Jan. 15, 1929. 1,699,266

J. I. APPLESTINE

COMBINATION TOOL

Filed July 21, 1926

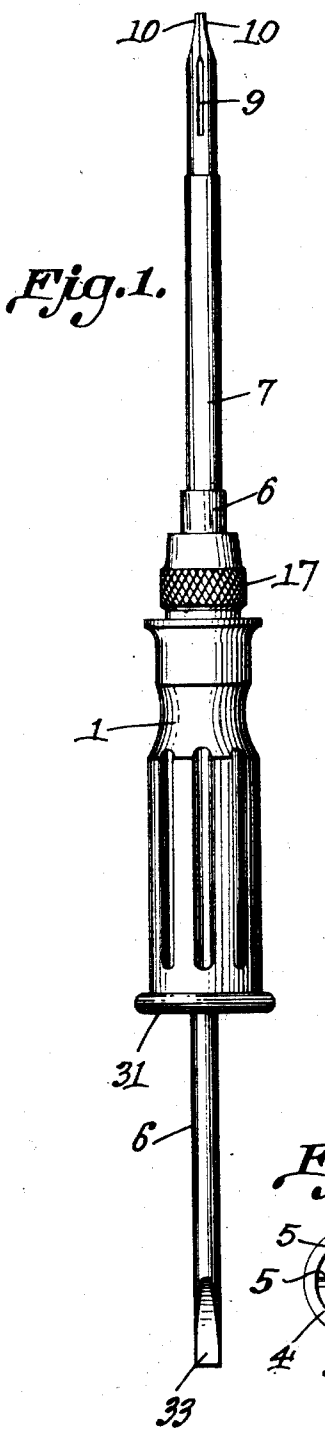


Fig. 1.

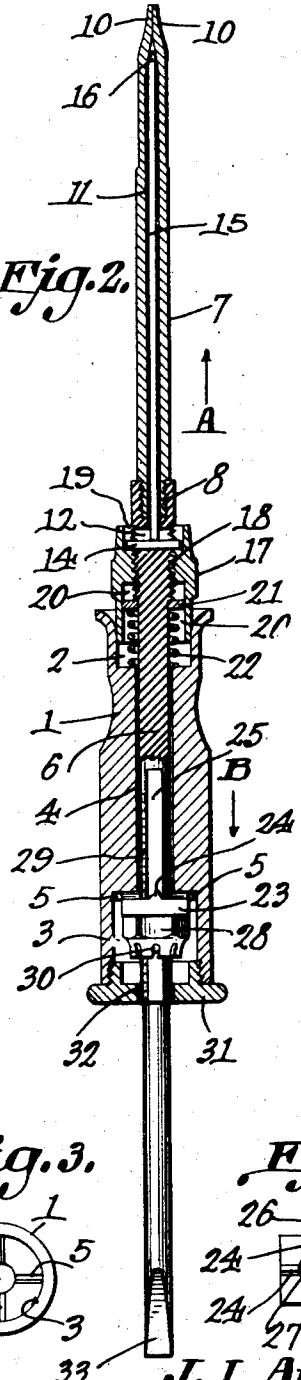


Fig. 2.

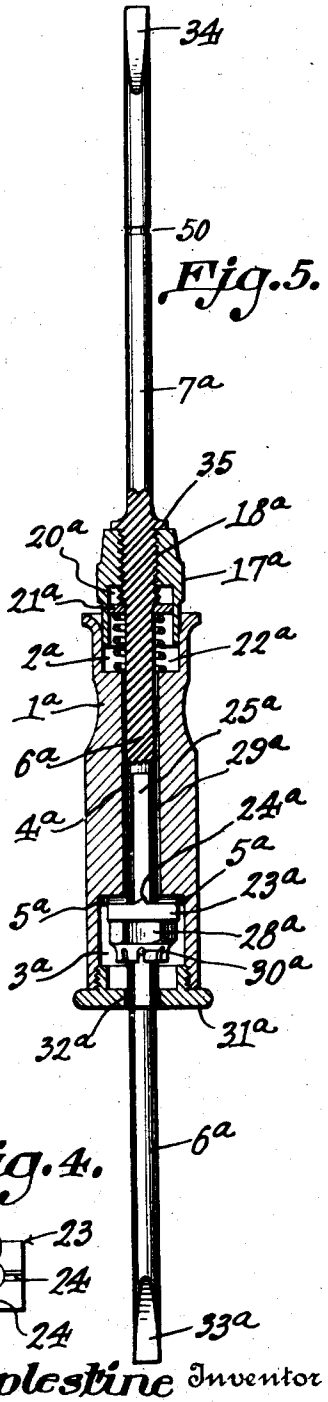


Fig. 5.

