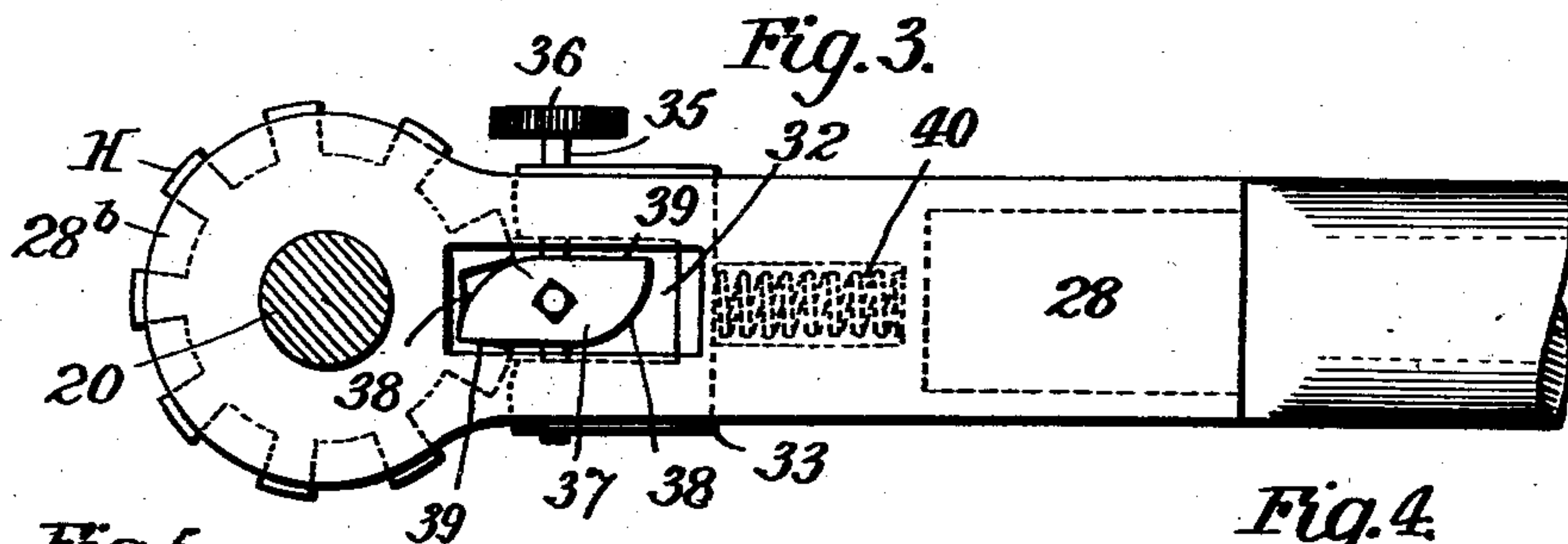
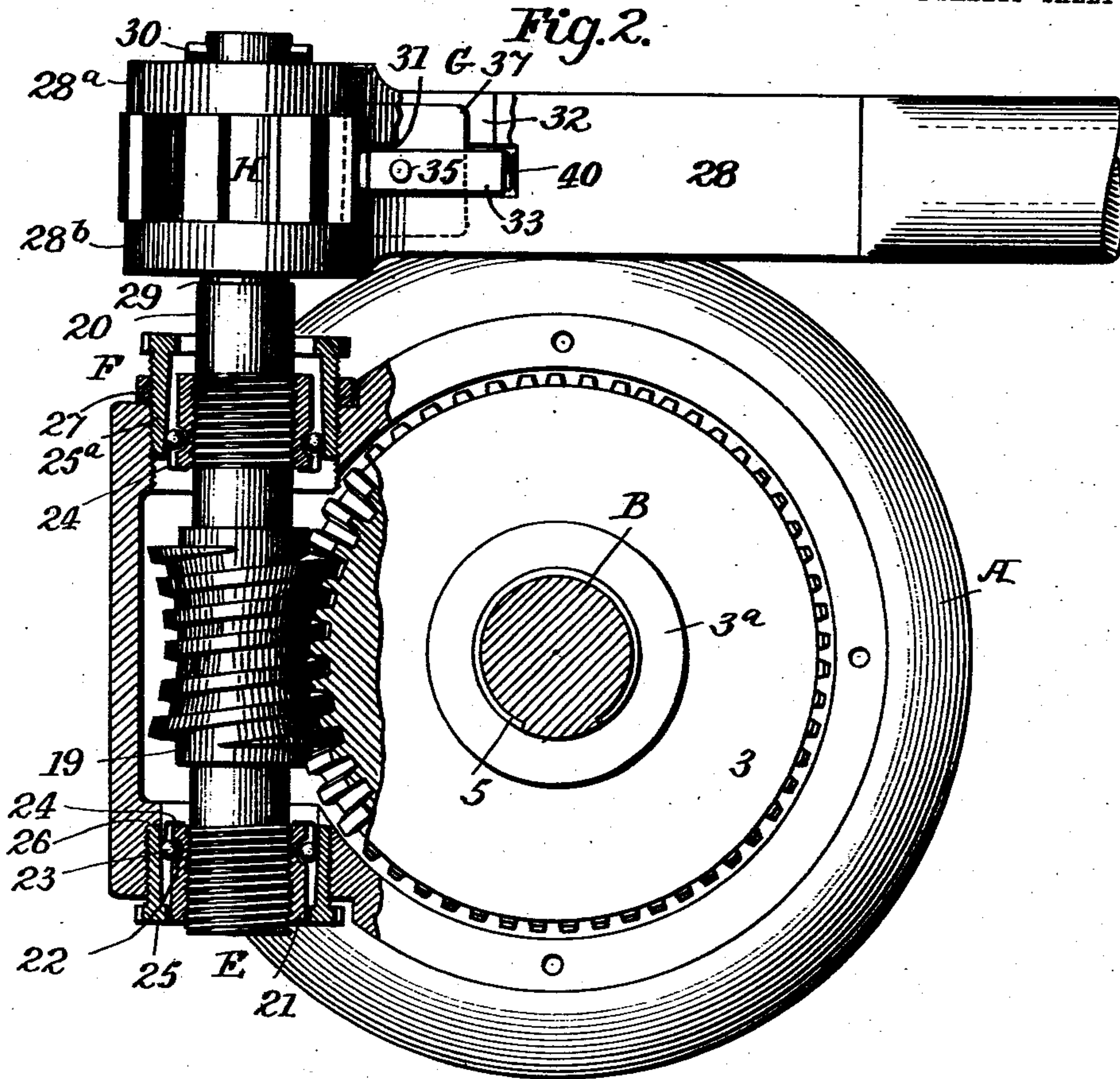
