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RATCHET TORQUE SCREW DRIVER

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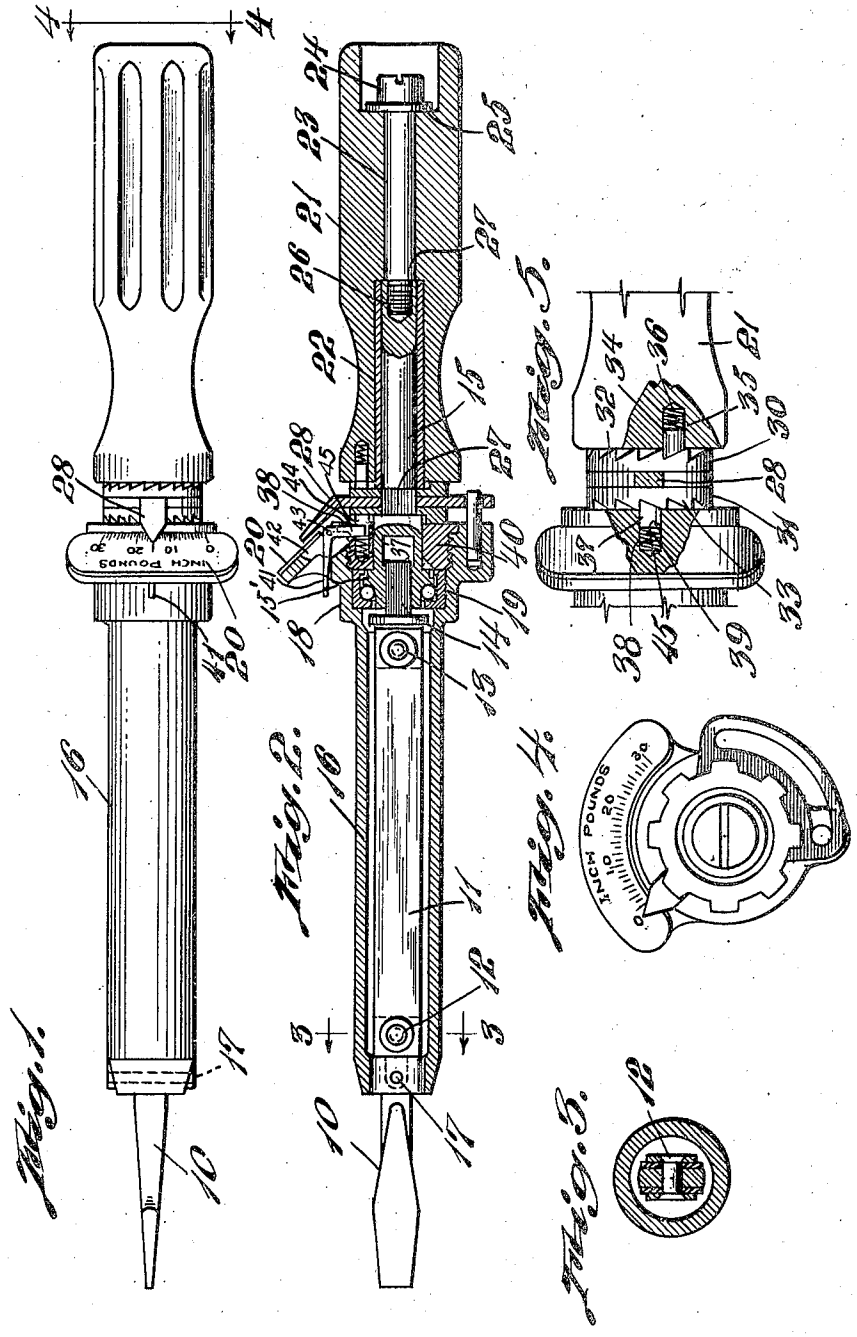



Fig. 1.

Fig. 2.

Fig. 3.




Fig. 4.

Fig. 5.

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## RATCHET TORQUE SCREW DRIVER

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5 Claims. (Cl. 73—139)

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This invention relates to a hand tool, more particularly to a tool which is twisted about its longitudinal axis for doing work at one end thereof such as a screw driver.

In my co-pending application Ser. No. 529,905, filed April 7, 1944, I have illustrated a torque screw driver which illustrates generally the subject matter of this invention. I find, however, that when an instrument of this character is utilized where a considerable amount of torque is to be applied it is frequently desirable to shift the hand on the handle, which is not a simple matter to accomplish in a tool of the character illustrated in the above said application.

One of the objects of this invention is to provide an arrangement so that torque may be applied by an oscillating motion of the hand or a twisting back and forth of the handle of the screw driver.

Another object of this invention is to provide an arrangement so that after a certain predetermined amount of torque is applied to the work this will be held in this position while the handle is rotated to get a new grip on the work.

Another object of this invention is to provide a ratchet motion between the handle and the work driving blade of the tool.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

Fig. 1 is an elevation of my tool;

Fig. 2 is a sectional view taken longitudinally through the tool;

Fig. 3 is a section on substantially line 3—3 of Fig. 2;

Fig. 4 is an end view on substantially line 4—4 of Fig. 1;

Fig. 5 is a fragmental view partly in section showing on a larger scale the ratchet mechanism of the device.

In proceeding with this invention I provide a work engaging member from which there extends two or more ribbons of spring steel stock through which a twisting torque may be applied to the work. A handle is provided which is rotatably mounted with reference to the spring steel members and which is connected to them through a ratchet mechanism. A tubular body is utilized as a convenient means for housing or protecting the ribbon steel members and also as a mounting for one part of my ratchet whereby the torque which has been applied to the members

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will be held while the handle is reversely rotated for a new grip.

