G. O. LEOPOLD.

RATCHET MECHANISM.

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1,286,360.

Patented Dec. 3, 1918.

Fig 1.

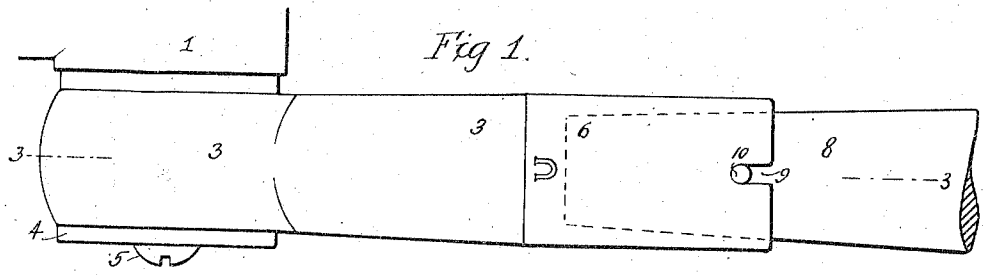


Fig. 2.

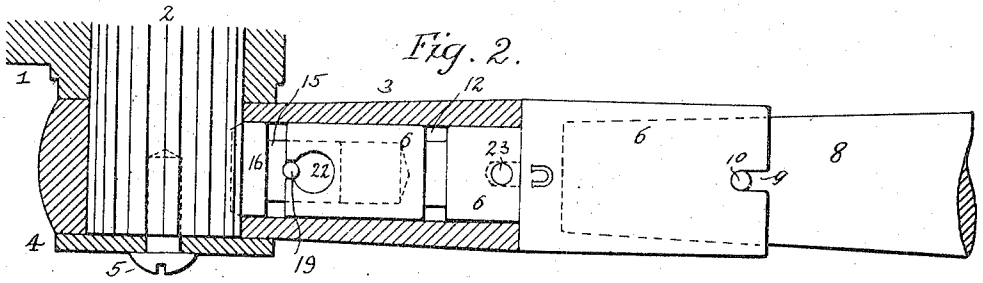


Fig. 3.

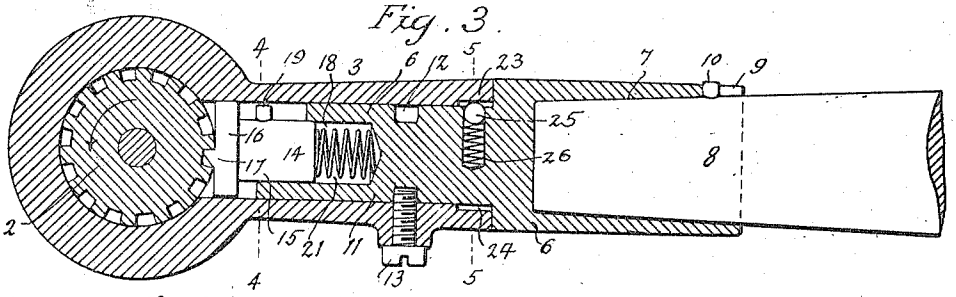


Fig 4.

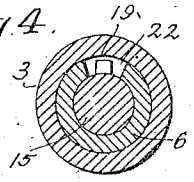


Fig. 5.

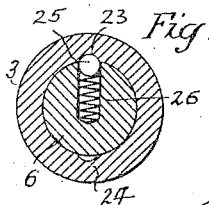


Fig. 6.

