G. O. LEOPOLD.

LIFTING JACK.

APPLICATION FILED NOV. 29, 1920.

1,395,123. **Patented Oct. 25, 1921.**

2 SHEETS—SHEET 1.

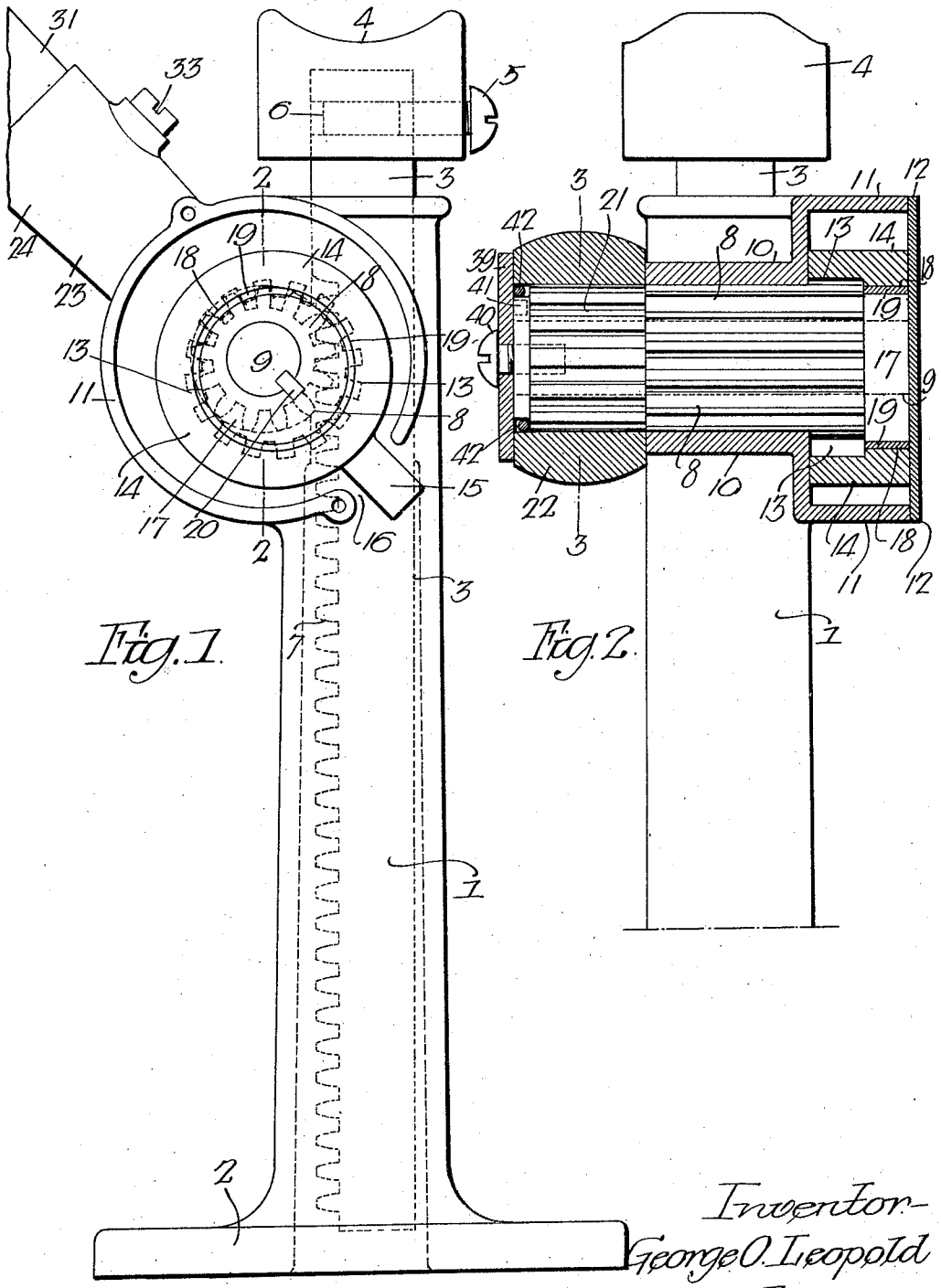


Fig. 1.

Fig. 2.

