Oct. 15, 1929. F. L. KRUMMEL 1,731,979

SCREW DRIVER

Filed Sept. 20, 1928

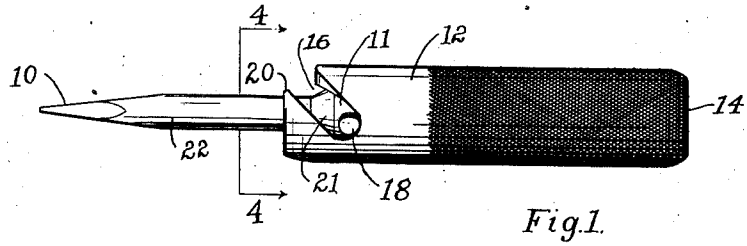

Fig. 1.

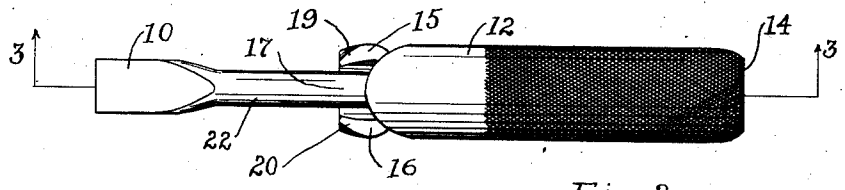

Fig. 2.

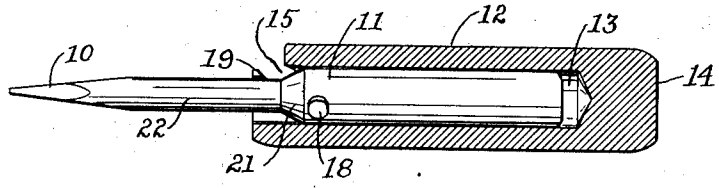

Fig. 3.

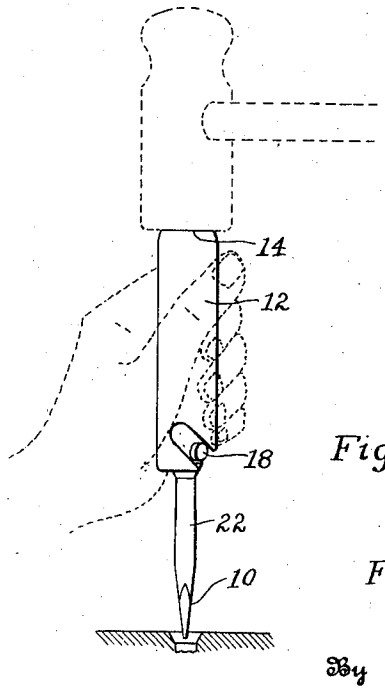

Fig. 5.

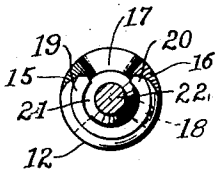

Fig. 4.

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UNITED STATES PATENT OFFICE

FRITZ L. KRUMMEL, OF GRASSTON, MINNESOTA

SCREW DRIVER

Application filed September 20, 1928. Serial No. 307,078.

This invention relates to screw drivers and has for an object to provide a screw driver by means of which more force may be applied to the screw in tightening or loosening the same than would be possible with the ordinary type of screw driver.

Another object of the invention resides in constructing the screw driver so that the impelling means in rotating the screw forces the screw driver bit into the screw slot and prevents the displacement thereof while the impelling force is being applied.

A still further object of the invention resides in constructing the screw driver so that the same may be instantly and easily adjusted to rotate the bit in either direction.

Another object of the invention resides in providing a screw driver which may be operated to turn the screw by a blow from a hammer.

A still further object of the invention resides in constructing the screw driver with a relatively massive body member having a percussion surface and a bit rotatably supported thereon, and adapted to be rotated by a blow upon said percussion surface, the mass of said body member assisting in resisting the reaction from the rotation of said bit.

The various other objects and advantages will more fully appear from the detailed description and drawings of my invention.

In the drawing:

Fig. 1 is a side elevational view illustrating an embodiment of my invention.

Fig. 2 is similar to Fig. 1 taken at right angles thereto.

Fig. 3 is a longitudinal, sectional elevational view, the section being taken along lines 3—3 of Fig. 2.

