

Jan. 2, 1945.

M. A. WEST ET AL

2,366,682

SCREW DRIVER BIT

Original Filed Sept. 28, 1940 2 Sheets-Sheet 1

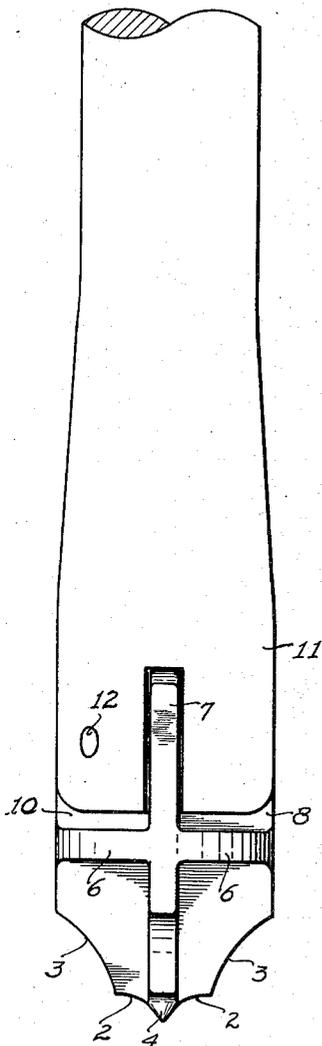


Fig. 1

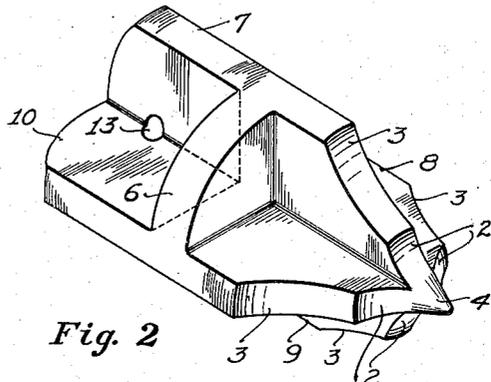


Fig. 2

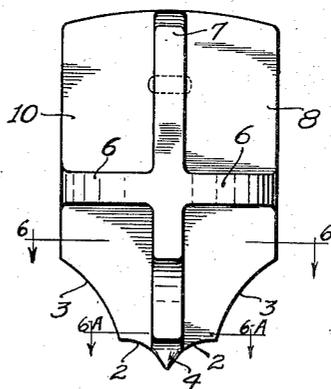


Fig. 3

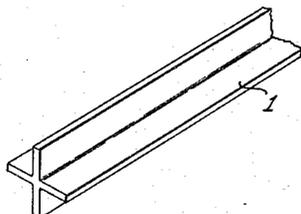


Fig. 4

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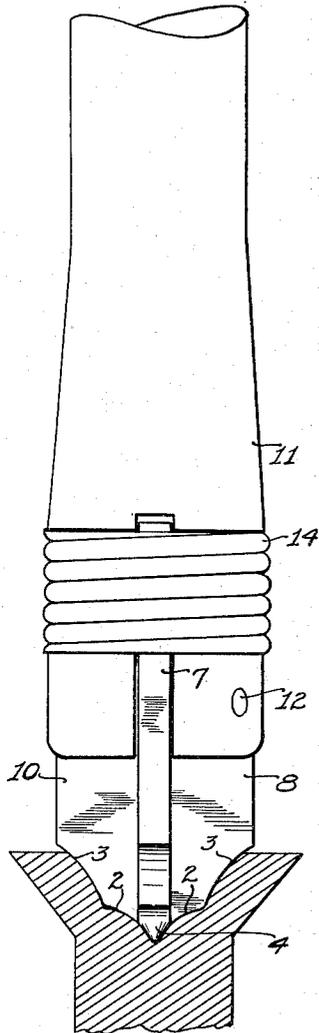