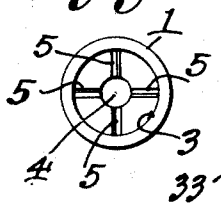


Fig. 3.

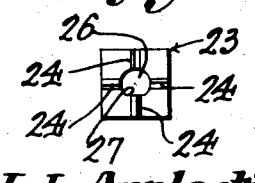


Fig. 4.

J. I. Applestine Inventor

By C. A. Snow & Co.

Attorneys

Patented Jan. 15, 1929. 1,699,266

UNITED STATES PATENT OFFICE.

JAMES I. APPLESTINE, OF ANNAPOLIS, MARYLAND.

COMBINATION TOOL.

Application filed July 21, 1926. Serial No. 123,905.

There is a class of tools known as screw setters, which are engaged with a kerf of a screw, to place or start the screw, as distinguished from turning the screw home to a seat. Mechanics sometimes use such a tool thoughtlessly, as a screw driver, and the tool is broken, because the somewhat delicate mechanism used to grip the screw in the kerf, will not abide the heavy torque to which a screw driver is subjected. The foregoing being understood, one object of the invention is so to construct the tool that, when an attempt is made to use it as a screw driver, the handle will slip and avoid a dangerous twisting pressure on the bit or part which engages the screw.

In a number of trades, glass is placed and set by means of screws, bolts and the like, and if too much twist is put on the screw driver, the glass is broken. This being understood, another object of the invention is to provide a screw driver, the handle of which will slip when a predetermined amount of force has been applied to it, thereby rendering the screw driver ineffective to turn the screw or bolt tightly enough to break the glass.

Another object of the invention is to combine a screw driver and a screw setter in a single compact, operative and inexpensive tool.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that sort to which the invention appertains.

I have shown preferred forms of my invention, but it is understood that those forms are presented for illustration merely, and that a mechanic, working within the scope of what is claimed, may make such changes as his skill may suggest, without departing from the spirit of the invention.

In the accompany drawings:—

Figure 1 shows in side elevation, a screw setter wherein the present improvements have been embodied;

Figure 2 is a longitudinal section of the structure shown in Figure 1;

Figure 3 is an end view of the handle;

Figure 4 is a plan of the ratchet nut;

Figure 5 is a view illustrating the device embodied in a screw driver.

In the form disclosed in Figures 1, 2, 3 and 4, there is shown a handle 1 having a recess 2 in its forward end, and a chamber 3 in its rear end, the chamber and the recess being connected by a reduced bore 4, there being radial seats 5 in the handle 1 at the base of the chamber 3. A stem 6 is located in the bore 4, and at times may rotate therein, the stem being provided with a bit 7 for engaging the kerf of a screw, the bit being threaded at 8 into the forward end of the stem 6. The bit 7 is slit to form thinned jaws 10. The bit 7 has a longitudinal passage 11 communicating with a transverse opening 12 in the stem 6, a cross pin 14 being located in the opening 12 and having transverse movement therein, the cross pin engaging the inner end of an expander rod 15, located in the passage 11, the expander rod having a tapered end 16 adapted to be advanced between the jaws 10.

A sleeve 17 is threaded at 18 for adjustment on the stem 6 and has a forward recess 19 in which the cross pin 14 is received; so that the cross pin cannot slide endwise out of the opening 12. The sleeve 17 has a rear recess 20 in which is located an abutment washer 21 disposed about the stem 6 and held against longitudinal movement in one direction by the threaded part of the stem. A compression spring 22 is located about the stem 6, one end of the compression spring bearing on the washer 21, and the other end of the compression spring bearing against the handle 1 at the base of the recess 2.

A ratchet member 23, in the form of a plate, is mounted on the stem 6 for adjustment therealong, and is placed in the chamber 3. Any means may be provided for connecting the ratchet member 23 with the stem 6, to rotate therewith. For instance, the stem 6 may have a flat side 25 adapted to engage the flattened portion 27 of the opening 26 in the ratchet member, the ratchet member being provided with ribs 24, adapted to cooperate with the seats 5 in the handle 1. A castle nut 28 is threaded at 29 on the stem 6 and constitutes means whereby relative longitudinal movement between the stem 6 and the handle 1 may be brought about, for a purpose to be mentioned hereinafter, the castle nut bearing against the ratchet member 23. A securing element 30 engages the castle nut 28 and the stem 6, and holds the castle nut against rotation.