With reference to the drawings 10 designates the work engaging member which in this case is the blade of a screw driver. A pair of resilient steel ribbons 11 are riveted at one of their ends as at 12 to the upper end of the work engaging member 10 and they are secured to a rotating member 15 by a rivet 13. The member 15 is formed of two parts comprising a reduced squared portion 14 for connection with the larger portion 15' for the transmission of turning moment. A tubular housing 16 is fixed to the member 10 by a rivet 17 and encloses the ribbon steel members 11 and also provides a mounting 18 for the shaft 14 by reason of the ball bearing 19 which is mounted in the enlarged portion 18 of this body housing. This housing or body carries an indicating plate 20 which is fixed with reference thereto. A handle 21 is provided with a bushing 22 which is freely rotatable upon the shaft 15 and rotatably held in position by a bolt 23 having head 24 and washer 25, the same being threaded as at 26 into the shaft 15 against a shoulder 27 which is formed on the bolt 23.

The shaft 15 is provided with a squared portion 27 upon which a pointer 28 is fixedly mounted so as to extend out and sweep over the indicating plate 20. Upon this squared portion 27 of this shaft 15 there are mounted two ratchet plates 30 and 31 each having teeth 32 and 33 on the distant side thereof and facing in the same rotative direction. A pawl 34 slides in a recess 35 and is pressed by spring 36, also housing in recess 35 of the handle so as to cause this pawl to engage the teeth 32, while a pawl 37 guided in a recess 38 is pressed by spring 39 into engagement with the teeth 33. This recess 38 is formed in a plug 40 which threadingly engages the housing 18 and is fixed in relation thereto, while this plug provides a free passage for the shaft 15 to freely rotate therein.

As the handle is rotated clockwise when viewed toward its handle end, the pawl 34 will engage the teeth 32 and turn the shaft 15 and through the ribbon members 11 will turn the blade 10, unless the resistance is too great in which case twisting these ribbon members will take place. At the same time the ratchet 31 will be rotated so that its pawl will snap by the teeth 33 successively and will be held against a returning motion which the setting up of the members 11 tends to produce. Thus, with the tension held by the pawl 33 the handle 21 may be rotated reversely or backwardly so as to get a new grip and again apply tension

to the shaft 15. Thus, an oscillation motion may be used for driving the screw driver.

In order to release pawl 37 from engagement with teeth 33, a lever 41 is positioned within a slot 42 in the enlarged portion 18 and there pivotally mounted as at 43. The lever has an arm 44 which extends into a slot 45 in the pawl 37. The arm 44 will engage the shoulder formed by the slot and retract the pawl 37 from teeth 33 when the lever is moved about the pivot 43 in a clockwise direction.

I claim:

1. In a tool, a body, a work engaging member fixed to one end thereof, resilient ribbon strips fixed at one end to said member and extending longituidnally of the body and flexible when torsion stresses are applied thereto, a shaft fixed to the other end of said strips and extending longitudinally of the body, a handle rotatably mounted with reference to said shaft, and pawl and ratchet means connecting said handle to said shaft for applying a torsion force thereto, and means operatively connected to said strips and said shaft for indicating the amount of twisting of said strips.

2. In a tool, a body, a work engaging member fixed to one end thereof, resilient ribbon strips fixed at one end to said member and extending longitudinally of the body and flexible when torsion stresses are applied thereto, a shaft fixed to the other end of said strips and extending longitudinally of the body, a handle rotatably mounted with reference to said shaft, and pawl and ratchet means connecting said handle to said shaft and a second oppositely acting pawl and ratchet means for connecting said shaft to said body for applying a torsion force thereto, and means operatively connected to said strips and said shaft for indicating the amount of twisting of said strips.

3. In a tool, a body, a work engaging member fixed to one end thereof, resilient ribbon strips fixed at one end to said member and extending longitudinally of the body, a shaft fixed to the other end of said strips and extending longitudinally of the body, a handle rotatably mounted with reference to said shaft, pawl and ratchet means connecting said handle to said shaft, a second oppositely acting pawl and ratchet means for connecting said shaft to said body, a pointer carried by said shaft and a scale on said body over which said pointer operates.



4. In a tool, a body, a work engaging member fixed to one end thereof, resilient ribbon strips fixed at one end to said member and extending longitudinally of the body, a shaft fixed to the other end of said strips and extending longitudinally of the body having an out of round portion thereof, a pointer on said out of round portion, ratchets on said portion on either side of said pointer, a handle rotatably mounted with reference to said shaft, a pawl carried by said handle to lock with one ratchet upon movement in one direction slipping by said ratchet in the other direction, and a pawl carried by said body to engage the other said ratchet and hold said shaft while the handle is reversely rotated for a new grip, and a scale carried by the body over which the pointer moves.

5. In a tool, a body, a work engaging member at one end of the body and a handle member at the other end of the body, means to connect said members comprising resilient ribbon strips within said body fixed at one end to one member to rotate therewith, an element connected to and extending from said strips at the other end of said strips and double pawl and ratchet means connecting said element to the other member and to said body for transmitting a torsion force from the handle member to the work engaging member and retaining the torque reading while the handle is shifted to a new position, and means operatively connected to said strips at their opposite ends for indicating the amount of twisting of said strips.

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