Fig. 4 is a cross sectional view, the section being taken along lines 4—4 of Fig. 1.

Fig. 5 is a diagrammatic elevational view on a reduced scale, illustrating the use of the tool.

Referring in detail to the drawing, my improved screw driver comprises a body member 12 and a bit 10. The body member 12 is constructed in the form of a relatively massive handle which is provided with a longitudinal bore 13 open at one end and closed at the other to form a socket as illustrated in Fig. 3. The closed end of the body member 12 is formed with a percussion surface or anvil 14 which may be hit by a hammer, as shown in Fig. 5, for the purpose of operating the device as will presently be explained. The opposite extremity of the body member forming the mouth of the socket is constructed with a pair of oppositely directioned spiraling cam slots 15 and 16 which intersect one another and extend through the end of the body member to form two winglike members 19 and 20 separated by a channel 17 which communicates with both of the slots 15 and 16.

The bit 10 is provided with a stem 22 which terminates in an enlarged shank 11 forming a shoulder 21 therewith. The shank 11 is adapted to be received within the bore 13 of body member 12 and fits rather loosely within said bore so that said shank and body member may move freely in a rectilinear and rotatable manner relative to one another. A lug 18 projects outwardly from the shank 11 of bit 10 near the shoulder 21 thereof. This lug is adapted to travel along the slots 15 and 16 and is insertable therein through the channel 17. In order to hold the two portions of the tool together and retain lug 18 within slots 15 and 16, the two wings 19 and 20 forming the extremities of the body member 12 adjacent the slots 15 and 16 may be bent inward into the position shown in Fig. 4, so as to form an abutment or stop for shoulder 21 of the shank.

In the use of the tool for either loosening or tightening a screw, a bit 10 is applied to the screw head in the usual manner as illustrated in Fig. 5, and the socket 12 is adjusted rela-

tive to the bit, so as to bring the lug 18 in the end of the desired cam slot adjacent channel 17 to utilize the camming action of the said cam slot. When the percussion surface of the body member 12 is struck with a hammer, the same is given a rectilinear impulse which transfers a rotative impulse to the lug 18 about the longitudinal axis of the tool, thereby rotating the bit 10 in the proper direction to loosen or tighten the screw, as the case may be. The screw driver may also be used in the ordinary manner by merely rotating the handle by the hand. When so used the lug 18 is disposed at the end of the respective cam slot 15 or 16.

It will be observed that the formation of the cam slot is such that the bit may be quickly adjusted from one cam slot to the other to secure a right handed or left handed rotation, whichever may be required. For the purpose of obtaining a more secure grip on the handle, the surface of the socket may be knurled in the usual manner, as illustrated in Figs. 1 and 2, or the handle formed in different shapes such as are well known in the art.

Changes in the specific form of my invention as herein disclosed may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A screw driver comprising a comparatively heavy body member having an open ended through slot having diverging wings defining right and left spirals, a bit carried by said body member and having a lug guided in said slot, a shoulder formed on said bit, said wing-like member being bent to engage said shoulder to prevent the disengagement of said lug with said slot.

2. A screw driver comprising a comparatively heavy body member having a pair of intersecting through cam slots defining right and left spirals, said slots extending through the end wall of the body member to form a pair of wing-like members separated by a bore or channel communicating with both of said slots, a bit carried by said body member and having a lug adapted to be moved along either of said slots and insertible therein through said channel, a shoulder formed on said bit, said wing-like members being bent to engage said shoulder to prevent the disengagement of said lug from said slots.

3. A screw driver comprising a comparatively heavy body member formed with an axial bore, a bit slidably and revolubly mounted therein, said bit having a lug thereon, the body member being cut through from an end thereof to form intersecting right and left cam slots for bit twisting cooperation with said lug and to form an entry way for said lug to the intersection of said slots through the end wall of the body member, said cam slots and way visibly receiving said lug.

4. A screw driver comprising a comparatively heavy tubular body, a bit spirally movable therein and having a lug thereon, the body member being cut through to form communicating divergent cam slots for visibly receiving said lug for right and left bit twisting cooperation therewith.

In testimony whereof I have affixed my signature to this specification.

FRITZ L. KRUMMEL.