

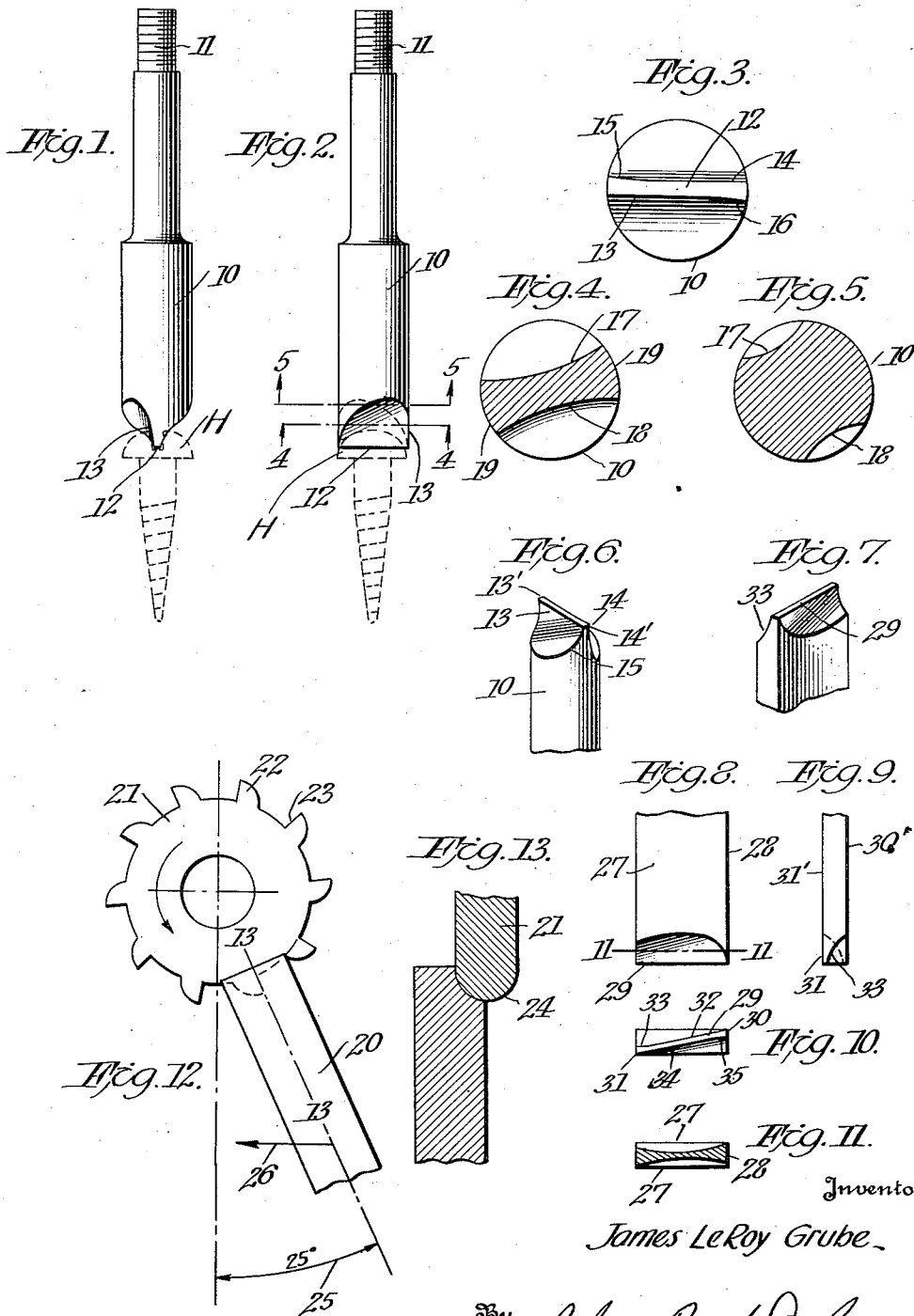
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SCREW DRIVER

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SCREW DRIVER

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The present invention relates to screw drivers, and more particularly to the construction or formation of the bit which is adapted to enter the head slot of a screw. In driving screws with power driven tools, there has always been a substantial percentage of breakage of the driving blades. It is not unusual for the average workman to break from six to nine blades a day with an electric driver.

An object of the present invention is to provide a blade which under ordinary usage will have a substantially increased life.

A still further object of the invention is to provide a materially strengthened blade which may be used with the usual types of screws, whether round or flat headed, and which may be manufactured economically and at virtually no increased cost.

Another object of the invention is to afford a blade which will not tend to slip from the head slot of the screw.

These and other objects of the invention, more closely associated with the details of a construction of preferred embodiments illustrated in the accompanying drawings, will become clearer as the description proceeds. In the accompanying drawings

Figure 1 is an elevational view.