A closure 31 is detachably mounted, by threading or otherwise, on one end of the handle 1, the closure having an opening 32 through which the stem 6 projects, the stem terminating in a screw driver bit 33.

When the tool is to be used as a screw setter, a small screw, sometimes is held between the jaws 10, but, more frequently, the jaws 10 are inserted into the kerf of the screw, and the sleeve 17 is rotated and advanced along the stem 6, the cross pin 14 being carried forward, and the expander 15 being advanced, so that its tapered end 16 will spread the jaws 10 and cause them to hold in the kerf of the screw. The screw, held as above described, may be placed wherever needed.

It has been stated by some, that many mechanics, after they have placed the screw, thoughtlessly continue to rotate the screw by means of the jaws 10, the bit 7 and the handle 1, the tool thus being converted into a screw driver. The tool is not adapted for promiscuous use of that kind, because the bit 7 and the jaws 10 are somewhat frail; and the result is that the jaws 10 are broken, twisted out of shape, or damaged otherwise.

In order to avoid the aforesaid damage to the jaws 10, and, indeed, to render the tool incapable of use as a screw driver, in the hand of a thoughtless person, the handle 1 is connected to the bit-stem 6 by what may be called a slip clutch. When the operator presses in the direction of the arrow A in Figure 2, as he must do when he attempts to use the tool as a screw driver, the spring 22 will be compressed somewhat, and the handle 1 will move in the direction of the arrow A, thus easing off a little on the interengaged elements 24 and 5 of the ratchet member 23 and the handle 1, respectively, the handle thus being permitted to rotate freely with respect to the stem 6, before torque enough is put on the bit 7 to twist the jaws 10 out of shape, or to break them. It is therefore practically impossible for an absent-minded mechanic to turn the tool into a screw driver.

When the real screw driver work is to be carried out, the operator turns the tool end for end, and uses the bit 33. Note that at this time, the pressure is in the direction of the arrow B in Figure 2, and the ribs 24 and the seats 5 are the more securely interengaged, so that independent rotation between the handle 1 and the bit 6 will not be likely to take place. The ribs 24 and the seats 5 are so pitched or sloped, as shown in Figure 2, that although the handle 1 can rotate somewhat readily with respect to the stem 6 when an attempt is made to use the jaws 10 for a screw driver, yet, when the bit 33 is used to advance the screw, relative rotation between the handle 1 and the stem 6 will be more difficult.

The compression spring 22 determines the strength of the engagement which exists between the ribs 24 and the seats 5. The effective effort of the spring 22 may be changed or adjusted by moving the stem 6 endwise in the handle 1. This is brought about by turning the castle nut 28 on the threaded part 29 of the stem 6, the castle nut being held in place, after adjustment, by the securing element 30.

In Figure 5, parts hereinbefore described have been designated by numerals previously used, with the suffix "a." The stem 6^a carries a bit 7^a which is constructed, as indicated at 34, for use as a screw driver, and not as a screw setter. The bit 7^a has a shoulder 35 against which the sleeve 17^a is threaded. This tool is adapted to be used in setting glass, or in other operations, in which too strong a torque will lead to trouble. Obviously, when the operator pushes the handle 1^a forward, in order to put too heavy a twist on the part 34 of the bit 7^a, the handle 1^a will turn with respect to the stem 6^a, as hereinbefore described in connection with the handle 1.

The bit, such as the bit 7^a, may be supplied with a circumferential groove or seat 50, used when supplemental tools (not shown) are mounted on the bit 7^a.

What is claimed is:—

1. A tool of the class described, comprising a stem provided at each end with means for engaging an article to be rotated, a handle on the stem, and interengaging slip clutch elements carried by the handle and by the stem, the handle being movable in one direction to weaken the engagement between said interengaging elements when one of said means is in use, and the handle being movable in an opposite direction to strengthen the engagement between said interengaging elements when the other of said means is in use.

2. A device of the class described, constructed as set forth in claim 1, further characterized by the provision of spring means for yieldably resisting the movement of the handle in the first-specified direction.

3. A device of the class described, constructed as set forth in claim 1, and further characterized by the provision of spring means for maintaining said interengaging elements yieldably interengaged, and mechanism on the stem for adjusting the spring means, said mechanism carrying one of the aforesaid interengaging elements.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

JAMES I. APPLESTINE.