Fig. 7

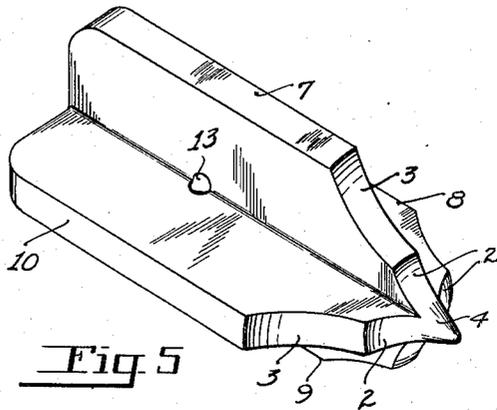


Fig. 5

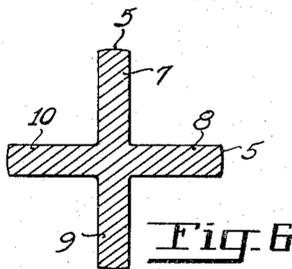


Fig. 6

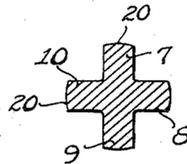


Fig. 6A

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UNITED STATES PATENT OFFICE

2,366,682

SCREW DRIVER BIT

Maxwell A. West, Portland, and George E. West, Sherwood, Oreg., assignors, by direct and mesne assignments, to Champion, Inc., Portland, Oreg., a corporation of Oregon

Continuation of application Serial No. 358,900, September 28, 1940. This application April 1, 1942, Serial No. 437,180

1 Claim. (Cl. 145—50)

This invention relates to screw drivers, especially to hand and machine drivers suitable for driving certain types of recessed-head screws, and, more particularly, to double-slotted screws or screws having a recess of more or less cruciform shape.

This application is a continuation of our pending application, Ser. No. 358,900, which was filed September 28, 1940, as a continuation in part of application, Ser. No. 287,773, which latter application is now Patent No. 2,218,631 issued under date of October 22, 1940, entitled "Screw driver," to which reference is made.

With drivers especially adapted for recessed-head screws, having recesses of cruciform and similar shapes, the wear occurs on the driving end or tip, with the result that common forms of drivers used for such screws heretofore are relatively short-lived and either have to be discarded entirely as soon as the tip becomes worn down or otherwise marred or broken, or else require the regrinding of the tip, which is troublesome and more or less expensive.

One object of this invention is to provide a driver with removable bit, which can be very simply and inexpensively made, so that when the bit becomes worn it may be thrown away and replaced by a new one at very nominal cost.

Another object of this invention is to provide a driver bit, suitable for a double-slotted or cruciform-recessed screw, with the tip so formed as to facilitate the seating of the driver and to reduce greatly the possibility of reaming or marring the screw recess or head.

A still further object of our invention is to provide a practical and efficient driver for the improved screw described in our application, Ser. No. 302,352, filed November 1, 1939, now Patent No. 2,216,382.

These and other objects we are able to attain by making a screw driver with a bit formed and shaped in the manner hereinafter briefly described with reference to the accompanying drawings.

In the drawings:

Fig. 1 is a view, on an enlarged scale, of the lower half of a screw driver in which one form of our invention is embodied;

Fig. 2 is a view in perspective of the removable bit of the driver of Fig. 1, the bit being shown entirely removed from the rest of the screw driver;

Fig. 3 is a front elevation of the same driver bit;

Fig. 4 is a perspective view drawn to a much

smaller scale of a section of milled bar stock from which the driver bit may most efficiently be made;

Fig. 5 is a view in perspective, drawn to the same scale as Figs. 1, 2 and 3, of the driver bit when formed from the bar of Fig. 4;

Fig. 6 is a transverse section taken on the plane corresponding to the line 6—6 of Fig. 3;

Fig. 6a is a similar transverse section on a plane corresponding with line 6a—6a of Fig. 3; and

Fig. 7 illustrates a special form of screw driver employing the bit of Fig. 5 and showing the same inserted in the recessed-head of the screw described in application, Ser. No. 302,352, now Patent No. 2,216,382, the screw head being shown in section.

Referring first to Figs. 4 and 5, the driver bit of Fig. 5 may preferably be manufactured in the following manner:

A piece of milled or rolled bar stock such as shown in Fig. 4 and designated 1, is cut to the desired length and one end thereof is machined so that the ends of the lateral sections or wings will be formed into wings of identical shape, as shown in Fig. 5, each wing having the bottom edge formed into a longitudinally concaved surface 2 and having a second longitudinally concaved surface 3 formed on the outer wall leading outwardly from the termination of the first concaved surface 2. A tip 4, having a rounded or conically-shaped surface, extends on the bit axis beyond the bottom edges of the wings and the bottom edges or concaved surfaces 2 merge into the surface of the tip 4. The tip is preferably conical, the vertex of which coincides with the axis of the bit, but the point of the vertex is preferably slightly rounded, as shown in Fig. 5.

