Feb. 5, 1946. W. STORRIE 2,394,022

TORQUE SCREW DRIVER

Filed April 7, 1944

Fig. 1.

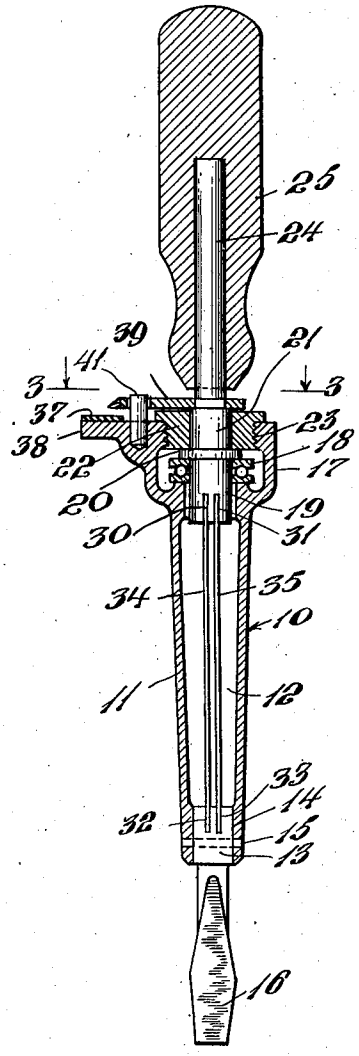


Fig. 2.

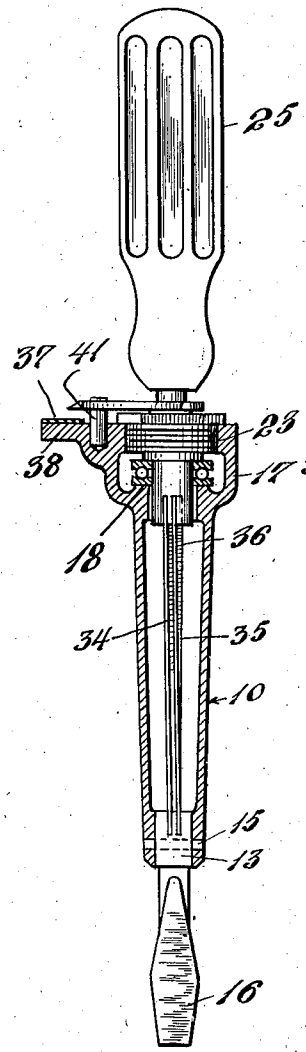


Fig. 5.

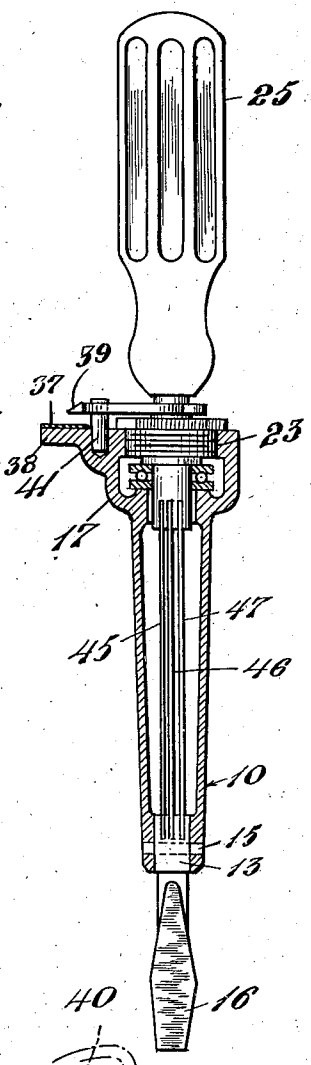


Fig. 3.

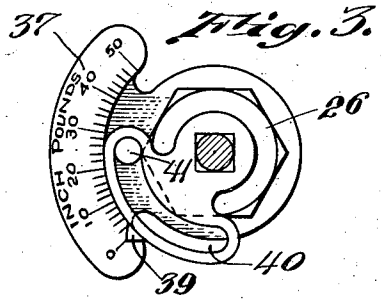
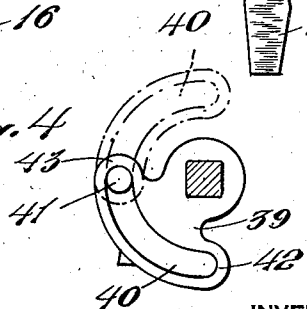


Fig. 4.



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TORQUE SCREW DRIVER

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Application April 7, 1944, Serial No. 529,905

9 Claims. (Cl. 73—136)

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 a screw driver or some such tool the handle is usually rigidly connected to the blade of the screw driver so that when the handle is turned about its central longitudinal axis the blade will turn a corresponding amount. At times it is desirable to prevent excessive force from being delivered from the handle to the part which engages the work, which, in the case of a screw driver, is the blade, in order that the work will not be ruptured such as the screw threads stripped by excessive force applied, especially is this true where the tool is in the hands of an unskilled workman.

One of the objects of this invention is to provide a resilient connection between the handle and the work engaging tool shank so that after a predetermined amount of force is exerted the same will yield and will indicate the amount of pressure applied that the operator may know by observation the force which is being exerted upon the work.

Another object of this invention is to provide a simple construction which will be relatively free from friction.

Another object of this invention is to provide a pair of resilient members through which force is applied and to so arrange these members that they will not friction one upon the other upon twisting.

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 drawing:

Fig. 1 is a sectional view through the torque tool;

Fig. 2 is a view similar to Fig. 1 illustrating a partial turning of the handle with reference to the work engaging member, showing a twisting of the resilient connection between the handle and the member;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a diagrammatic detail illustrating means for limiting the rotation of the relatively moving parts;

Fig. 5 is a view similar to Fig. 1 illustrating a modification.

