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GRIPPING SCREW DRIVER

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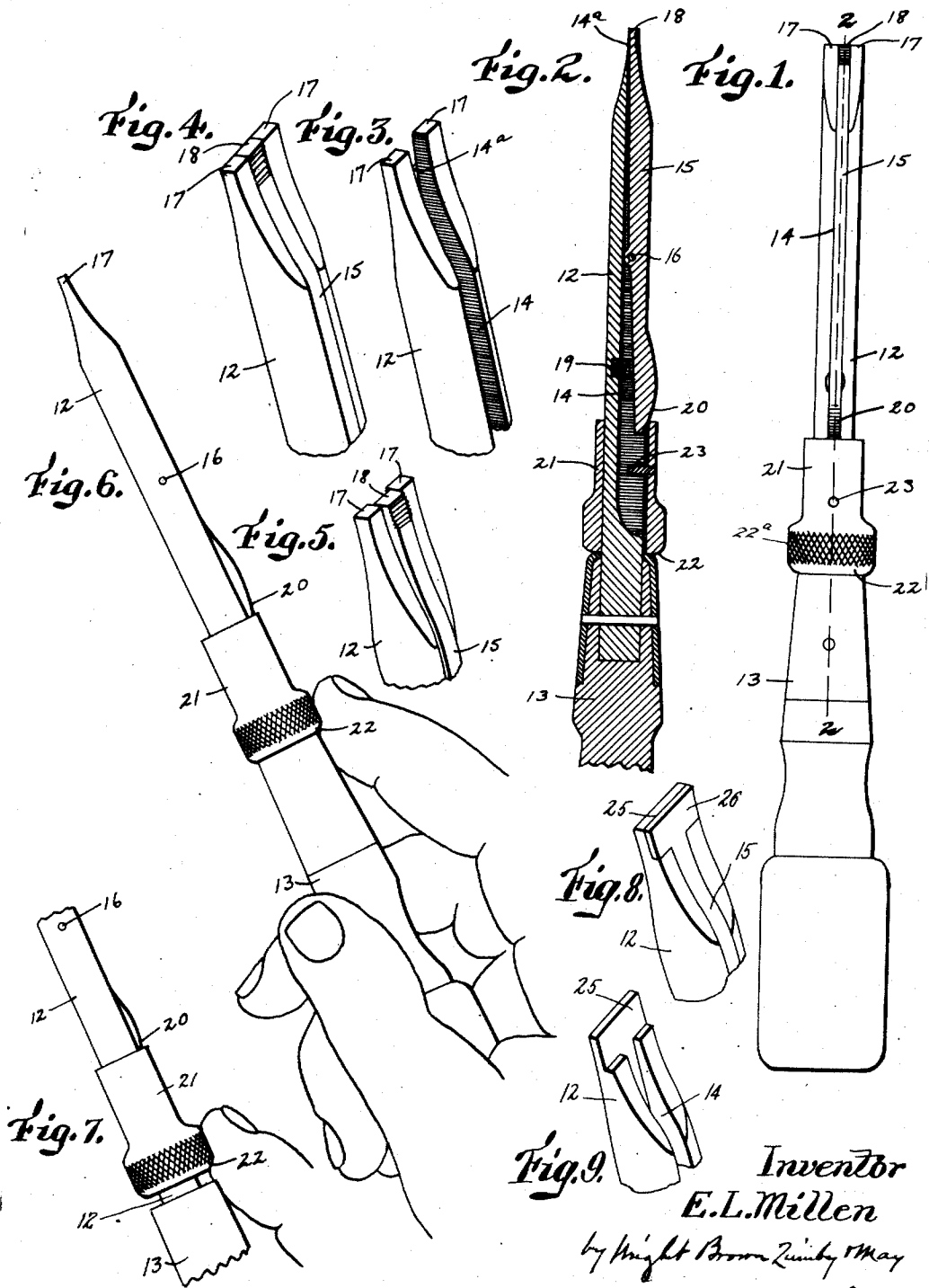


Fig. 9.
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UNITED STATES PATENT OFFICE.

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GRIPPING SCREW DRIVER.

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My invention relates to the type of gripping screw-driver which includes a longitudinally slotted shank, a lever pivoted in the shank slot, the outer ends of the shank and lever constituting members of a bit which is variable in thickness by movements of the lever on its pivot, so that the bit may be thickened to grip the sides of a screw-head slot, the lever being movable by a spring and by a slidable sleeve on the shank.

The invention is embodied in certain improvements hereinafter described and claimed, permitting the convenient manipulation of the lever to thicken the bit and maintain an increased thickness thereof during the operation of driving a screw gripped by the bit.

Of the accompanying drawings forming a part of this specification—

Figure 1 is a side view of a screw-driver embodying the invention.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is an enlarged fragmentary perspective view, showing the outer end portion of the shank.

Figure 4 shows in perspective the portion of the shank shown by Figure 3, and the outer end portion of the lever, the bit having its normal thickness.

Figure 5 is a view similar to Figure 4, showing the bit thickened.

Figure 6 shows the screw-driver as held by the user's hand.

Figure 7 is a fragmentary side view supplementing Figure 6.

Figure 8 is a fragmentary perspective view, showing the outer end portions of the shank and lever and differently constructed bit members formed thereon.

Figure 9 is a view similar to Figure 8, omitting the lever portion.

The same reference characters indicate the same parts in all of the figures.

