Nov. 24, 1925.

1,563,064

C. A. BEARDMORE

SCREW DRIVER

Filed Dec. 28, 1923

Fig. 1.

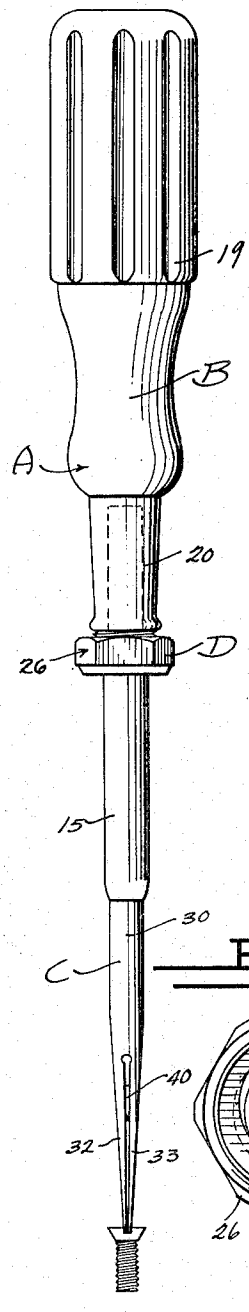


Fig. 2.

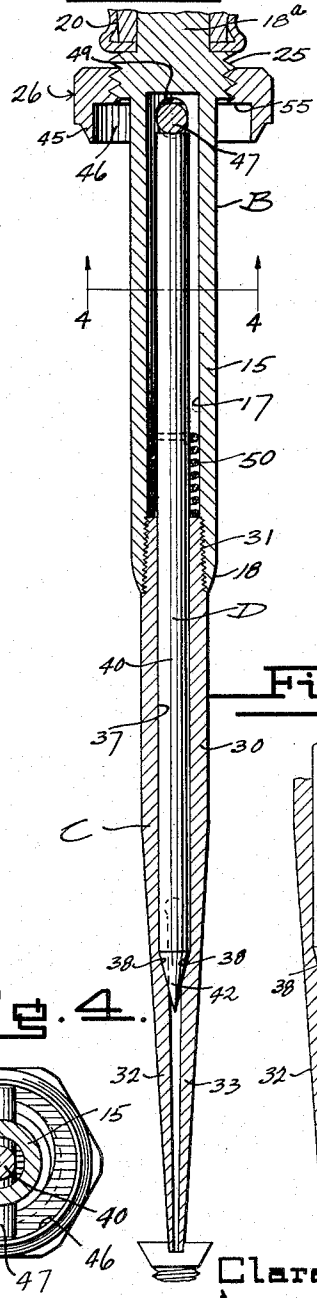


Fig. 3.

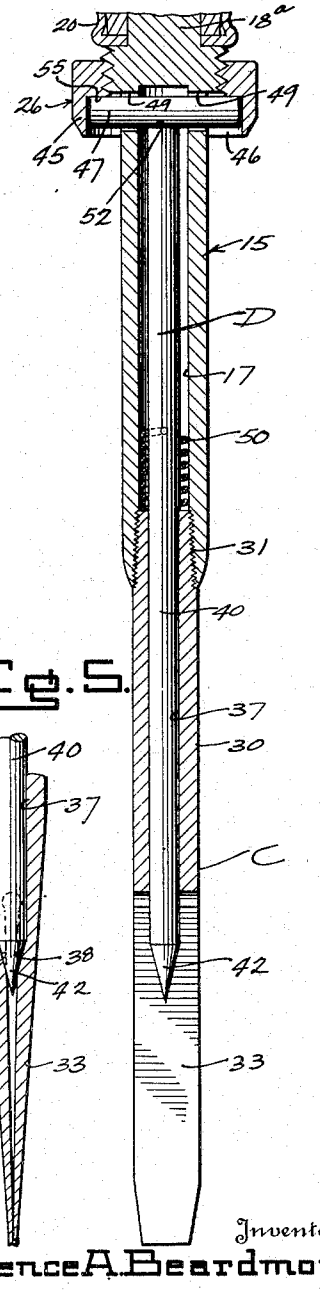


Fig. 4.

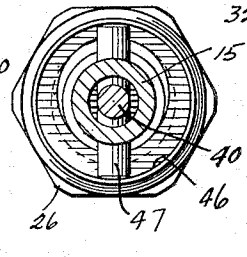
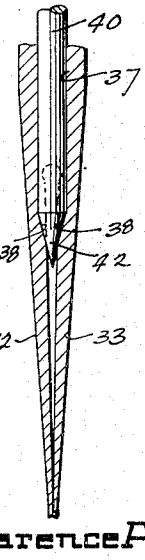


Fig. 5.



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UNITED STATES PATENT OFFICE.

CLARENCE ALBERT BEARDMORE, OF ANNAPOLIS, MARYLAND.

SCREW DRIVER.

Application filed December 28, 1923. Serial No. 683,232.

