

May 6, 1924.

G. O. LEOPOLD

1,493,353

RATCHET TOOL

Filed July 7, 1922

2 Sheets-Sheet 1

Fig. 1.

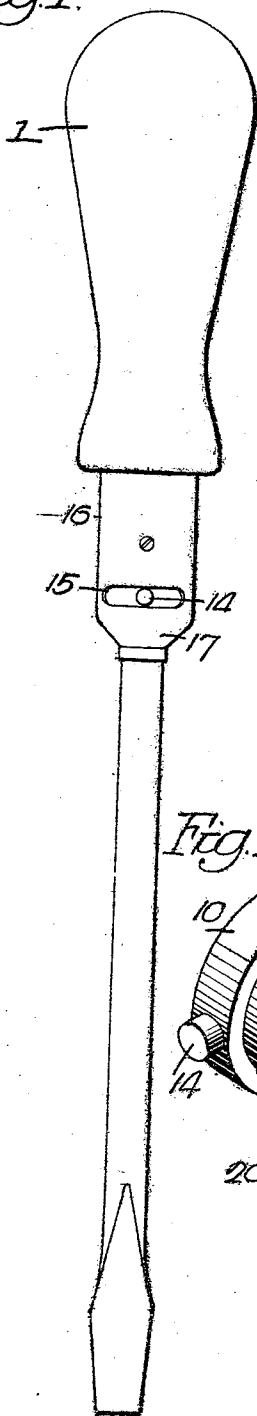


Fig. 2.

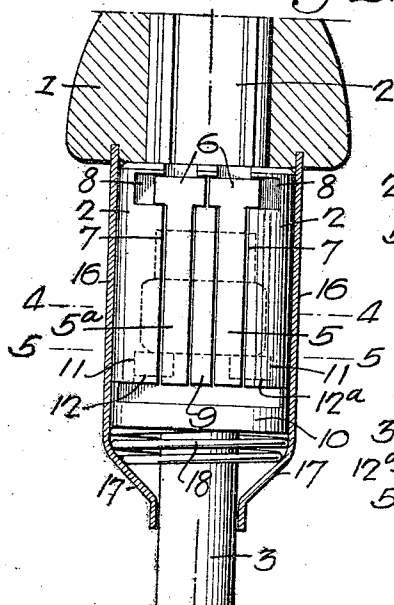


Fig. 4.

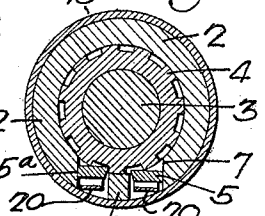


Fig. 5.

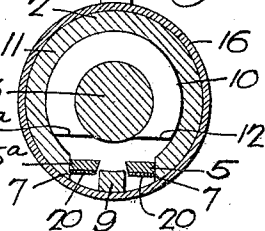


Fig. 8.

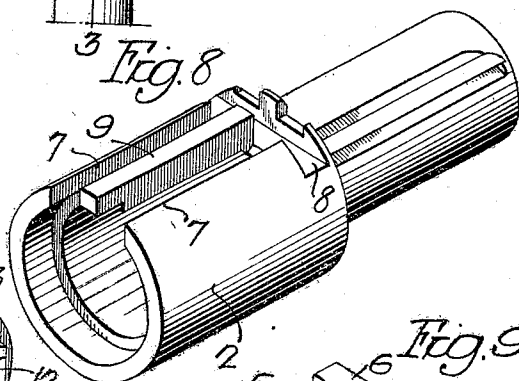


Fig. 10.

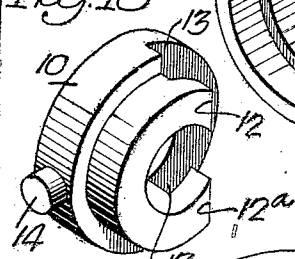


Fig. 9.

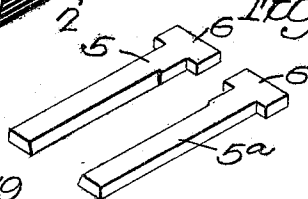
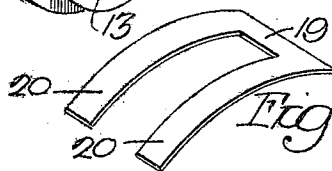


Fig. 11.