Figure 2 is an elevational view taken at a right angle of Figure 1.

Figure 3 is an end view.

Figure 4 is a cross section on the line 4—4 of Figure 2, looking in the direction of the arrows.

Figure 5 is a cross sectional view on the line 5—5 of Figure 2 looking in the direction of the arrows.

Figure 6 is a perspective view.

Figure 7 is a perspective view of a modified form.

Figure 8 is a fragmentary side elevational view of the form illustrated in Figure 7.

Figure 9 is an edge view of the same form.

Figure 10 is an end view of the modified form.

Figure 11 is a cross sectional view on the line 11—11 of Figure 8.

Figure 12 is a view illustrating the position of the stock during the milling operation

when the blade is made in this manner, and

Figure 13 is a sectional view on the line 13—13 of Figure 12.

Referring to the drawings for a more detailed description, 10 indicates a blade adapted to be used with a power driver and having a threaded shank 11 for attachment of the same to the power apparatus. The blade is made from round stock and the bit portion of the blade, which is immediately associated with the screw, has an edge 12 (Figure 3) provided on opposite sides with relatively flat driving faces 13, 14 each extending substantially the entire length of the bit edge 12, or in other words, the entire width of the end of the bit. The face 13 is deepest at the end 13' of the bit edge 12, and progressively decreases in depth toward the opposite end 14' adjacent which it merges into a laterally extending shoulder or thickening 15. The opposite face 14 is deepest at the end 14' and progressively decreases in depth toward the end 13' adjacent which it merges into a laterally extending shoulder or thickening 16. The progressive decrease in depth of the faces is due to the fact that the shoulders 15, 16 do not extend across the bit in parallelism with the edge 12, but extend transversely of the bit at an inclination to this edge, although, of course, disposed in a plane which is parallel to the edge. The shoulders 15, 16 begin respectively adjacent the ends 13', 14' of the bit edge and curve laterally and also transversely of the blade at an inclination to the edge 12. As will be observed from Figures 1, 6 and 13, each shoulder merges with the driving face throughout its length on an arc so that there is no abrupt or angular joining of the shoulders with the driving faces at the bases of the faces. Not only does each driving face merge into the shoulder in a direction away from the edge 12, but lengthwise of the face or transversely of the bit, each face at its shallowest portion merges gradually into the shoulder. As will be observed, the shoulders are each disposed behind the opposite driving face and thus reinforce the driving faces.

Immediately adjacent the edge 12 of the bit, the driving faces which extend only par-

tially across the bit, are flat, and in a plane spaced above the edge, the faces 17, 18 of the bit are each concaved, as illustrated in Figure 4, which is taken substantially on the line 4—4. This concave formation is of particular value when the blade is employed with a screw having a rounded head H as illustrated in dotted lines in Figures 1 and 2, since it adapts the bit to the head which is slightly higher than one of flat formation exactly at the center of the bit where the peak of the screw head is normally received. Moreover, since the sides 17, 18 are wider at the ends 19, lateral movement of the blade, as long as the bit is within the slot, is resisted. The radius of curvature of the concave portion decreases longitudinally of the blade in a direction away from the bit, as illustrated in Figure 5, which shows the cross section on the line 5—5 of Figure 1.

The blade may be made in any desired manner, and Figure 12 illustrates the position of the stock 20 with respect to a milling cutter 21 having teeth 22, when the blade is formed by a milling operation. The teeth 22 may have the contour illustrated in Fig. 13, each tooth being provided with a flat face 23 and a rounded edge 24. In cutting bits for medium size screws, the stock may be held in the travelling dividing head (not shown) at an angle of substantially 25 degrees, illustrated by the arrow headed line 25 (Figure 12), and when held at this angle, if the stock is moved in the direction indicated by the arrow 26, the blade will be cut at one side, as illustrated in Figures 1 to 6 inclusive. It will be understood, of course, that the invention is not limited to the formation of the bit by milling operation, since the bit could be readily forged.

Since the driving faces 13, 14 immediately adjacent the edge 12 are substantially parallel to one another and to the sides of the screw slot, maximum driving contact is obtained, and moreover, the bit is free to move longitudinally of the screw head slot. The provision of parallel faces avoids any tendency for the bit to climb out of the slot thereby avoiding mutilation of the bit and screw which result from such movement. Each driving face, as will be observed, is of substantial depth and extends substantially the entire length of the bit edge, the two faces extending equal distances in opposite directions from opposite ends of the bit edge.

Since the greatest strain in a blade is upon the ends of the bit, the shoulders 15, 16 provide reinforcement for the driving face at exactly the points where the maximum strain is imposed in use.