12 designates a cylindrical shank fixed at its inner end in a handle 13, and provided with a longitudinal slot 14. 15 designates a lever pivoted between its ends in the slot by a pin 16.

In the preferred embodiment shown by Figures 1 to 7, the outer end portion of the shank is cut away at opposite sides to form spaced apart bit members 17, 17, at opposite sides of the slot, one end of the bottom 14^a of the slot 14 being between said members and spaced from their outer ends, as shown

by Figures 2 and 3. The outer end portion of the lever 15 constitutes a bit member 18, located between the members 17.

A spring 19 (Figure 2) located in the slot 14 acts on the inner end portion of the lever 15 to normally hold the lever in the position shown by Figure 2, the bit member 18 bearing on the bottom 14^a of the slot, and its sides being flush with the sides of the members 17, as shown by Figure 4, so that the bit has a minimum thickness and is adapted to somewhat loosely enter a screw-head slot. The inner end portion of the lever is spaced from the bottom of the slot, so that the lever is movable on its pivot 16, to thicken the bit by moving the member 18 out of alignment with the members 17, as shown by Figure 5, thus causing the bit to grip the sides of a screw-head slot in which it is inserted.

On the inner end portion of the outer edge of the lever 15, is formed an inclined face 20, with which a sleeve 21, slidable on the shank, cooperates to cause the bit-thickening movement of the lever. The length of the sleeve is such that when it is fully retracted, one of its ends abuts the inner end of the handle, as shown by Figures 1, 2 and 6, and the opposite end receives and bears on the extremity of the face 20, and permits the lever to assume its normal position, reducing the bit to its minimum thickness, the major portion of the face 20 being outside the sleeve. The inclination of said face is so abrupt that a slight projection of the sleeve from the position shown by Figure 6, to that shown by Figure 7, is sufficient to move the lever to the bit-thickening position indicated by Figure 5.

To permit the described projection of the sleeve by the fore-finger of a hand grasping the handle, I provide the outer end portion of the sleeve 21 with a peripheral enlargement forming a shoulder 22, which projects outwardly from the end of the handle against which the sleeve abuts when retracted. The form and outward projection of the shoulder 22 are such that the tip of the fore-finger of a hand operatively gripping the handle may bear on the shoulder and be caused by a slight outward movement of the finger tip to project the sleeve, as indicated by Figure 7, and hold the sleeve thus projected while turning the tool to drive a screw.

Because of the fact that only a slight projection of the sleeve is required, the em-

ployment of the forefinger to project the sleeve does not weaken the grip of the handle by the operating hand, the position of the other digits of the hand relative to the handle being the same, whether the forefinger be extended or not. The tool may, therefore, be operated as conveniently and effectively in driving a screw gripped by the bit, as in driving a screw not thus gripped. Moreover, the extended forefinger exerts supporting pressure on one side of the tool, while it is being turned, this pressure being opposed to that exerted on the opposite side of the tool by the thumb and other digits.

The sleeve enlargement extends entirely around the sleeve, so that the shoulder 22 is annular and projects outwardly from the entire periphery of the end of the handle against which the sleeve abuts. Said enlargement has a knurled peripheral face 22^a on which a portion of the finger tip may bear, as shown by Figures 6 and 7.

The sleeve is provided with a pin 23, projecting into the slot 14 and adapted to bear on a side of the slot, so that when the forefinger is extended and the operating hand is turned in driving a screw, the extended forefinger imparts a turning movement to the sleeve which acts through the pin 23 on one side of the slot to assist in the turning of the tool.

The pin 23 is adapted to cooperate with the end of the lever which projects into the sleeve, in limiting the projection of the sleeve, so that the latter cannot move entirely over the inclined face 20 and be removed from the shank, the pin being arranged to abut the end of the lever when the sleeve has been projected somewhat beyond the position shown by Figure 7, provision being thus made for imparting to the bit a greater thickness than that shown by Figure 5, before the projection of the sleeve is arrested.

The bit may be composed, as shown by Figures 8 and 9, of a flat-sided member 25,

formed on the outer end of the lever 15, the length of each of said members being equal to the diameter of the shank. The member 25 is preferably thicker than the member 26. When said members are pressed together by the spring, they form a relatively thin bit, and when the member 26 is moved away from the member 25, the outer sides of the members form the sides of a thicker bit. The bit thus formed has continuous sides adapted to have extended bearings on the sides of the screw-head slot.

I claim:

A gripping screw-driver comprising a handle, a shank fixed thereto, a lever pivoted between its ends in a longitudinal slot in the shank, and having an abruptly inclined face on its inner end portion, said shank and lever having reduced outer end portions constituting members of a bit which is variable in thickness by movements of the lever on its pivot, a spring acting on the lever to normally hold the outer end thereof against the outer end of the slot bottom, so that the bit normally has a minimum thickness, and a sleeve interposed between the handle and the inner end of the lever and movable on the shank to a retracted position with its inner end abutting the handle, and its outer end receiving a limited portion of the inclined face of the lever, the inner end of the sleeve being provided with a peripheral enlargement entirely surrounding the sleeve and having a finger tip-engaging periphery projecting outwardly from the entire periphery of the end of the handle against which the sleeve abuts, the sleeve being provided with a pin projecting into the shank slot and adapted to exert a shank-turning pressure on a side of the slot, and to cooperate with the inner end of the lever in limiting the projection of the sleeve.

In testimony whereof I have affixed my signature.

EDWARD L. MILLEN.