June 3, 1930. F. R. ROSAN 1,761,156

TURNING TOOL APPLICABLE TO REMOVE REFRACTORY SCREWS

Filed Aug. 8, 1929

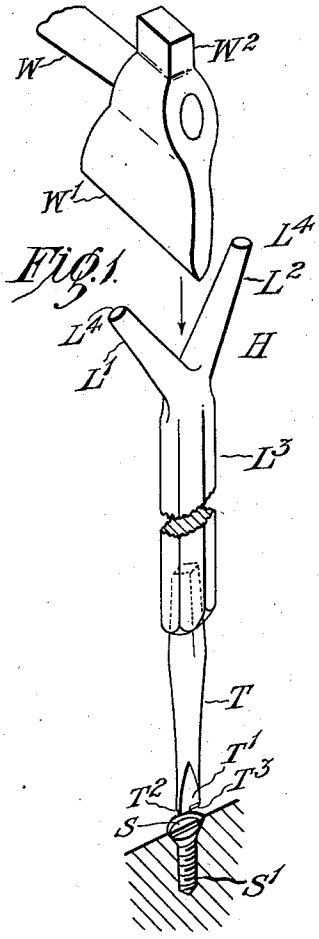


Fig. 1.

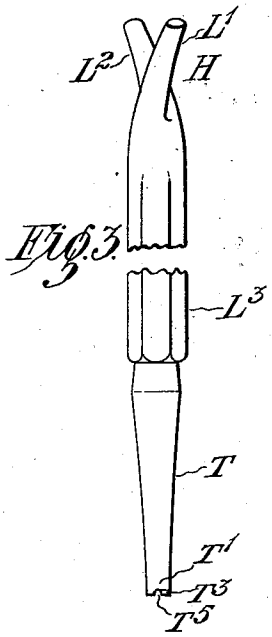


Fig. 3.

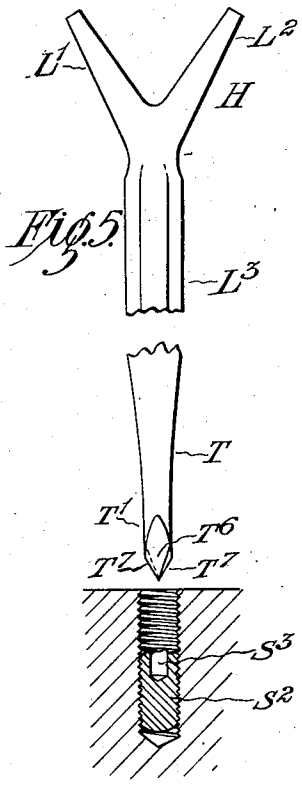


Fig. 5.

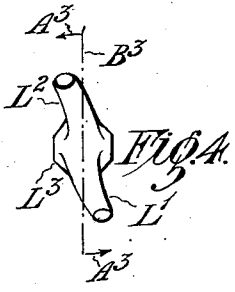


Fig. 4.

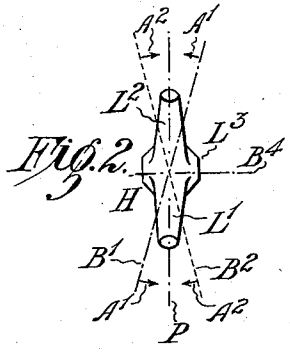


Fig. 2.

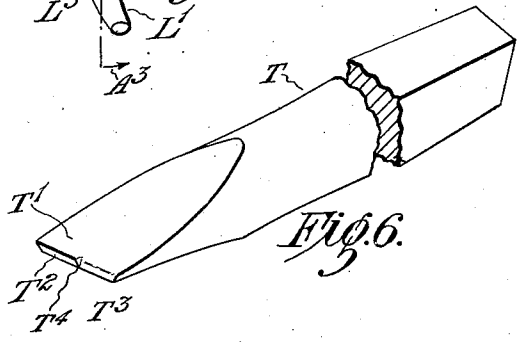


Fig. 6.

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UNITED STATES PATENT OFFICE

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TURNING TOOL APPLICABLE TO REMOVE REFRACTORY SCREWS

Application filed August 8, 1929, Serial No. 384,392, and in Australia May 6, 1929.

An object of this invention is to provide a tool usable to loosen inserted screws which resist ordinary efforts to withdraw them. My tool is usable to rotate screws which are corroded or have damaged or broken heads. It can also be applied for inserting and tightening screws and for various other purposes involving rotation by the application of considerable force.

Another object of the invention is to produce, simultaneously, a triple effect; (1) pressure in the desired direction, as downward; (2) shock or jar to loosen the impacted screw or article; and (3) application of torsional stress to produce rotation.

This tool includes a member which causes the triple effect aforesaid, by reason of the shape of said member or the striker thereof. The preferred form of tool is herein described with reference to the drawings. The said member has a bit, or screw engaging element, a stem usable as a handle, and a head having inclined surfaces, on which suitable blows have the effect of transmitting to the bit, and so to the refractory screw or object engaged thereby, the said triple effect.