Inventor-
George O. Leopold
by his Attorneys
Howson & Howson

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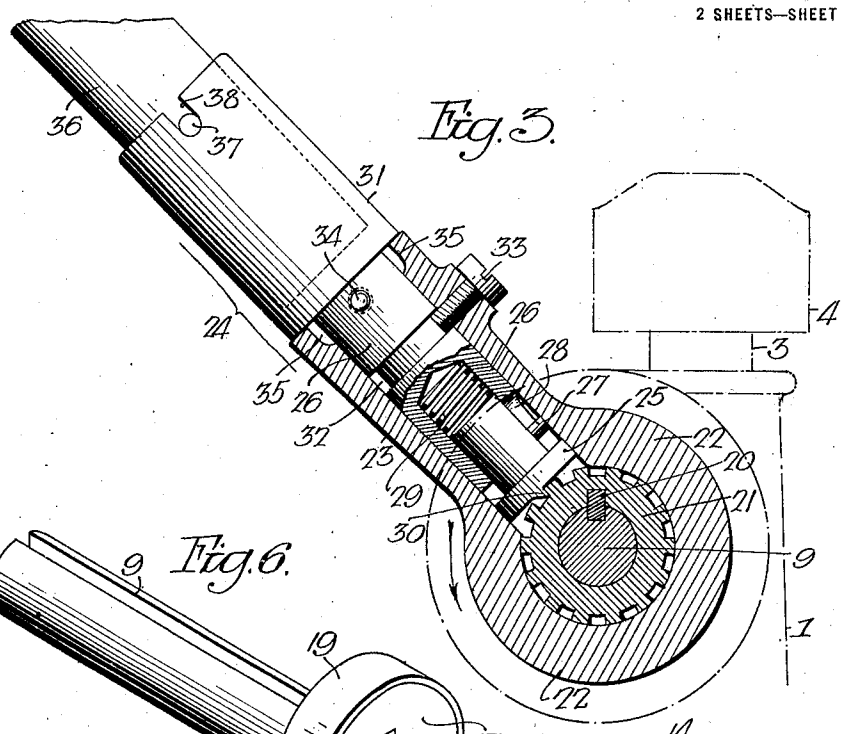


Fig. 3.

Fig. 6.

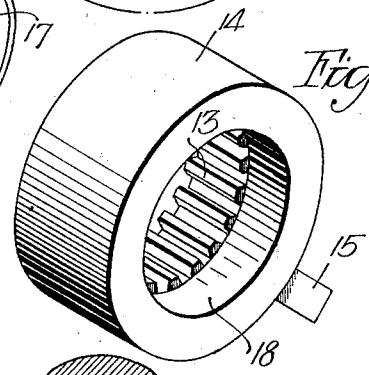


Fig. 7.

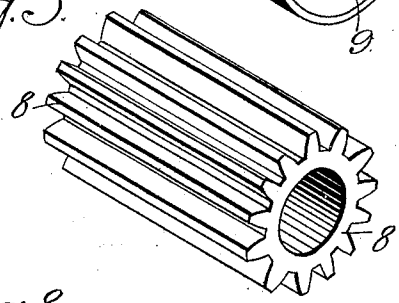


Fig. 5.

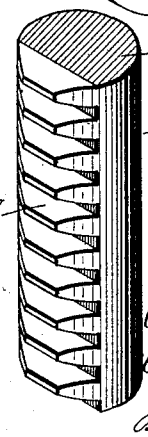


Fig. 4.

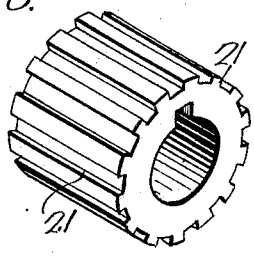


Fig. 8.

Inventor—
George O. Leopold
by his Attorneys
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UNITED STATES PATENT OFFICE.

GEORGE O. LEOPOLD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO NORTH BROS. MF'G. CO., OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

LIFTING-JACK.

1,395,123. Specification of Letters Patent. Patented Oct. 25, 1921.

Application filed November 29, 1920. Serial No. 427,009.

To all whom it may concern:

Be it known that I, GEORGE O. LEOPOLD, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented Lifting-Jacks, of which the following is a specification.

One object of my invention is to construct a substantial and easily operated lifting jack which will hold a load at any point desired without the use of pawls.

A further object of the invention is to provide a jack that can be reversed by turning the operating handle.

These objects I attain in the following manner, reference being had to the accompanying drawings, in which,

Figure 1 is a side view of my improved jack;

Fig. 2 is a sectional view on the line 2—2, Fig. 1;

Fig. 3 is a sectional view on the line 3—3, Fig. 2; and

Figs. 4 to 8 inclusive are perspective views illustrating details of the invention.

1 is the standard of the jack having a base 2. This standard is hollow and movable vertically in the standard is the plunger 3 carrying at its upper end a head 4 recessed to fit an axle of an automobile, or other device to be raised. In the present instance, this head can turn on the plunger, being held to the plunger by a screw 5 which extends into an annular recess 6 in the plunger.

In one face of the plunger are teeth 7 shown in detail in Fig. 4 and these teeth engage a long pinion 8 Fig. 5 loose on a shaft 9, Fig. 6. The pinion 8 is located in a casing 10 which is enlarged at 11 and provided with a detachable cap 12 and the long pinion 8 extends into this enlargement as shown in Fig. 2 and the teeth of the pinion mesh with internal teeth 13 on a sleeve 14 which is eccentric to the shaft 9 and this sleeve has a projection 15 adapted to a slot 16 in the enlargement 11 of the casing so that it has a limited movement to justify itself in respect to the pinion 8. On the shaft 9 is an eccentric 17 adapted to a portion 18 of the sleeve 14 and in the present instance between the eccentric and sleeve is a ring 19 of bronze or other suitable material.. The eccentric 17 is secured to the shaft by a key 20. Keyed to the opposite end of the shaft is a ratchet wheel 21, Fig. 8, through which the shaft 9 and its eccentric are turned. 22 is a hub that fits on the ratchet wheel as shown in Fig. 3 and this hub has an extension 23 forming part of the handle 24 and in this extension is a pawl 25 fitting in a socket 26. A pin 27 on the pawl 25 is adapted to a slot 28 in the socket so that the pawl cannot turn independently of the socket.