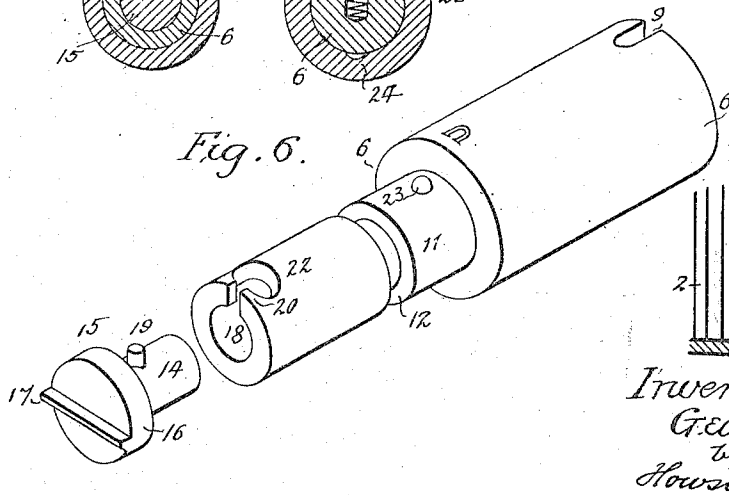
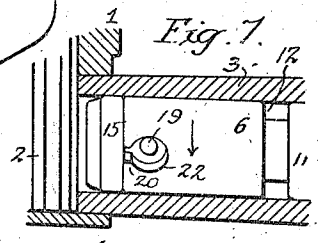


Fig. 7.



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UNITED STATES PATENT OFFICE.

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RATCHET MECHANISM.

1,286,360. Specification of Letters Patent. Patented Dec. 3, 1918.

Application filed January 2, 1918. Serial No. 209,861.

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 certain Improvements in Ratchet Mechanism, of which the following is a specification.

My invention relates to certain improvements in ratchet mechanism used in connection with lifting jacks, or other tools, in which a shaft is to be turned in either direction by reciprocating an arm.

The object of my invention is to make the ratchet mechanism so that the pawl can be shifted to either of its two positions and can be frictionally held in either position.

The invention also relates to means for withdrawing the pawl and holding it out of contact with the ratchet wheel while it is being reversed.

In the accompanying drawings:

Figure 1 is a plan view showing my improved ratchet mechanism;

Fig. 2 is a plan view partly in section;

Fig. 3 is a longitudinal sectional view on the line 3—3, Fig. 1;

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

Fig. 5 is a transverse sectional view on the line 5—5, Fig. 3;

Fig. 6 is a detached perspective view of the pawl carrier and the pawl; and

Fig. 7 is a longitudinal sectional view showing the pawl carrier and pawl in the act of being turned to reverse the movement.

Referring to the drawings, 1 is the bearing. 2 is a ratchet wheel having teeth, as clearly shown in the drawing. This wheel is mounted in the bearing and may be connected to any mechanism which is required to be turned in either direction, such as a lifting jack, but it will be understood that the device can be used in connection with any mechanism requiring a ratchet device. 3 is the casing, which is mounted on the ratchet wheel 2 and is held against the bearing by a washer 4 and a screw 5, in the present instance. Mounted in the casing is a carrier 6, as clearly shown in detail in Fig. 6, having a socket 7 for the end of a handle 8. The carrier is notched at 9 to receive a pin 10 so as to prevent the handle from turning in the socket. The carrier 6 has a reduced portion 11, which has an annular groove 12 therein adapted to receive the end of a screw pin 13 located in an opening in the casing 3 so as to prevent the withdrawal of the carrier from the casing. In the inner end of the carrier is a cylindrical socket 18 adapted to receive the spindle 14 of the pawl 15. The pawl has a head 16 in the form of a disk which fits the opening in the casing 3 and has a transverse tooth 17 arranged to engage the teeth of the ratchet wheel 2. The tooth is straight on one side and is beveled on the opposite side and can be turned to the position shown in Fig. 1 to ratchet the wheel 2 in the direction of the arrow, Fig. 3, or it can be reversed so as to ratchet the wheel in the opposite direction. On the spindle 14 of the pawl 15 is a pin 19, which extends into the slot 20 in the carrier so as to prevent the pawl from turning independently of the carrier. Located back of the spindle in the socket 18 is a spring 21, which tends to force the pawl out against the ratchet wheel, and when the pawl is in its normal position the pin 19 is in the narrow portion of the slot 20, as clearly shown in Fig. 2, but when the pawl is pressed back against the spring, which occurs when the pawl is turned into either of its two positions, the pin moves into the enlarged portion 22 of the slot, as indicated in Fig. 7. The walls of this enlarged portion are curved, or inclined, so that the tendency is to hold the pawl in the retracted position, while the carrier is being turned.

