May 21, 1946. E. E. CLARK 2,400,684

TOOL

Filed Dec. 14, 1943

FIG. 1.

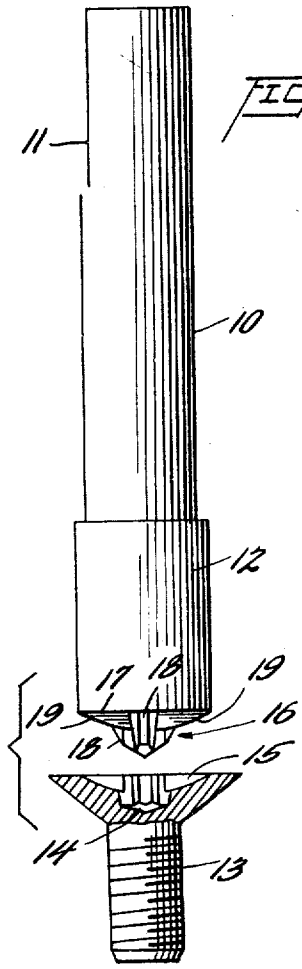


FIG. 2.

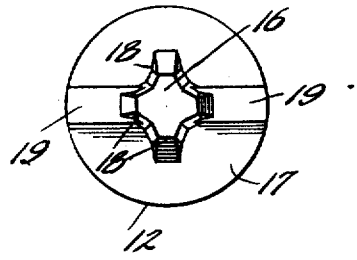
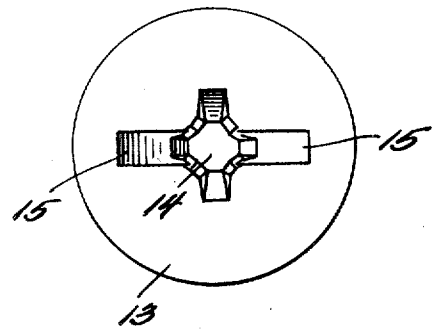


FIG. 3.



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Patented May 21, 1946 2,400,684

UNITED STATES PATENT OFFICE

2,400,684

TOOL

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Application December 14, 1943, Serial No. 514,238

1 Claim. (Cl. 145—50)

This invention relates to driving tools for threaded fasteners such as screws and the like, and more particularly to a tool for driving or securing, as well as unscrewing or removing, threaded elements having a modified "Phillips" type driving recess such as that described and claimed in my copending application Serial No. 461,007, filed October 6, 1942, now Patent No. 2,359,898, issued October 10, 1944.

The aforesaid application describes a novel threaded element having a driving recess of the "Phillips" type, modified by superimposing over one pair of the radial grooves of the recess, a segmental, diametrically disposed, parallel-sided kerf or groove terminating short of the periphery of the screw head, somewhat shallower than the deeper portions of the recess, and extending beyond the normal radial dimensions thereof. Such a recess is suitable for accommodating either a conventional flat-bladed screw-driver, a "Phillips" screw-driver, or the edge of a small coin when neither of the mentioned screw-drivers is available.

It has been determined, however, that by employing the driving tool of the present invention in conjunction with the threaded element of the above-mentioned copending application, especially good results are obtained, in respect to the relation between end thrust and torque. In other words, with the tool of the present invention, the tendency of the tool to move end-wise out of the recess, when torque is applied, is very much reduced as compared to other forms of drivers when used with the same recess, and in fact the combination of the present tool with the recess in question produces better results, in respect to end-thrust, than the combination of the conventional "Phillips" driver and conventional "Phillips" recess.

It is, therefore, the general object of the present invention to provide an improved driving tool for use with the type of threaded element described in the aforesaid copending application. Other and further objects, features and advantages will be apparent from the description which follows, read in connection with the accompanying drawing, in which:

Figure 1 is an elevational view of the driver and screw, the screw head being shown in section to illustrate the driving recess;

Figure 2 is an end view of the driver of Figure 1; and

Figure 3 is a plan view of the screw head of Figure 1.

In order to facilitate an understanding of the invention, reference is made to the embodiments thereof shown in the accompanying drawing, and detailed descriptive language is employed. It will nevertheless be understood that no limitation of the invention is thereby intended and that various changes and alterations are contemplated such as would ordinarily occur to one skilled in the art to which the invention relates.

In Figure 1 the driving tool shown is of the type adapted for power driving, having a cylindrical shank 10, with a flattened portion 11 for engagement with a suitable power means, not shown. The tool is provided with an enlarged cylindrical head portion 12, but it will be understood that the shank and head portions may be of equal or unequal diameters, as other conditions may dictate, or of other than circular cross-section, without in any way departing from the invention.

The screw 13 is of the type described in my above-mentioned copending application, having a driving recess in the form of a conventional "Phillips" recess 14 with a segmental or curved-bottom, parallel-sided kerf or groove 15 superimposed thereon.

The width and radius of curvature of the kerf 15 are preferably but not essentially such as to conform with the necessary clearance, to a small coin or washer.

The novel driving blade 16 of the tool projects from the flat end surface 17 of the head portion 12, and is generally complementary in form to the recess in the screw 13, so that the surface 17 of the driver head engages the flat head of the screw when the blade 16 is fully seated in the recess of the screw. More particularly the blade 16 comprises four radially disposed wings 18, which are tapered both vertically and horizontally as in the conventional "Phillips" driver, two opposite wings being provided with segmental extensions 19. The latter are of lesser height than the wings 18, and preferably are not substantially in excess of one-half the height of the wings, in order that the wings 18 may take their full share of the torque load when driving or unscrewing a screw or fastener. Preferably, but not essentially, the width and radius of curvature of the extensions 19 conform substantially to those of a small coin, such as a dime or a one-cent piece.

In tests with threaded fasteners having the type of recess described, it has been found that the driver of the present invention has only about one-half the end-thrust or "throw-out tendency," over the usual range of driving torques encountered in practice, which is exhibited when a con-

ventional "Phillips" driver is used. Moreover, as previously stated, the combination of the modified driver and modified recess produces considerably less end-thrust than the standard combination of "Phillips" driver and "Phillips" recess.

Also, since the flat end surface 17 of the driver seats firmly against the flat head of the screw, the driver is prevented from rocking relative to the screw, facilitating the use of the tool and eliminating the breakage of driver kits which frequently occurs when torque is applied while the driver is inclined to the axis of the screw.

It is apparent from the foregoing that I have provided an improved driving tool accomplishing the stated general object, and by which greatly improved results may be achieved in driving threaded elements of the type for which it is suited.

Obviously, the present invention may be applied equally well to power driven and hand driven tools of all kinds which are used for driving and unscrewing threaded fasteners.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

A driver bit for threaded fasteners such as screws and the like, comprising a shank portion and a head portion, said head portion having a flat surface on its outer end, adapted to engage the flat top surface of a threaded fastener, and a torque transmitting blade portion projecting from said flat surface, said blade portion comprising a plurality of kerf engaging wings of the "Phillips" type blade, two opposite wings of said blade being provided with convex segmental radial extensions having approximately the thickness and radius of a small coin, said extensions having a maximum height not substantially in excess of one-half the height of said torque transmitting blade portion.

EUGENE E. CLARK.