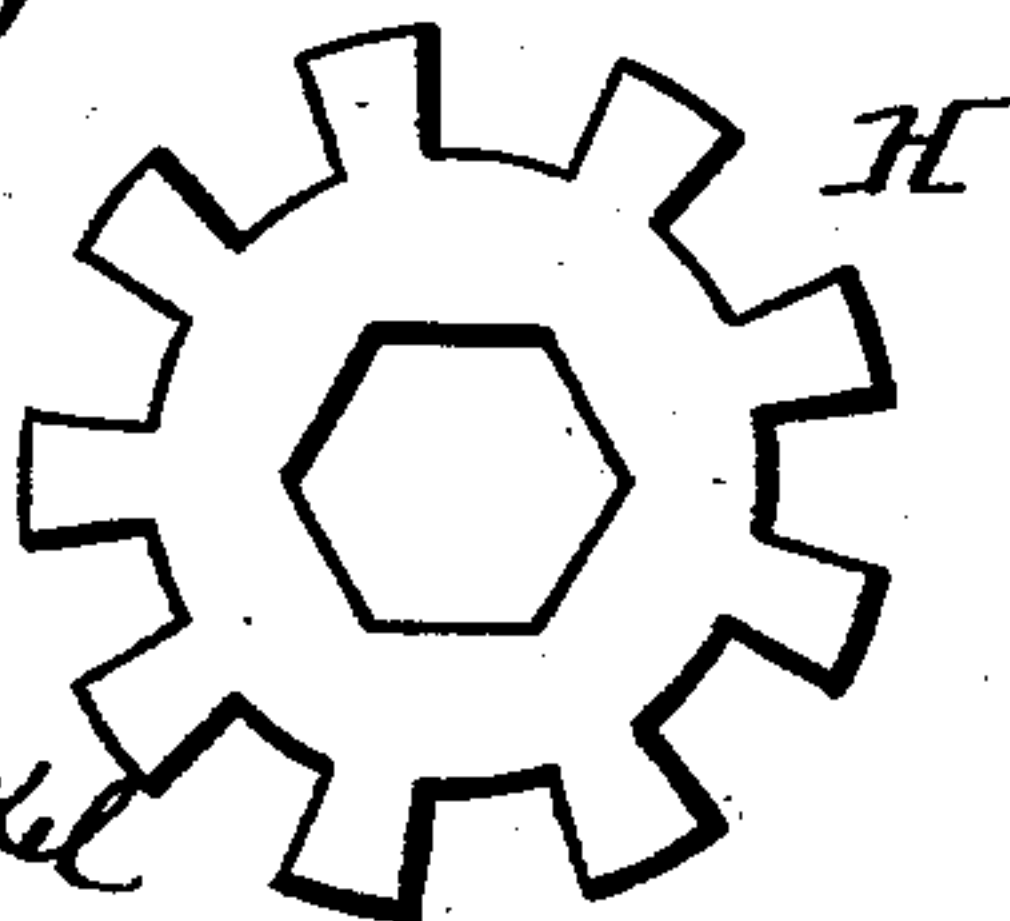