To all whom it may concern:

Be it known that I, CLARENCE A. BEARDMORE, a citizen of the United States, residing at Annapolis, in the county of Anne Arundel and State of Maryland, have invented certain new and useful Improvements in a Screw Driver, of which the following is a specification.

This invention relates to improvements in screw drivers.

The primary object of this invention is the provision of a screw driver which embodies novel means for holding the screw prior to and during the screw driving operation.

A further object of this invention is the provision of a novel type of screw driver embodying a bit which has a split screw kerf inserting end, and novel means to expand the screw kerf inserting end so that a screw or other element may be supported by the screw driver bit prior to and during the screw inserting operation.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawing, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a side elevation of the improved screw driver, showing the blade ends of the bit thereof in expanded relation for supporting a screw.

Fig. 2 is a fragmentary enlarged cross sectional view taken through cooperating details of the improved screw driver, showing the same holding a screw.

Fig. 3 is a cross sectional view taken through details of the screw driver illustrated in Figure 2, and at right angles to the view illustrated in Figure 2.

Fig. 4 is a transverse cross sectional view taken substantially on the line 4—4 of Figure 2.

Fig. 5 is a fragmentary cross sectional view taken through the bit end of the improved screw driver.

In the drawing, wherein for the purpose of illustration is shown but the preferred embodiment of this invention the letter A may generally designate the improved screw driver, which consists of a handle construction B; bit C; and means D for regulating the bit C so that the same of itself may support a screw element.

In the drawing the handle construction B is shown as consisting of a hollow shank or casing portion 15, which provides a socket or passageway 17 longitudinally therethrough, opening inwardly from the lower tapered end 18 of the same. The shank 15 at the end 18 is internally screw threaded on a taper. At its upper end the shank or casing portion 15 has a solid extension 18^a adapted to receive the hand engaging member 19 thereon, which may be connected thereto in any approved manner, as by a ferrule 20. Just below the ferrule 20, the shank or casing 15 is provided with an annular screw threaded extension 25 adapted to adjustably receive a nut member 26 which forms a part of the bit regulating means D, and as will be subsequently described.

The bit C of the screw driver is of novel construction, and includes a hollow clyindrical shaped body portion 30 which is provided with an externally tapered screw threaded end 31 at the top thereof. The bit C furthermore includes the similarly formed and shaped flat blades or jaws 32 and 33 integrally connected with the body portion 30, and extending downwardly from the body portion 30 in a converging relation. The blades 32 and 33 are so formed upon the body portion 30 that the resilient tendency of the same is to engage each other at the outer or screw kerf inserting ends thereof. These blades 32 and 33 are, of course, formed by longitudinally splitting the bit C inwardly from the chisel end thereof. As can be seen from Figure 5 of the drawing the blades 32 and 33 are tapered from their juncture with the body portion 30 to their relatively engaging free ends, where they provide a chisel edge for engaging in the screw kerf. The body portion 30 of the bit C is provided with a passageway or bore 37 therethrough, which terminates intermediate the ends of the bit C on the beveled seat or seats 38 provided on the facing sides of the blades 32 and 33 adjacent their juncture with the body portion 30.

The bit C is adapted to be inserted at its screw threaded end 31 in the screw threaded socket at the lower end of the hollow shank 15, substantially as is illustrated in the

drawing, and thus the bit C is fixedly connected with the handle construction B.

Referring to the means D for expanding the bit blades or jaws 32 and 33, the same preferably comprises a solid substantially cylindrical shaped pin or expanding member 40, which is slidably disposed through the aligning bores or openings 17 and 37 of the casings 15 and 30 respectively. At its lower end the pin 40 provides a tapered point 42 which normally seats on the seating surfaces 38 of the blades 32 and 33. The nut 26 is adjustable on the screw threaded portion 25 of the handle casing or shank 15, and may by such adjustment be moved longitudinally of the screw driver. This nut 26 is of peculiar formation, providing a depending flange 45 at the outer edge thereof, which forms an open recess 46 facing toward the bit end of the screw driver. A movable cross pin or member 47 is carried by the casing 15 of the handle construction B; being transversely disposed through aligning openings 49 which are provided through the casing 15 within the area of the recess 46, so that the ends of this pin or member 47 extend outwardly from the casing 15 into the recess 46. The pin or member 47 cannot become detached from the screw driver, because of the impedance offered by the annular depending flange 45. Upon adjustment of the nut 26 the pin 47 may be moved longitudinally within the screw driver casing 15, since the openings 49 are of sufficient elongation to permit such movement of the pin 47.

A spiral spring 50 is preferably provided within the bore or passageway 17 of the handle casing 15, at its lower end preferably resting upon and engaging the upper edge of the bit C, and at its upper end having a transverse portion or convolution thereof extending through a suitable opening provided transversely of the expanding pin 40. This spring 50 is normally under compression and urges the expanding member 40 so that the top edge or margin 52 thereof engages the circumference of the transverse pin 47.

