Sept. 20, 1949. H. R. LAND 2,482,348

FOLDING HANDLE FOR SCREW DRIVERS OR THE LIKE

Filed June 13, 1947

Fig. 1.

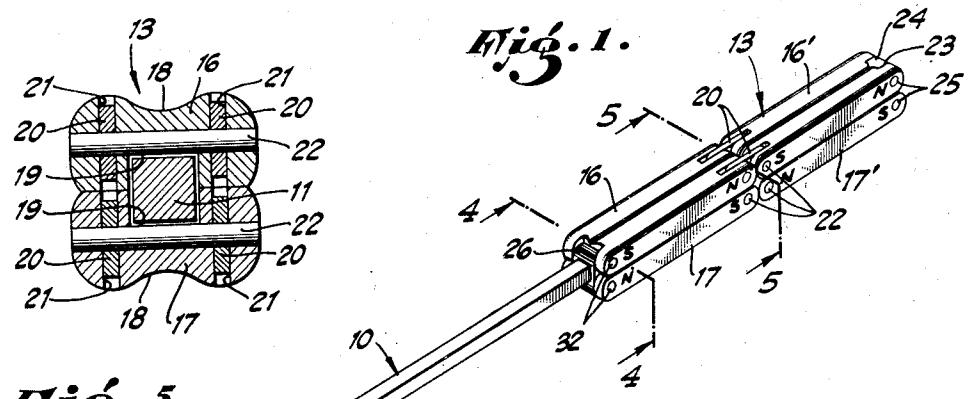


Fig. 5.

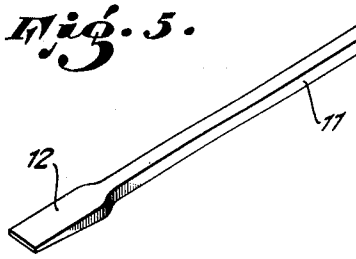


Fig. 2.

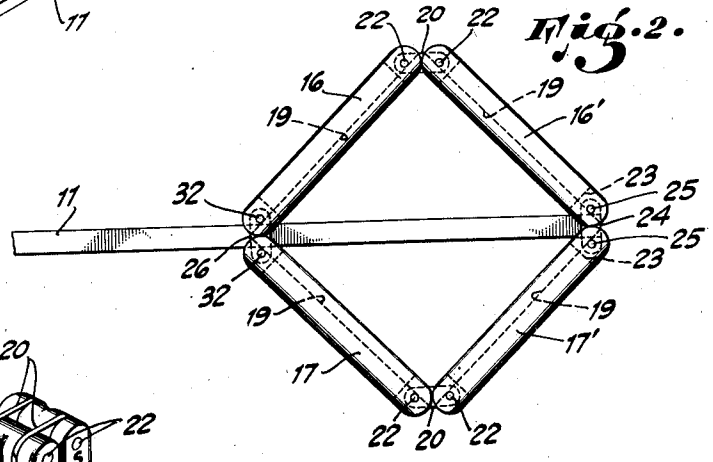
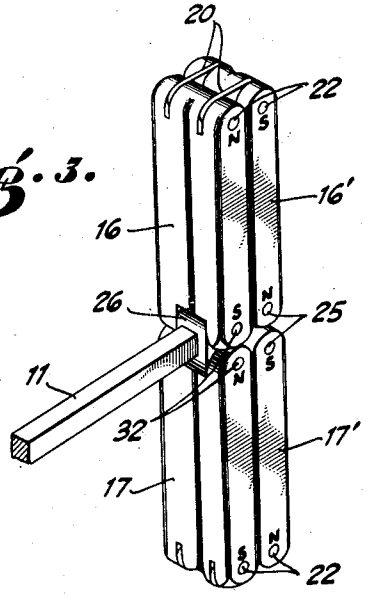


Fig. 3.



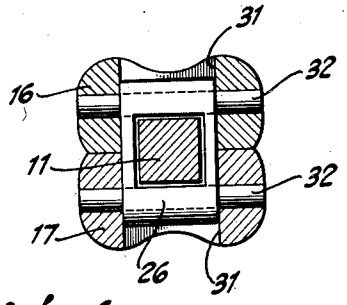


Fig. 4

Inventor.

Herbert R. Land,

By Ernest J. Lilly

Attorney.