Fig. 5.

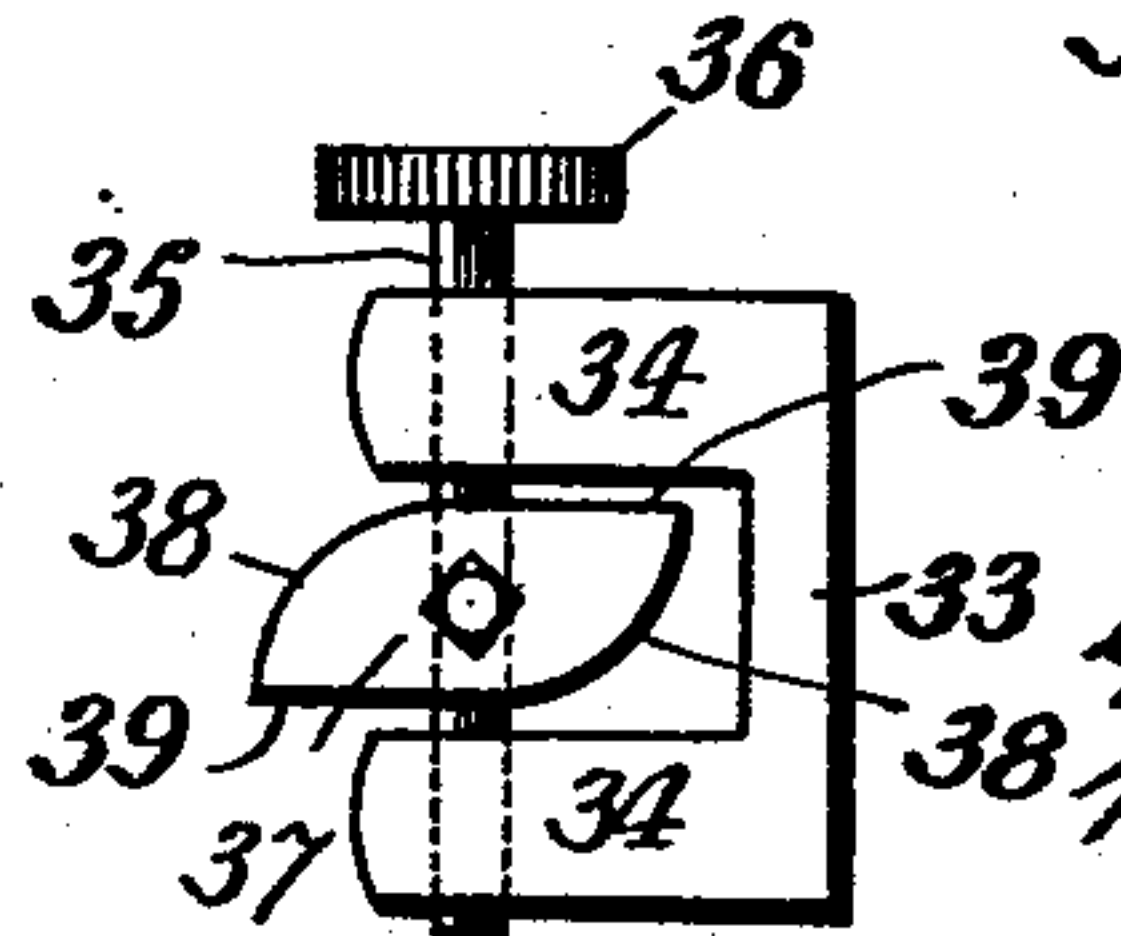


Witnesses

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Arnold H. Aruty

Fig. 4.



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UNITED STATES PATENT OFFICE.

MARTIN V. H. PERKINS, OF NEW YORK, AND GEORGE Y. PATTERSON, OF
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LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 751,336, dated February 2, 1904.

Application filed March 26, 1903. Serial No. 149,662. (No model.)

To all whom it may concern:

Be it known that we, MARTIN V. H. PERKINS, residing at New York, county of New York, and GEORGE Y. PATTERSON, residing at Brooklyn, county of Kings, State of New York, both citizens of the United States, have invented certain new and useful Improvements in Lifting-Jacks, of which the following is a specification.

This invention comprises improvements in lifting-jacks, the details of which will be pointed out in the following specification, taken in connection with the accompanying drawings, in which—

Figure 1 is a central vertical section through the lifting-jack. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a side view of the ratchet device for operating the jack. Fig. 4 is a similar view of the pawl and the slide in which the pawl is mounted, and Fig. 5 is a plan view of the ratchet-wheel.

Referring to the drawings, A indicates a standard of suitable form having a circular socket or recess 1 at its upper end and a central cylindrical opening 2, which extends downwardly through the center of the standard from said socket. Within the vertical opening 2 is arranged a lifting-screw B, which is supported and operated by a worm-wheel 3, the latter being arranged in the recess or socket 1 upon ball-bearings 4. The threads 5 of the lifting-screw engage corresponding threads in the worm-wheel, and when the latter is rotated the lifting-screw, which is prevented from rotating by the load upon it, is raised or lowered, according to the direction of rotation of the worm-wheel. A head or platform C, preferably serrated or roughened upon its upper surface, is secured to the upper end of the screw by means of