Referring to the operation of the improved screw driver, it is to be particularly noted that the bit blades 32 and 33 are a part of the bit C, and they alone engage in the screw kerf for the transmission of power or force to effect the screw driving operation. The normal and inherent tendency of these blades 32 and 33 is to move toward each other so that the chisel edge of the bit C is always in position to be inserted in the screw kerf. Having been inserted in the screw kerf, in order to move the jaws or blades 32 and 33 so that they will engage the side edges of the kerf for supporting the screw independent of manual aid, it is merely necessary for the operator to move the nut 26 for a rotation or part of a rotation upon the shank or casing 15. The nut 26 incident to such rotation will descend, and the bottom surface 55 of the recess 46 will engage the outwardly extending ends of the pin 47 and move the pin 47 downwardly within the openings 49. This movement of the pin 47 will, of course, push the expanding pin 40 downwardly within the screw driver, and against the normal action of the spring 50. The tapered end 42 of the member 40 will thus engage on the beveled seats 38 of the blades 32 and 33, and will expand the bit C at its screw kerf inserting end, by moving the blades 32 and 33 away from each other until their screw kerf inserting ends are expanded into engagement with the side walls of the screw kerf, and will clamp the screw into a supported relation with the bit, as can readily be understood. This expanding action upon the bit blades is effected at a point considerably remote from the screw, thus retaining the resiliency of the blades 32 and 33. It is very apparent that very little movement of the nut 26 is necessary to effect the expanding movement sufficient to clamp the screw to the bit, and there will be no liability of injury to the bit blades because of the fact that unnecessary expanding action thereof is prevented by reason of the limitation of movement of the pin 47 within its openings 49 of the casing 15.

From the foregoing description of this invention it is apparent that a screw driver has been provided which is of a relatively simple nature, and which may be economically produced to perform the function of holding the screw incident to the driving operation. The bit C is fixedly connected to the handle construction of the screw driver, and is not movable rotationally or longitudinally with respect thereto. This is an important feature. While screw threaded connection between the casing 15 and the bit C has been shown, such connection is not necessary in all instances, since a welded connection may be provided in lieu thereof. It is to be particularly noted that the screw shank C directly bears all of the strain incident to the screw driving or removing operation, and the blades 32 and 33 in addition to providing the means for supporting the screw are so arranged with respect to the expanding means as to be of sufficient strength to directly withstand all torsional strains coming thereon.

Various changes in the shape, size, and arrangement of parts may be made to the form of the invention herein shown and described, without departing from the spirit of this invention or the scope of the claims.

I claim:

1. A screw driver comprising a handle construction including a hollow shank, a

nut adjustably carried by said hollow shank, said hollow shank at the upper end thereof having a pair of elongated aligning apertures therethrough, a pin carried by said casing within said apertures so that said pin may be moved longitudinally of the screw driver upon adjustment of the nut into engagement therewith, a bit including a pair of resiliently mounted blades, a member slidable within said bit and within said hollow casing, and spring means normally urging said member into engagement with the nut adjusting pin, said member upon adjustment of said nut adapted to be moved by engagement of said pin therewith to expand said bit blades.

2. A screw driver comprising a bit including a pair of blades which at their screw engaging ends are normally urged into inherently engaged relation, a pin member slidable longitudinally within a passageway provided through said bit, a cross pin movably carried by said bit for sliding longitudinally of the bit into cooperating relation with said pin, and a nut adjustable longitudinally of said bit for engaging said cross pin upon movement of the nut toward the blades whereby to force the same longitudinally of the bit into engagement with said first mentioned pin to move the latter into engagement with the blades for relatively expanding them at their screw engaging ends.

3. A screw driver comprising a handle construction including a hollow shank, a nut adjustably carried by said hollow shank, said hollow shank at the upper end thereof having a pair of elongated aligning apertures therethrough, a pin carried by said casing within said apertures so that said pin may be moved longitudinally of the screw driver upon adjustment of the nut into engagement therewith, a bit including a pair of resiliently carried blades, a member slidable within said bit into engagement with said blades and within said hollow shank, said member upon adjustment of the nut adapted to be moved by engagement of said pin therewith to expand said bit blades.

4. In a screw driver a handle providing a body construction with a central passageway therethrough and having a pair of bit blades connected therewith in inherent resiliently urged engagement at their screw operating ends, a pin slidable in the passageway through said body construction, a cross pin carried by said body construction in bodily sliding relation longitudinally of the body construction and arranged transversely of the body construction in engagement with said pin disposed in the passageway of said body construction, said cross pin providing diametrically opposed ends thereof extending outwardly of the body construction, and a nut adjustably threaded on the body construction in engagement with said cross pin for sliding the latter longitudinally of the screw driver when the nut is rotated in adjustment toward the blades of the screw driver whereby to force the pin along the passageway of said body construction into engagement with said blades to expand the same at their screw operating ends.

CLARENCE ALBERT BEARDMORE.