Patented Sept. 20, 1949

2,482,348

UNITED STATES PATENT OFFICE

2,482,348

FOLDING HANDLE FOR SCREW DRIVERS OR THE LIKE

Herbert R. Land, Van Nuys, Calif.

Application June 13, 1947, Serial No. 754,513

2 Claims. (Cl. 145—50)

1

The present invention relates to screw drivers or the like, and the principal object of the invention is to provide a new and improved handle for tools of this class which can be changed quickly and easily from a normal position, coaxial with the shank of the screw driver, to a right-angled position providing greatly increased leverage, for driving screws which turn with considerable difficulty. The advantage of this arrangement is that with the handle in the normal position, the screw driver can be turned with greater ease and rapidly to drive freely turning screws than can be done when the handle is in the right-angled position, whereas when the handle is in the latter position, a much greater torque can be applied to the screw driver to tighten or loosen screws requiring a greater turning effort, than can be exerted when the handle is in its normal position. Thus, the handle can be changed at will to whichever position is the more advantageous, depending upon the turning effort required to drive the screw.

Another object of the invention is to provide a handle which can be changed from either one of the two positions described to the other by merely sliding the lower end portion of the handle up or down along the shank of the screw driver. This enables the change to be made very quickly and without requiring the use of tools.

A further object of the invention is to provide a screw driver handle comprising two pairs of members disposed on opposite sides of the shank, which are movable between a first position wherein the members of one pair are contiguous to one another, and in which the members are held together in either of said positions by the force of magnetic attraction. This object is attained by making the handle members of bar magnets which are oriented so that the adjacent ends of contiguous members are of opposite polarity when the members are in either of said positions, and are thereby mutually attracted together.

Other objects and advantages of the invention will become apparent to those skilled in the art upon consideration of the following detailed description of the preferred embodiment thereof, reference being had to the accompanying drawings, in which:

Figure 1 is a perspective view of a screw driver having a handle embodying the principles of the invention, showing the handle in its normal position;

Figure 2 is an elevational view of the handle,

2

showing the latter in an intermediate position between its normal and right angled positions;

Figure 3 is a fragmentary perspective view, showing the handle in the right angled position;

Figure 4 is an enlarged sectional view taken along the line 4—4 in Figure 1; and

Figure 5 is an enlarged sectional view taken along the line 5—5 in Figure 1.

In the drawings, the screw driver of the invention is designated in its entirety by the reference numeral 10 and comprises a shank 11 having a screw-engaging portion 12 at one end thereof, and a handle 13 at its other end. The shank 11 is preferably, although not necessarily, square in cross-section, and the screw-engaging portion 12 may be either a conventional screw driver blade, as shown, or it might take any other desired form to engage and drive screws having special driving connections. For example, a socket might be used to engage the head of a screw-threaded bolt to drive the same.

The handle 13 comprises two pairs of elongated, rounded-end members 16, 16' and 17, 17' disposed on opposite sides of the shank. These members are generally rectangular in cross-section, and are preferably made approximately twice as wide as they are high, so that when any two of them are brought together face-to-face, as shown in Figures 1 and 3, the resulting handle is generally square in cross-section. The edges of the members are rounded off to make the handle easier and more comfortable to grasp, and the outer or back surfaces of the members may be fluted longitudinally, as at 18, to give a better non-slip grip. The undersides of the members are formed with longitudinally extending, rectangular grooves or channels 19 of slightly greater width and approximately one-half the depth of the shank 11, so that when two opposite members are brought together in the normal position of Figure 1, their respective channels cooperate to form a square hole which receives the shank, enabling the portions of opposite members on either side of the shank to come together.

The two members of each pair are arranged end-to-end, and their adjacent ends are joined together by a pair of laterally spaced links 20 which are disposed on either side of the shank 11 in slots 21 formed in the ends of the members. The members 16, 16', 17, and 17' are connected to the links 20 by transversely extending pins 22 which are inserted through alined holes in the members and links. The distance that the pins 22 are spaced apart is such that when the

members 16, 16', 17 and 17' are in the normal position shown in Figure 1, the two members of each pair are substantially abutting end-to-end, and when the members are in the right-angled position shown in Figure 3, they are parallel to and in contact with one another.