In proceeding with this invention I provide a member which will engage the work. A screw driver blade is illustrated as the work engaging means in this showing. I also provide a handle and connect the tool engaging member with the handle through a plurality of ribbon like steel springs which may be twisted. The springs are spaced so that when twisted no friction will occur between them to throw off the accuracy of the tool. These parts are conveniently mounted in a body which serves as a partial housing for them.

With reference to the drawing the body of my tool is designated generally 10 and consists of a hollow tubular tapered casing 11 open throughout substantially its length as at 12. At the lower end of this casing 11 a tool engaging member 13 is secured by being inserted into a bore 14 of the body and provided with a pin 15 which extends through the body and through the member 13. The particular tool here shown is a screw driver provided with a blade 16 so as to enter the slot of a screw for turning the same.

At the upper end of the body the casing 11 is enlarged as at 17 and receives a ball bearing 18 which rotatably mounts the stem 19 provided with a flange 20 and a portion 21 which is guided in the bushing 22 having threaded engagement as at 23 with the enlarged portion 17 of the casing. On the outer portion 24 of this stem a handle 25 is fixedly secured. The bushing is provided with a hexagonal flange 26 to be engaged by a wrench for setting it into the threads 23 for securing it in position.

The lower portion of the stem 19 and the member 13 of the work engaging member are both provided with spaced slots as at 30, 31 and 32, 33. Resilient ribbon like steel strips 34 and 35 are suitably anchored in these slots so as to extend from the stem to the tool engaging member in parallel relation and spaced one from the other. The arrangement is such that when the handle is moved in the ball bearing 18 these strips, by being stiff, transmit this turning movement to the tool engaging member 13 in correspondence with the turning which is imparted to the handle 25 until their inherent resistance to turning is overcome by resistance at the member 13. When the work offers sufficient resistance the strips will then twist about an axis between them so as to dispose their upper ends in a different plane from their lower ends as shown at 36 in Fig. 2. Upon release of the handle the strips will regain their parallel plane relation and will return the handle to initial position.

In order that the amount of twisting may be known and graduated a scale 37 is fixedly mounted upon a flange 38 extending outwardly

from the casing 17. This scale is graduated in inch pounds as illustrated in Fig. 3. A pointer 39 is fixed to the stem which carries the handle 25 and is arranged to move over this scale so that the person who is operating the tool by turning the handle 25 may observe by means of the pointer moving over the scale the amount of pressure or force which is being exerted on the work after resistance is encountered and may set up the screw with the desired force by accurate measurement rather than depending upon the feel or touch.

In order to limit the relative movement of the movable parts the pointer 39 is slotted as at 40 (see particularly Fig. 4) and a pin 41 which is fixed relative to the scale by being mounted in the casing 17 extends into the slot 40 so as to engage either the end 42 or the end 43 of this slot upon relative movement of the parts that a limit to the relative movement may be had.

In the case of Fig. 5 instead of using two strips I have provided three strips designated 45, 46, and 47, and it will be readily apparent that any number of a plurality of strips may be provided. In each case, however, the strip will be positioned in spaced relation so that upon turning of the parts, even through ninety degrees, they will not touch the variable friction to disturb the reading on the scale will not occur. Especially might this be true of the torque governing parts such as resilient strips frictioned one on the other.

I claim:

1. In a tool, a body, a work engaging member at one end thereof, a handle mounted on said body for rotative movement about its longitudinal axis relative to said member, a plurality of resilient ribbon strips connecting said member and handle and through which movement of the handle is imparted to said member, said strips being in spaced relation whereby a twisting of the strips through a substantial arc may be had without contact of one strip with the other.

2. In a tool, a body, a work engaging member at one end thereof, a handle mounted on said body for rotative movement about its longitudinal axis relative to said member, a pair of resilient ribbon strips connecting said member and handle and through which movement of the handle is imparted to said member, said strips being in spaced relation whereby a twisting of the strips through a substantial arc may be had without contact of one strip with the other.

3. In a tool, a hollow tubular body, a work engaging member at one end thereof, a handle in extension of and mounted on said body for rotative movement about its longitudinal axis relative to said member, a plurality of resilient ribbon strips located in said hollow body and connecting said member and handle and through which movement of the handle is imparted to said member, said strips being in spaced relation whereby a twisting of the strips through a substantial arc may be had without contact of one strip with the other.

4. In a tool, a hollow body, a longitudinally extending work engaging member fixed thereto at one end thereof, a handle mounted on the body at the other end thereof for rotation relative to the body, spaced resilient strips extending from the handle to the member through which twisting torque is transmitted from the handle to the member to turn the same about its longiudinal central axis.

5. In a tool, a hollow body, a longitudinally extending work engaging member fixed thereto at one end thereof, a handle mounted on the body at the other end thereof for rotation relative to the body, spaced resilient strips in said body extending from the handle to the member through which twisting torque is transmitted from the handle to the member to turn the same about its longitudinal central axis.

6. In a tool, a body, a longitudinally extending work engaging member fixed thereto at one end thereof, a handle mounted on the body at the other end thereof for rotation relative to the body, spaced resilient strips extending from the handle to the member through which twisting torque is transmitted from the handle to the member to turn the same about its longitudinal central axis, a scale carried by the body and a pointer carried by the handle and movable over the scale.

7. A tool substantially as set forth in claim 6 in which the scale is in a plane at right angles to the axis of the body for observance in looking axially of the tool.

8. A tool substantially as set forth in claim 6 in which the pointer is provided with an arcuate slot and a pin fixed relative to the scale and body extends into said slot to limit the relative movement of the handle and body.

9. A tool as set forth in claim 1 wherein there is a stop to limit the relative rotation of said member and handle.

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