threads 6 upon the screw, which are reversed in direction with respect to the threads 5, and the head of the screw is preferably riveted over at the top, as indicated by the numeral 7. The worm-wheel has an extended hub 3^a, which permits the wheel to be engaged by a sufficient number of threads to readily withstand the maximum load. An annular channel 8 is formed in the base of the wheel, and within this channel is

fitted an annular bearing 9, of hardened steel, having thereon lugs or projections 10, which fit into sockets or depressions in the base of the channel and prevent the bearing from slipping around in the channel. A similar bearing 9^a is located in a channel 8^a in the bottom of the recess 1 in the standard. Raceways 11 are formed in the adjacent faces of the bearings, the walls 12 and 13 of each raceway being at right angles to one another and at an angle of about forty-five degrees to the plane of rotation of the wheel. The balls therefore touch the corresponding walls of both raceways at points in vertical lines at opposite sides of the vertical diameters of the balls. The balls are thus caused to roll positively in the raceways upon axes radial to the wheel, and the weight is applied to the balls in such manner as to enable them to withstand great pressure without crushing.

Within an enlarged portion 2^a of the opening 2 is arranged a receptacle D for lubricating material, this receptacle consisting of a cup or cylinder d, which surrounds the screw and has a threaded connection with the walls of said opening, said cylinder being closed at its lower end and open at its upper end. An annular recess or socket 2^b is formed in the bottom of the standard, surrounding the vertical opening and forming therewith a shoulder 14. The lower end of the receptacle is enlarged, forming a circular head 15, which fits into the socket 2^b, and between said head and the shoulder 14 is arranged a gasket 16, which effectually prevents the escape of oil or other lubricant which may leak down around the receptacle. The head 15 of the receptacle lies flush with the bottom of the standard and serves as a part of the base of the standard.