In order to frictionally lock the carrier in either of its two positions, I form two notches in the interior of the casing, as at 23 and 24, Figs. 3 and 5, and mounted in a socket in the carrier is a ball 25, held in its projected position by a spring 26. The outer end of the socket is slightly contracted so as to prevent the ball from becoming detached when the carrier is removed from the casing. Suitable indicating marks, such as the letters "U" and "D" are formed on the enlarged portion of the carrier so as to indicate when the pawl is in the position to ratchet the lifting jack upward or downward.

When the parts are in the position shown in Fig. 3, the ball 25 extends into the notch 23 in the casing and the pawl is in engagement with the ratchet wheel 2 so that when the carrier is forced down by bearing upon the handle 8, the spring allows the pawl to ratchet over the teeth of the wheel 2 and

when the handle is raised the pawl engages the teeth of the wheel and turns it in the direction of the arrow, Fig. 2.

When it is desired to reverse the direction, the carrier is turned in the casing, the ball 25 being forced into the socket and when the ball 25 is opposite the socket 24 it drops into position and this movement first withdraws the pawl 15 by the inclined portion of the teeth 17 bearing against the teeth of the ratchet wheel, which forces the pin 19 of the pawl into the enlarged portion 22 of the slot in the carrier so that as the carrier is turned the pin is held in the enlarged portion of the slot by the inclined walls of the slot so that the pawl is clear of the ratchet wheel, thus allowing the carrier to be turned freely from one position to the other, but as soon as the carrier is in position for the balls 25 to enter the notch 24 in the casing, the pawl will be projected in position to ratchet the wheel 2 in the opposite direction to the arrow, Fig. 3.

I claim:

1. The combination in ratchet mechanism, of a ratchet wheel; a pivotally mounted casing; a carrier mounted in the casing; a pawl having a tooth arranged to engage the teeth in the ratchet wheel; a spring back of the pawl; means for preventing the pawl from turning in the carrier when the handle is reciprocated, said means withdrawing the pawl from engagement with the ratchet teeth when the carrier is turned in the casing to reverse the position of the pawl.

2. The combination in ratchet mechanism, of a ratchet wheel; a casing mounted on the wheel; a carrier located in the casing; a handle attached to the carrier, said carrier having a socket; a headed pawl having a spindle adapted to the socket; a spring located in the socket back of the pawl, the pawl having a transverse tooth arranged to engage the teeth of the ratchet wheel; a longitudinal slot in the carrier; and a pin on the spindle of the pawl adapted to the slot so that when the carrier is turned the pawl will yield and the tooth of the pawl will ride over the teeth of the ratchet wheel.

3. The combination of a ratchet wheel; a casing mounted on the ratchet wheel; a carrier located in the casing and having a socket; a pawl having a cylindrical head and a cylindrical spindle, said spindle being located in the socket in the carrier; a spring in the socket back of the pawl, said pawl having a transverse tooth arranged to enter the teeth of the ratchet wheel, the carrier having a slot; a pin on the spindle of the pawl arranged to enter the slot, said slot being enlarged and having inclined walls so that when the pawl is pushed in, on turning the carrier, the pin will enter the enlarged portion of the slot, and, on continuing the turning, the pawl will be held in the retracted position against the pressure of the spring so that the carrier and the pawl can be freely turned into either of its two positions.

4. The combination in ratchet mechanism, of a ratchet wheel; a bearing in which the wheel is mounted; a casing mounted to turn freely on the ratchet wheel, said casing having a cylindrical chamber therein; a carrier having a cylindrical reduced portion adapted to the chamber in the casing; means for holding the carrier against longitudinal movement, the casing having two internal notches; a spring-pressed ball in the carrier adapted to enter either one of the notches, a carrier having a socket in its inner end and having a slot communicating with the socket, said slot being enlarged at its inner end; a pawl having a spindle mounted in the socket and having a head adapted to the cylindrical chamber in the casing; a pin on the spindle arranged to fit the narrow portion of the notch when the pawl is projected and arranged to enter the enlarged portion of the notch when the pawl is forced in, on turning the carrier.

In witness whereof I affix my signature.

GEORGE O. LEOPOLD.

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