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

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Fig. 3.

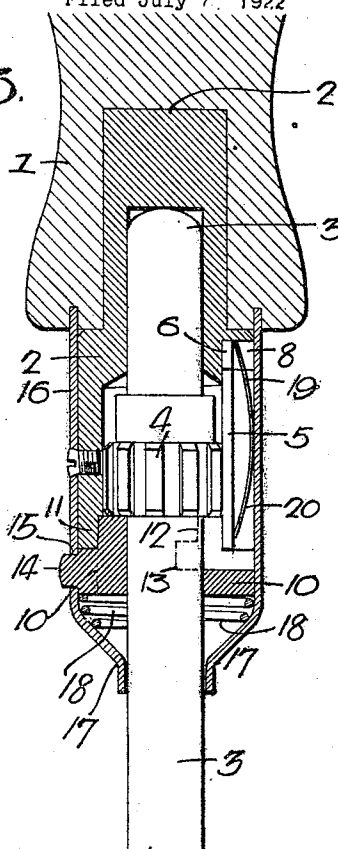


Fig. 6.

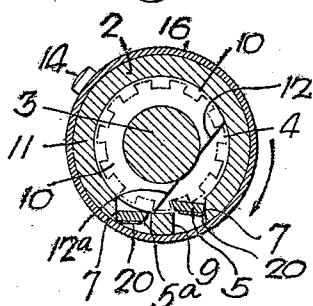
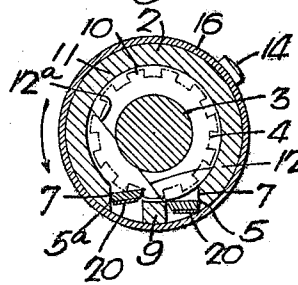


Fig. 7.



Inventor—
George O. Leopold.
by his Attorneys—
Hosmer & Hosmer

UNITED STATES PATENT OFFICE.

GEORGE O. LEOPOLD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO NORTH
BRO'S M'FG CO., OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENN-
SYLVANIA.

RATCHET TOOL.

Application filed July 7, 1922. Serial No. 573,421.

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 Tools, of which the following is a specification.

The object of my invention is to simplify the construction of ratchet screw drivers, drills and other tools in which it is desired to turn the spindle either to the right or to the left on reciprocating the handle, or to lock the spindle to the handle.

In the accompanying drawings:

Fig. 1 is a view of a screw driver equipped with my improved ratchet mechanism;

Fig. 2 is an enlarged view, the handle and shell being in section to illustrate the ratchet mechanism;

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

Fig. 4 is a transverse sectional view on the line 4—4, Fig. 2, showing both pawls in engagement with the ratchet wheel;

Fig. 5 is a transverse sectional view on the line 5—5, Fig. 2;

Fig. 6 is a sectional view showing the right hand pawl in engagement with the ratchet wheel and the left hand pawl raised clear of the wheel;

Fig. 7 is a view similar to Fig. 6 showing the left hand pawl in engagement with the ratchet wheel and the other pawl raised;

Fig. 8 is a detached perspective view of the body portion;

Fig. 9 is a detached perspective view of the two pawls;

Fig. 10 is a detached perspective view of the shifter; and

Fig. 11 is a detached perspective view of the pawl spring.

1 is a handle. 2 is a body portion having an extension fitting an opening in the handle and ribbed to prevent the handle turning on the extension. The body portion has an opening for the reception of the spindle 3. This opening is enlarged to accommodate the ratchet wheel 4, which is secured to the spindle. The body portion has two longitudinal slots, separated by a tongue 9. The outer walls of the slots form abutments for the pawls. A transverse slot 8 at the inner end of the longitudinal slots is shaped to receive the heads of the pawls. The tongue 9 holds the pawls in proper alignment laterally.

5 and 5^a are pawls made as clearly shown

in Fig. 9. Each pawl has a T-head 6 and is beveled at one side to engage the undercut teeth of the ratchet wheel 4, and is shaped to fit the abutments 7 on the body portion 2.