A pin b extends diametrically through the lower end of the lifting-screw, and its projecting ends form stops which engage the shoulder 14^b and limit the upward movement of the screw.

The interior of the standard or casing is rendered as nearly as possible dust-proof by means of a cover-plate 17, which extends over the wall of the annular recess 1, and a gasket 18, arranged beneath the plate.

The worm-wheel is operated by means of a worm 19 upon a horizontal worm-shaft 20, which latter is journaled in ball-bearings E and F, arranged in the standard or casing of the jack, and may be rotated in either direction by means of ratchet mechanism G, operating upon a ratchet-wheel H. The ball-bearing E comprises a sleeve 21, threaded onto one end of the shaft 20 and having an annular ball-raceway 22 therein, within which the steel balls 23 are arranged. A ball-retainer 24 is secured to the inner end of the sleeve and adapted to hold the balls in place when the shaft is removed. The balls bear against the interior face of a sleeve 25, which is screwed into a threaded recess in the casing and abuts against a shoulder 26. The interior wall of the sleeve 25 converges toward its outer end. The parts of the bearing F are the same in construction as the parts of the bearing E; but the outer sleeve 25^a of the bearing F instead of abutting against a shoulder which would limit its movement may be adjusted longitudinally of the shaft to compensate for wear, and it is provided with a lock-nut 27, which secures the sleeve in its adjusted position. When it is desired to remove the shaft, it is simply necessary to unscrew the nut 27 and the sleeve 25^a, when the shaft may be taken out, the balls being held in place by the ball-retainers. The latter, it may be noted, do not come in contact with the balls when the shaft is in position. The ratchet-wheel, as shown in Fig. 5, has a polygonal opening in the center, through which a correspondingly-shaped end portion of the shaft extends. The ratchet lever or handle 28 is provided with forked arms 28^a and 28^b, which are journaled on the shaft at opposite sides of the ratchet-wheel, and the lever and ratchet-wheel are held against end-wise movement upon the shaft between a shoulder 29 and a cotter-pin 30 or other suitable retaining devices. A ratchet mechanism G, comprising a slide 33 and a pawl 37, pivoted thereto, is arranged within vertical and horizontal guide-slots 31 and 32, which intersect one another in the ratchet-lever near its inner end. The slide 33 is arranged within the vertical slot 31. This slide has two parallel arms 34, and a pin or shaft 35 extends through and is journaled in said arms. A knob or handle 36 is secured upon one end of said shaft. The pawl 37 is removably secured to said shaft between the arms of the slide and within the guide-slot 32. The pawl is wide enough to extend across the slot 31, so that the pawl serves as a guide for the slide 33 and prevents lateral displacement of the slide. The pawl and slide may be removed by unfastening the pawl from the shaft 35 and removing the latter. The shaft 35 extends through the center of the pawl, and the ends of the pawl are provided with cam-faces 38, sloping in opposite directions, the opposite sides 39 of each end being straight. The cam is normally

pressed into engagement with the ratchet by a spring 40, arranged at the rear of the slide. It will be evident that when the ratchet-lever is turned in one direction the straight side of the pawl will engage the teeth of the ratchet-wheel and turn the latter, while when the lever is moved in the opposite direction the pawl will slip over the teeth on the ratchet-wheel. In order to reverse the direction of movement of the ratchet-wheel, it is merely necessary to reverse the position of the pawl by giving the knob 36 a semirevolution.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a lifting-jack, a standard or casing, a worm-wheel horizontally arranged within the casing, a lifting-screw extending centrally through the worm-wheel and having a threaded engagement therewith, a worm-shaft having thereon a worm engaging said worm-wheel, a ratchet-wheel secured to said shaft, and means for operating said ratchet-wheel comprising a lever journaled upon the shaft, a slide carried by said lever, a spring normally pressing said slide toward the ratchet-wheel, and a centrally-pivoted pawl carried by said slide and having its opposite ends suitably formed to engage and move the ratchet-wheel in opposite directions.

