Nov. 3, 1953 E. H. SHAFF 2,657,724

EXPANDING BIT SCREW DRIVER

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Fig. 1

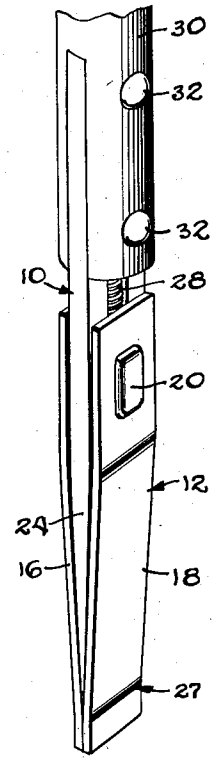


Fig. 2

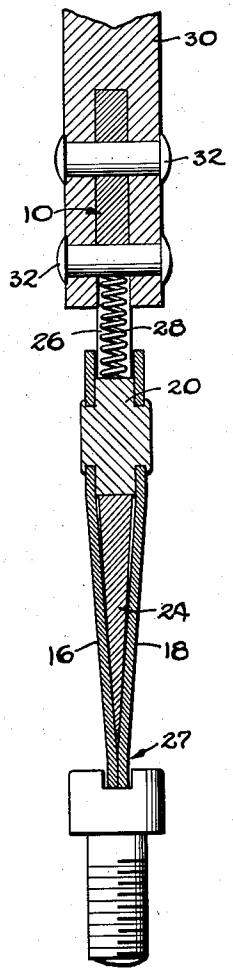


Fig. 3

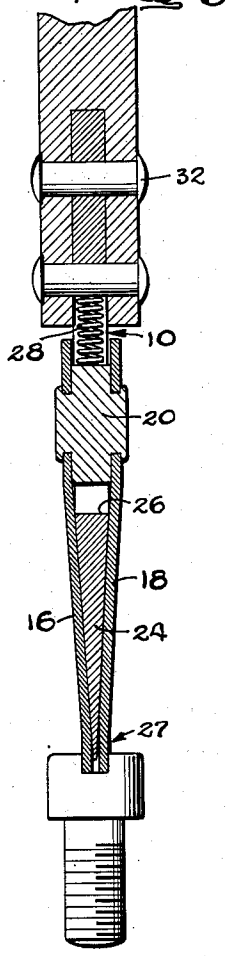
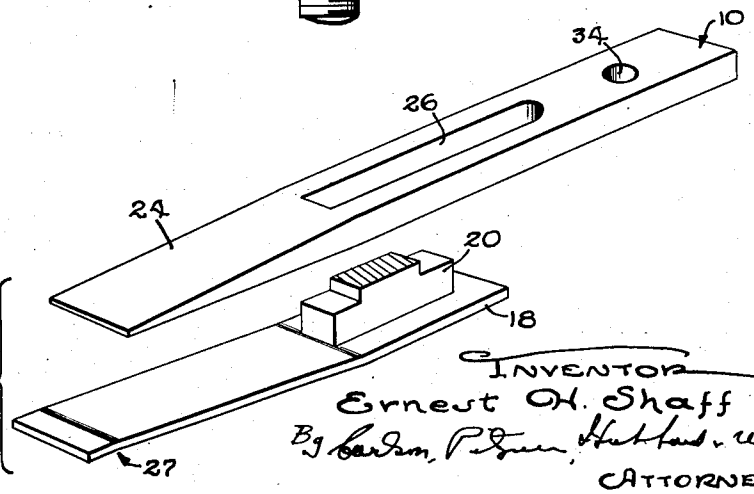


Fig. 4



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EXPANDING BIT SCREW DRIVER

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1 Claim. (Cl. 145—50)

1

The present invention relates generally to screwdrivers and more particularly to screwdrivers of the type adapted to pick up and retain screws for application to the work.

It is a general object of the invention to provide a screwdriver of the foregoing character which may be easily manipulated, is of simple and rugged construction and which permits of economical manufacture.

The object of the invention thus generally set forth together with other objects and ancillary advantages is attained by the construction and arrangement shown by way of illustration in the accompanying drawing, in which:

Figure 1 is a fragmentary perspective view of a screwdriver embodying the features of the present invention.

Fig. 2 is a central longitudinal section through the screwdriver illustrated in Fig. 1 and showing the normal relationship of its parts.

Fig. 3 is a sectional view similar to Fig. 2 but showing the relationship of the parts of the screwdriver upon driving a screw.

Fig. 4 is a fragmentary exploded perspective view of the screwdriver bit shown in the preceding figures.