In my preferred arrangement the tool head is bifurcated, and adapted to be struck by a hammer having a suitable striking edge, wedge shaped being suitable.

One suitable form of the bit is that of an ordinary screwdriver. I find it however an advantage to provide the bit with cutting edges, when the screw needs a better slot. These edges as a result of the heavy blows the head receives, accentuate the screw slot, or cut a fresh one if the original is absent, to ensure grip for turning purposes.

In the drawings herewith in which the scales vary, I illustrate embodiments of my invention, but details shown can be modified, while retaining characteristics hereinafter claimed.

Figure 1 is a perspective view of the tool and the striker. The tool is about to be lowered into the slot of a countersunk screw which is to be removed.

Figure 2 is a plan of the tool head of Figure 1, and shows by broken lines planes of impact by a striker, whereby to twist the tool in one of the directions indicated by arrows.

Figure 3 shows a tool with modified horns.

Figure 4 is a plan of the head in Figure 3, a dotted line indicating the plane of impact.

Figure 5 shows a tool with its point or bit shaped to suit its application to a broken screw requiring extraction, shown below it.

Figure 6 is a perspective view of a tool bit, on a larger scale.

The tool and its bit may be one piece; or, as shown in Figures 1 and 3 a removable bit is located in a socket. The stem of the tool can be held by hand to steady the tool during the striking action.

In experiments I have found that a striker can be used in engagement with means to guide it in the direction required for impact; it could be of sleeve form, engaging a suitable stem, or it could slide inside guides, but the free striker shown in Figure 1 is simple and effective.

The tool head H has V shaped or inclined surfaces on horns or limbs L^1, L^2 which diverge from the handle L^3. When the limbs are struck forcibly within the fork obliquely to the middle plane P of the fork, the tool is rotated through a short arc. In Figure 1 a correct blow is the oblique one indicated by line B^1, or B^2, in Figure 2, according to whether the screw is to be removed or to be more tightly inserted. To remove the screw the blows are on line B^1 rotating the tool in the direction of arrows A^1. To tighten a screw the blows are on line B^2, causing rotation in direction of arrows A^2. When the striker meets the sides of the limbs it urges each limb clockwise or contra-clockwise as the case may be.

For rotation in one direction only, it is practicable to provide limbs which diverge helically or sideways as in Figures 3 and 4, to receive blows on line B^3, causing rotation in direction of arrows A^3.

The limbs are shown tapered at L^4 Figure 1, but limbs of equal thickness throughout will serve.

The striking tool shown in Figure 1 is effective. It has a handle W, a wedge shaped

edge W^1, and it can have a hammer head W^2, for other uses.

In the stem L^3 is a socket for a bit T, having any suitable point T^1. In order to ensure a firm grip on the head S of a screw S^1, or the like, the bit edge is conveniently made with oppositely bevelled faces T^2, T^3, having between them a recess as T^5, or meeting at T^4 without a recess. Screws having well defined slots can be engaged by the bit readily and are not damaged thereby, but damaged or corroded screws may need to be prepared for the bit as by punching with a cold chisel to form a sufficient indentation for preliminary grip.

To extract a broken screw S^2, the procedure found effective is to drill a hole S^3 in it and to use a bit which has a wedge shaped end T^6 and faces T^7, by which to grip in a recess.

When the tool point is set in position ready to be struck, it may be given a few preliminary blows in the fork on line B^4 to ensure engagement, after which it is to be struck heavily in the correct plane described, to obtain the said threefold effect.

In the claims the word "screw" is used to denote any object, to the rotation of which force is to be applied, to extract or loosen said object, or, if required, cause it to hold more tightly.

I claim:—

1. A tool having a point to engage a screw and a head having outwardly tapered fingers forming a downwardly directed apex adapted to be struck by an implement to impart pressure, sudden shock and torsional stress to said screw.

2. A tool having a point to engage a screw and a V-shaped head whereby, when said head is struck by an implement in the direction of the axis of the tool, pressure, sudden shock and torsional stress are imparted to said screw.

3. A tool having a point to engage a screw and a head having outwardly tapered helical fingers forming a downwardly directed apex adapted to be struck by an implement to impart pressure, sudden shock and torsional stress to said screw.

4. A tool having a point to engage a screw and a V-shaped head with helical arms, whereby, when said head is struck by an implement in the direction of the axis of the tool, pressure, sudden shock and torsional stress are imparted to said screw.

5. A tool having oppositely disposed cutting edges at its point to engage a screw and a V-shaped head with helical arms, whereby, when said head is struck by an implement in the direction of the axis of the tool, pressure, sudden shock and torsional stress are imparted to said screw.

6. A tool having a head provided with outwardly tapered fingers forming a downwardly directed apex adapted to impart pressure, sudden shock and torsional stress to a screw driver.

In witness whereof I have hereunto signed my name to this specification at Melbourne in the State of Victoria, in Australia, this ninth day of July, 1929.

FERDINAND ROBERT ROSAN.