The radius of curvature of the longitudinally concaved surface 2 is preferably less than the radius of curvature of the concaved surface 3, and the concaved surface 2 is also considerably shorter in extent than the concaved surface 3, but surface 2 makes a greater angle with the central axis than surface 3.

In machining or forming the surfaces 2 and 3 of the wings, these surfaces are also rounded in a plane normal to the axis, as indicated by the curved outer surface of the wings as shown at 5 in the transverse section constituting Fig. 6 and at 20 in Fig. 6a. This additional curvature of the surfaces 2 and 3 has a considerable advantage in preventing any reaming or marring of the tops of the walls of the screw slots if the driver tool is rotated when the bit is being inserted into the screw recess. The fact that the ends of the surfaces 2 become nearly horizontal

before their juncture with the surfaces 3 further prevents possible reaming of the screw recess even though the driver is inserted only part way in the recess. This is also true when the driver is being withdrawn from the recess while the driver is being rotated. The entire forming of the tip and wing surfaces may be accomplished by subjecting the end of the section of milled bar 1 of Fig. 4 to a single rotary machine operation.

The bit, when formed from a piece of milled bar of the kind shown in Fig. 4, will, we have found, be of sufficient strength to withstand all ordinary strains imposed on screw drivers. However, when unusual strains are to be encountered as, for example, when large, specially-tempered screws are to be driven into very hard wood, it may be necessary to reinforce the driver bit or tip. This may be done by forming the bit with a transverse web 6 (see Figs. 1, 2 and 3) joining and bracing the driving wings 7, 8, 9 and 10.

The bit in the form shown in Fig. 5, or in the specially-reinforced form shown in Fig. 2, may be mounted in the end of the screw driver shank in the simple manner illustrated in Fig. 1. Radial slots, corresponding to the wings 7, 8, 9 and 10 of the bit, but slightly wider than the thickness of the wings, are cut in the bottom end of the shank 11. A pin 12 extends through the shank and through a hole 13 (see Fig. 2) of slightly larger diameter provided in the bit, thus holding the bit in the shank. If desired, additional spring means, such as shown at 14 in Fig. 7, may be added to bear against the upper portions of the edges of the wings of the bit in order to hold the bit normally with its axis in alignment with the shank axis.

While we have described the removable bit for the screw driver as preferably made from a section of milled bar stock, shown in Fig. 4, it is possible, of course, to make the bit in other ways. However, we have found the method as described

to be very practical and the use of such milled bar stock facilitates the forming of the wings with plane surfaces for the side walls, which is a distinguishing feature of our special bit. Other distinguishing features are the concaved bottom edges of the wings and the conical or rounded tip into which the bottom edges merge and which has been found to aid materially in centering the bit for insertion into the screw recess.

10 We claim:

A removable bit adapted to be mounted in the end of a screw driver shank and designed for driving screws with a cruciform recess, said bit formed from a length of bar of cruciform cross section causing said bit to have four wings with the side walls of the wings constituting plain surfaces throughout their entire extent and with the adjacent plane surfaces forming right dihedral angles, said wings being identical in form and size, the bottom edges of said wings being identically shaped, the lower portion of the side edge and the bottom edge of each wing formed into a side edge and a bottom edge, consecutively arranged concave surface, the outer ends of said concave bottom surfaces approaching perpendicularity with the axis of the bit and the inner ends of said concave bottom surfaces sloping downwardly and combining and merging to form a pronounced tip extending downwardly on the bit axis, said concave bottom surfaces also being rounded transversely of the bit axis causing said tip to be conical in shape, whereby said tip will aid in guiding the bottom end of said bit into a cruciform screw recess and the rounded concave surfaces will prevent injury to the tops of the walls of the recess should driving power be applied to the driver and bit while the bit is being brought into contact with the screw head and before it is properly seated in the screw recess.

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