As illustrated in the drawings, the exemplary screwdriver embodying the present invention includes a supporting member or shank 10 on which is slidably mounted a bit 12. The latter is of generally tapered form and is composed of a pair of blades 16 and 18. The outer ends of these blades form kerf engaging faces. Provision is made whereby such faces can be adjustably spaced so as to enable the bit to be snugly received in screw kerfs of various widths.

Preferably the bit blades 16 and 18 are formed of flat spring steel and are shaped to converge toward the axis of the screwdriver, abutting each other at their outer ends. The inner ends of the blades are held in spaced relation by means of a block 20. The blades are fixed to opposite sides of the block 20 and the block serves to support them on the shank 10.

Adjustable spacing of the outer faces of the tip of the bit 12 is afforded through the provision of means to spread the blades 16 and 18 apart. To this end a wedge 24 having a taper substantially corresponding to that of the blades is interposed between them, and the bit 12 is made movable relative thereto so that the wedge tip can be inserted or withdrawn as desired to vary the spacing of the outer ends of the blades. Preferably, the wedge 24 is formed integral with the shank 10 and the bit 12 is made movable

2

longitudinally thereof. For this purpose, the block 20 to which the inner ends of the blades 16 and 18 are fixed is received in an elongated slot 26 formed longitudinally in the shank 10. Thus the block 20 serves as a carrier for the blades 16 and 18 and engagement thereof with the side walls of the slot 26 serves to guide bit movement with respect to the shank 10.

Preferably, the tip of the bit 12 is formed to provide substantially parallel kerf engaging faces so that full surface engagement between the bit and the walls of the screw kerf obtains. When there is such engagement, danger of camming the bit from the screw kerf is minimized. For this purpose the outer ends of the blades 16 and 18 are bent laterally outward as at 27 to extend parallel to the bit axis. The inner surfaces of the blade tips lie flat against each other.

Interposed between the block 20 and the inner end of the slot 26 is a compression type spring 28. The spring normally serves to bias the bit 12 outwardly with respect to the shank 14 into the position shown in Fig. 2.

The present invention is shown incorporated in a screwdriver of the hand-held type. For this purpose it is provided with a suitable handle 30. To attach the handle 30 to the bit, rivets 32 are used, one of which is received in a hole 34 adjacent the inner end of the shank 10 and the other may be inserted through the inner end of the slot 26. With such a construction, as is illustrated in the accompanying drawing, the inner end of the biasing spring 28 bears against the latter rivet.

Upon inserting the tip of the bit 12 in the kerf of a screw and exerting a force in a direction axially of the screwdriver, the shank 10 is moved forwardly with respect to the bit. Such movement forces the tip of the wedge 24 between the abutting end portions of the blades 16 and 18 and spreads them apart into full surface engagement with the walls of the screw kerf (Fig. 3). The greater the force exerted, the larger will be the wedging action. This results in increased frictional engagement between the outer faces of the tips of the blades 16 and 18 and the walls of the screw kerf. Because of the spring nature of the blades 16 and 18 themselves, the blade tips are constrained to full surface engagement with the kerf walls. Furthermore, because of the elongated tapered form of the bit 12 and the wedge 24, there is a tendency for the wedge to be frictionally held in such position thereby reducing the axial force required to maintain engagement of the bit with the screw kerf. Upon pull-

ing the bit from the screw kerf the spring **28** is effective to return the blades **16** and **18** to normally extended position with respect to the wedge **24**.

Still another advantage flows from this construction. The intimate engagement between the wedge **24** and the blades **16** and **18** provides reinforcement for the blades for substantially their entire length. Therefore, danger of damaging the bit **12** upon application of a severe torsional force is minimized.

A screwdriver constructed in accordance with the present invention also permits of use to pick up a screw from a receptacle and hold it in position for application to the work. To do so, a user merely inserts the tip of the bit **12** in the screw kerf and moves the blade upwardly along the shank **10** against the action of the spring **28** so that the tips of the blades **16** and **18** are spread apart by the wedge **24**. The blade tips are thus spread into frictional engagement with the kerf walls permitting the screw to be seized and held in position for insertion in the work.

I claim as my invention:

A screw driver comprising, in combination a shank having an elongated longitudinally disposed slot therein, a bit including a pair of flat elongated resilient blades, and an axially elongated carrier block disposed within and longitudinally slidable in said shank slot with its sides slidably engaging the sides of said slot to constrain the same to axial movement with respect to said shank, said blades being fixed adjacent their rear ends to said carrier block on opposite sides of said shank and converging toward each other toward their outer ends, said bit being normally outwardly disposed with respect to said shank, an elongated wedge rigid with said shank outwardly of said slot and interposed between said blades to spread said blades apart upon outward axial movement of said shank with respect to said bit, and a spring disposed in said slot inwardly of said block, said spring being compressed upon outward axial movement of said shank with respect to said bit for restoring said shank and bit to their normal relative positions.

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