The upper or free ends of the two top members 16' and 17' are slotted at 23 to receive the laterally projecting ends of a cross head 24 which is welded or otherwise rigidly fixed to the top end of the shank 11, and are pivotally connected thereto by pins 25 extending parallel to pins 22. Slidably mounted on the shank 11 is a generally rectangular slide member 26 having a hole formed therein of the same cross-sectional shape as the shank. In the illustrative embodiment, both the hole and shank 11 are square, so that the slide member 26 is provented from rotating with respect to the shank, although any other method of keying the slide to the shank to prevent relative rotation might be used to equal advantage. The projecting ends of the slide member 26 are disposed within slots 31 formed in the lower ends of the two bottom members 16 and 17, and are pivotally connected thereto by pins 32.

When using the screw driver with screws that turn freely, the handle 13 is employed in the normal position, shown in Figure 1, which is the more convenient and comfortable position for rapid and sustained operation. As the screw becomes more difficult to turn, however, the operator merely grasps the lower end of the handle adjacent the slide 26, and pulls upwardly on the same, folding the members 16, 16', 17 and 17' through the intermediate position of Figure 2 to the oppositely extending, right-angled position shown in Figure 3. In this position, with the axis of the handle perpendicular to the axis of the shank, a much greater leverage is obtained, and the hard-turning screw can then be driven with ease. When the screw has been driven up tight and the operator is ready to start driving another screw which turns freely to begin with, the handle 13 can then be returned to its normal position by merely pulling the slide ends of the members 16 and 17 down to the extended position.

A second aspect of the invention has to do with a novel and effective means for holding the handle in either of its two positions, although it will be evident that the invention as described thus far is complete in itself and fully operative. In order that the handle may be firmly yet yieldingly held in either of its two positions, the members 16, 16', 17 and 17' may be made of permanent bar magnets which are oriented so that when the members are positioned either alongside the shank or perpendicular thereto, the ends of the members at the midpoint of the handle on one side thereof are of opposite polarity to the corresponding ends of the members on the other side, and are mutually attracted together to hold the handle in the selected position. This condition is illustrated by the designation of the opposite poles of each bar magnet by the letters S and N. Thus it will be noted in Figure 1 that

the N pole of member 16 is opposite the S pole of member 17, while the S pole of member 16' is opposite the N pole of member 17'. When the handle is in its right angle position as shown in Figure 3, the S pole of member 16 is opposite the N pole of member 16', and the N pole of member 17 is opposite the S pole of member 17'. In both cases, the magnetic attraction of the opposite pole is sufficient to hold the contiguous members together, and thereby hold the handle in one or the other position. The force of magnetic attraction can, of course, be easily overcome by merely grasping the center portions of the handle with the hand and pulling the same apart.

While I have shown and described in detail what I consider to be the preferred form of my invention, it will be understood that various changes may be made in the shape and arrangement of the several parts without departing from the scope of the broader claims, appended hereto.

I claim:

1. A screw driver comprising a shank having a screw-engaging portion at one end thereof, and a handle at the other end, said handle comprising two pairs of elongated members disposed on opposite sides of said shank, the members of each of said pairs being arranged end-to-end, link means pivotally connecting the adjacent ends of the members of each of said pairs to permit relative swinging movement thereof in a plane including the longitudinal axis of said shank, one of the members of each of said pairs being pivotally connected at its free end to said other end of said shank, a slide non-rotatably and slidably mounted on said shank, the other of the members of each of said pairs being pivotally connected at its free end to said slide, said pairs of members being adapted to be extended so as to lie alongside said shank to form a handle having its axis parallel to the axis of the shank for the rapid driving of freely turning screws, or folded so as to extend in opposite directions to form a handle having its axis perpendicular to the axis of the shank, whereby a high torque can be applied to the screw.

2. A screw driver as defined in claim 1, wherein the said handle members are formed of permanent bar magnets which are oriented so that when said members are positioned either alongside said shank or perpendicular thereto, the ends of the members at the midpoint of the handle on one side thereof are of opposite polarity to the corresponding ends of the members on the other side, and are mutually attracted together to hold said handle in the selected position.

HERBERT R. LAND.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,175,902	Peterson	Mar. 14, 1916
1,473,186	Johnsgaard	Nov. 6, 1923