2. In a lifting-jack, a standard or casing, a worm-wheel horizontally arranged within the casing, a lifting-screw extending centrally through the worm-wheel and having a threaded engagement therewith, a worm-shaft having a worm engaging said worm-wheel, a ratchet-wheel secured to said shaft, and means for operating said ratchet-wheel comprising a lever journaled upon the worm-shaft, said lever having intersecting slots near its inner end, a slide in one of said slots, a pawl arranged in the other slot and pivotally connected to said slide, and a spring normally pressing said slide toward the ratchet-wheel.

3. In a lifting-jack, a standard or casing, a worm-wheel horizontally arranged within the casing, a lifting-screw extending centrally through the worm-wheel and having a threaded engagement therewith, a worm-shaft having a worm thereon engaging said worm-wheel, a ratchet-wheel secured to said shaft, and means for operating said ratchet-wheel comprising a lever having forked arms journaled upon the shaft at opposite sides of the ratchet-wheel, said lever having intersecting slots near its inner end, a slide in one of said slots, a pawl in the other slot and pivotally connected to said slide, and a spring normally pressing said slide toward the ratchet-wheel.

4. In a lifting-jack, a standard or casing, a worm-wheel horizontally arranged within the casing, a lifting-screw extending centrally through the worm-wheel and having a threaded engagement therewith, a worm-shaft having a worm engaging said worm-wheel, a

ratchet-wheel secured to said shaft, and means for operating said ratchet-wheel comprising a lever journaled upon the worm-shaft, said lever having intersecting slots near its inner end, a slide arranged in one of said slots and having forked arms, a shaft or pin journaled in said forked arms, a reversible pawl arranged in the other of said slots and secured to said pin, and a spring normally pressing said slide toward the ratchet-wheel.

5. In a lifting-jack, a base or standard having an opening extending therethrough, and a socket at each end of said opening, a worm-wheel arranged in the upper socket, a lifting-screw extending through and supported by said worm-wheel, and a lubricating cup or receptacle extending upwardly into said opening from the base of the standard and surrounding the lower part of the screw, said receptacle having a head at its lower end fitting into the lower socket in the standard.

6. In a lifting-jack, a base or standard having an opening extending therethrough and a socket at each end of said opening, a worm-wheel arranged in the upper socket, a cover-plate extending over said socket, a lifting-screw extending through and supported by said worm-wheel, and a lubricating cup or receptacle extending upwardly into said opening from the base of the standard and surrounding the lower part of the screw, said receptacle having a head at its lower end fitting into the lower socket in the standard.

7. In a lifting-jack, a standard or casing having a vertical opening, a lifting-screw vertically arranged in said standard, a horizontally-arranged wheel supporting said screw and having a threaded connection therewith, said wheel being rotatable about the screw and having an annular ball-raceway on its lower side, said standard also having an opposing ball-raceway, and balls within said raceways, the walls of each of said raceways being ar-

ranged to engage the balls at two points on opposite sides of their vertical diameters. 45

8. In a lifting-jack, a standard or casing having a socket in its upper end, an annular groove or channel in the base of said socket and a vertical opening extending downwardly from said socket, a wheel arranged within said socket and having an annular groove in its lower face, a lifting-screw extending through the hub of said wheel, said wheel being rotatable on the screw, annular bearings arranged within the channels of the wheel and socket, said bearings having raceways, the walls of which are arranged substantially at right angles to one another, and balls arranged within said raceways. 50

9. In a lifting-jack, the combination with the base or standard, the lifting-screw and the worm-wheel threaded upon said screw, of a worm-shaft having a worm engaging said wheel, and ball-bearings for said worm-shaft comprising sleeves secured to the shaft at opposite ends of the worm and having annular grooves therein, balls in said grooves, ball-retainers secured to the sleeves and adapted to hold the balls in place, tapering sleeves or shells fitting into suitable openings in the standard and extending around the balls, one of said tapering sleeves being fixed in position and the other sleeve being adjustable, and a locking-nut upon said latter sleeve. 55 60 65 70

In testimony whereof we affix our signatures in presence of two witnesses. 75

MARTIN V. H. PERKINS.

GEORGE Y. PATTERSON.

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