Referring to Figures 8 to 11 inclusive, the bit is there shown as embodied in a substantially flat blade of rectangular formation. The stock has side faces 27 and end faces 28, which form a blank substantially rectangular

in cross section. The bit edge 29 extends in a plane substantially diagonal of the cross sectional plane of the blank from the corner 30 to the corner 31. The driving face 32 extends from the corners 30 toward the corners 31, and merges into a laterally directed shoulder 33. The driving face 34 extends from the corner 31 toward the corners 30 and merges into the laterally extending shoulders 35, the two shoulders 33 and 35 reinforcing the opposite driving face.

Referring to Figure 9, it will be observed that adjacent the corners 30 and 31, the stock is not cut away, the outer ends of the driving faces being continuations of the corresponding corners 30' and 31' of the stock forming the shank of the blade. As will be observed from Figure 3, each shoulder 33 and 35 extends laterally from the edge of the blade and reinforces the opposite driving face, and since the edge of the bit is diagonal of the cross sectional plane of the stock, the structure is given increased strength. The structure embodies essentially the features of construction of the form illustrated in Figures 1 to 7 inclusive, and as illustrated in Figure 11, the side faces in a plane spaced above the edge of the bit are of concave formation. The bit may be formed in a milling operation by positioning the stock at an angle to the cutter, as illustrated in Figure 12, or in any other suitable manner.

It will be understood that in both forms, there are provided at opposite sides of the bit edge opposite recesses which are arcuate in cross section, as best shown in Figure 13. The axes of these arcs lie in planes which are parallel to each other and to the bit edge. Also these recesses are inclined oppositely to each other; thus they each incline away from the bit edge in opposite direction. It is also to be observed that in addition to being cross-sectionally arcuate, the recesses are formed on an arc extending lengthwise thereof, or on a longitudinal arc, since they are formed by a rotating tool, the cutting instrumentalities of which move on an arc to produce a corresponding arc in the bit stock.

Obviously, if a driver for removing screws should be found desirable, this may be had by simply reversing the relative locations of the faces.

It will be understood that the structures illustrated and described may be modified without departing from the invention, the characteristic features of which are set forth in the following claims.

I claim:

1. A screw driver bit having driving faces disposed on opposite sides thereof, said faces extending from opposite ends of the bit edge transversely of the bit and each extending the entire width of the bit lengthwise of the bit edge and terminating at substantially the other end of the bit edge in a laterally di-

rected shoulder reinforcing the opposite driving face.

in planes which are parallel to each other and to said edge, said axes being inclined oppositely to each other at equal angles to the longitudinal axis of the bit.

In testimony whereof I have hereunto set my hand.

JAMES L. GRUBE.

2. A screw driver bit having substantially parallel driving faces disposed on opposite sides thereof, said faces extending from opposite ends of the bit edge transversely of the bit and each terminating at substantially the other end of the bit edge in a laterally directed shoulder reinforcing the opposite driving face, each shoulder extending from side to side of the bit lengthwise of the bit end edge at an inclination to the bit end edge.

3. A screw driver bit having driving faces disposed on opposite sides thereof, said faces extending from opposite ends of the bit edge transversely of the bit and progressively decreasing in depth and each of said faces terminating at substantially the other end of the bit edge in a laterally directed shoulder reinforcing the opposite driving face.

4. A screw driver bit having substantially parallel driving faces disposed on opposite sides thereof, said faces extending from opposite ends of the bit edge transversely of the bit and progressively decreasing in depth and each of said faces terminating at substantially the other end of the bit edge in a laterally directed shoulder reinforcing the opposite driving face, each shoulder extending from side to side of the bit lengthwise of the bit end edge at an inclination to the bit end edge, and laterally merging on a curve throughout its length with the adjacent face.

5. The screw driver bit specified in claim 1, the sides of said bit spaced longitudinally of the bit from the bit edge being concaved.

6. The screw driver bit specified in claim 3, the sides of said bit spaced longitudinally of the bit from the bit edge being concaved.

7. A screw driver bit formed from rectangular stock and having its edge extending in a plane substantially diagonal of the cross-sectional plane of said stock.

8. A screw driver bit formed from rectangular stock and having its edge extending in a plane substantially diagonal of the cross-sectional plane of said stock, said edge having opposite parallel driving faces extending transversely of the bit in opposite directions and each terminating in a laterally directed shoulder reinforcing the opposite driving face.

9. A screw driver bit formed from rectangular stock and having its edge extending in a plane substantially diagonal of the cross-sectional plane of said stock, said edge having opposite parallel driving faces extending transversely of the bit in opposite directions and each progressively decreasing in depth and terminating in a laterally directed shoulder reinforcing the opposite face.

10. A screw driver bit having its edge defined by opposite recesses which are arcuate in cross section, the axes of said arcs lying

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