Back of the pawl is a spring 29 tending to move the pawl forward. On the head of the pawl is a tooth 30 which engages the teeth of the ratchet wheel 21 as shown clearly in Fig. 3. When the pawl is in the position illustrated in Fig. 3 the hub can move in the direction of the arrow without turning the ratchet wheel and shaft 9 but when the movement is reversed the tooth 30 will engage the teeth of the ratchet wheel and turn the ratchet wheel, the shaft and the gearing and will move the plunger in one direction.

In order to reverse the movement of the plunger I so construct the socket member 26 that it will turn in the portion 23, the socket member forming part of the extension 31 which forms a continuation of the handle and this socket member is grooved at 32 to receive a screw 33 which prevents the socket member moving longitudinally. Carried by the socket member is a ball 34 which is adapted to enter either of two recesses 35 in the portion 23. When the ball is in one recess the tooth 30 faces in one direction and when the handle member is turned a half turn the ball moves into another recess so as to lock the tooth 30 in an opposite position. The ball has a spring back of it in the present instance to move it forward in the socket. Other means than the ball may be used for locking the handle in its two positions without departing from the essential features of the invention.

The extension 31 has a tapered recess adapted to receive the tapered end of a wooden or metal handle portion 36, and this portion has a pin 37 adapted to a slot 38 in the extension 31 so that on turning this handle portion the pawl can be turned to cause the plunger 3 to be raised or lowered and by having the pin adapted to the slot this handle section can be removed to allow the jack to be packed into a comparatively small space.

It will be seen that by the above construction I dispense entirely with any form of pawl for holding the plunger in the load sustaining position and this is accomplished

by the heavy parts consisting of a pinion, a sleeve and the eccentric mounted on the shaft, the pawl which is attached to the handle forming no part of the mechanism employed in supporting the plunger and the load. The hub 22 in the present instance is held to the shaft 9 by a disk 39 and a screw 40. The disk has a projection 41 adapted to a notch in the hub of the ratchet wheel and a spring 42 acts to place sufficient friction on the ratchet wheel to prevent it moving as the handle is returned after operating the mechanism in one direction. Access may be readily had to the eccentric and sleeve by removing the plate 12 which is held to the extension 11 by screws or other fasteners.

It will be understood that a different form of head may be used from that shown, depending upon the use for which the jack is intended and the general contour of the jack may be modified as desired. While I have shown the pinion as an integral long pinion, it may be made in two parts connected together without departing from the essential features of the invention and the two parts may be of different diameters.

I claim:

1. The combination in a lifting jack of a standard; a toothed plunger mounted in the standard; a pinion mounted in the standard, the teeth of the pinion meshing with the teeth of the plunger; a sleeve having internal teeth engaging the pinion; means for limiting the movement of the sleeve; a shaft extending through the pinion and sleeve; an eccentric on the shaft adapted to the sleeve; and means for turning the shaft.

2. The combination in a lifting jack of a standard; a casing on the standard; a plunger vertically movable in the standard and having teeth; a pinion mounted in the casing of the standard, the teeth of the pinion meshing with the teeth of the plunger; an eccentric sleeve having internal teeth adapted to the teeth of the pinion; and means for limiting the movement of the sleeve; a shaft free to turn in the pinion; and an eccentric on the shaft adapted to the sleeve so that the sleeve is eccentric in respect to the pinion; and means for turning the shaft to raise or lower the plunger.

3. The combination of a standard having a casing forming an integral part thereof, said casing being enlarged at one side; a toothed plunger mounted vertically in the standard; a long pinion having its bearings in the casing, the teeth of the pinion meshing with the teeth of the plunger, one portion of the pinion extending into the enlargement of the casing; a sleeve mounted in the enlargement of the casing and having a projection, the casing being slotted for the passage of the projection, the sleeve having internal gear teeth meshing with that portion of the pinion extending into the enlargement; a shaft loosely mounted within the long pinion; and an eccentric mounted in the end of the shaft and adapted to an opening in the sleeve beyond the pinion; and means for turning the shaft in either direction to raise or lower the plunger.

4. The combination in a lifting jack of a standard having a casing; a pinion mounted within the casing; a plunger having teeth at one edge engaging the teeth of the pinion; a sleeve having internal teeth meshing with the teeth of the pinion; means for limiting the rotative movement of the sleeve; a shaft extending freely through the pinion and an eccentric on the shaft located in the sleeve; a ratchet wheel secured to the opposite end of the shaft; a hub on said ratchet wheel; an extension of the hub forming the handle and a socket member mounted to turn in this extension; a ball carried by said socket member; and a detachable section forming part of the handle mounted in the socket member, said socket member being turned to reverse the ball.

GEORGE O. LEOPOLD.