10 is a rotary shifter for the pawls. The shifter has a reduced portion 11, which is located in the end of the opening in the body portion so as to extend under the ends of the pawls, as clearly shown in Fig. 2. The reduced portion is cut away at one side to form shoulders 12 and 12^a, which act upon the ends of the pawls to lift either one out of engagement with the ratchet wheel. The shifter is grooved at 13 at one side of the shoulders 12 and 12^a to allow clearance for the free movement of the pawls.

14 is a stud formed integral with the shifter. This stud projects through a slot 15 in a shell 16, which encloses the ratchet mechanism. This shell is reduced at 17 so as to fit the spindle 3. Between the reduced portion of the shell and the shifter is a coiled spring 18, which tends to keep the shifter in contact with the end of the body portion 2, placing sufficient friction on the shifter to retain it in the position in which it has been adjusted.

19 is a U-shaped spring having tongues 20, which rest upon the pawls 5 and 5^a. The cross member of the spring is located in the slot 8, as clearly shown in Fig. 3. This spring tends to hold the pawls yieldingly in engagement with the ratchet wheel and will yield when the pawls are forced out of engagement by the shifter 10.

The operation is as follows: When the parts are in the position illustrated in Figs. 4 and 5, the pawls 5 and 5^a are in engagement with the ratchet wheel 4—locking the spindle to the handle. When the parts are in this position, the tool can be used as an ordinary tool, in which the spindle is rigidly attached to the handle.

When the shifter is turned to the position illustrated in Fig. 6, the pawl 5^a is moved out of engagement with the ratchet wheel 4, while the pawl 5 remains in engagement with the wheel. Consequently, when the handle is turned, the pawl moves the spindle in the direction of the arrow, Fig. 6, and, when the handle is returned, the pawl yields, allowing the spindle to remain in a stationary position.

When the shifter is moved to the position shown in Fig. 7, the pawl 5 is with-

drawn from engagement with the ratchet teeth and the pawl 5^a is allowed to engage the ratchet wheel so that, when the handle is moved in the direction of the arrow, the reverse from that shown in Fig. 6, the spindle is moved in the same direction, and, when the movement of the handle is reversed, the spindle remains stationary.

I claim:

1. The combination in a ratchet tool, of a handle; a body portion mounted in the handle; a spindle extending into the body portion; a ratchet wheel on the spindle; two pawls mounted longitudinally side by side in the body portion and arranged to engage the teeth of the ratchet wheel; and a rotary shifter located at the end of the body portion and extending under the ends of the pawls so that, when the shifter is rotated, either one of the pawls will be moved out of engagement with the ratchet wheel.

2. The combination in a ratchet tool, of a handle; a body portion secured to the handle, said body portion having an opening therein; a spindle having its bearings in the opening; a ratchet wheel secured to the spindle and having a series of undercut teeth, the body portion having two longitudinal slots connected by a transverse slot; two T-headed pawls mounted in the slots, each of said pawls having one edge beveled to correspond with the bevel of the teeth of the ratchet wheel; a spring back of each pawl; and a shifter at the end of the body portion extending under the ends of the pawls, said shifter being cut away to form shoulders, which force either one

of the pawls out of engagement when the shifter is turned.

3. The combination in a ratchet tool, of a handle; a body portion secured to the handle, said body portion having a longitudinal opening and also having two longitudinal slots and a transverse slot at the inner end of the longitudinal slots, the longitudinal slots communicating with the opening; a spindle mounted in the opening; a ratchet wheel secured to the spindle; a pawl located in each longitudinal slot, each pawl having a T-head located in the transverse slot; a rotary shifter located at the end of the body portion and extending under the ends of the pawls; a spring back of the pawls; and a casing enclosing the movable parts and holding them in position.

4. The combination in a ratchet tool, of a body portion having a longitudinal opening; a spindle mounted in said opening; a ratchet wheel on the spindle; two pawls mounted in the body portion and arranged to engage the teeth of the ratchet wheel; a spring back of said pawls; a shifter located at the end of the body portion and having a reduced portion extending into the end of the body portion, said reduced portion being cut away to form shoulders, which are arranged to lift either one of the pawls out of engagement with the ratchet wheel when the shifter is turned; a casing enclosing the parts; and a spring within the casing tending to hold the shifter yieldingly in contact with the body portion.

GEORGE O. LEOPOLD.