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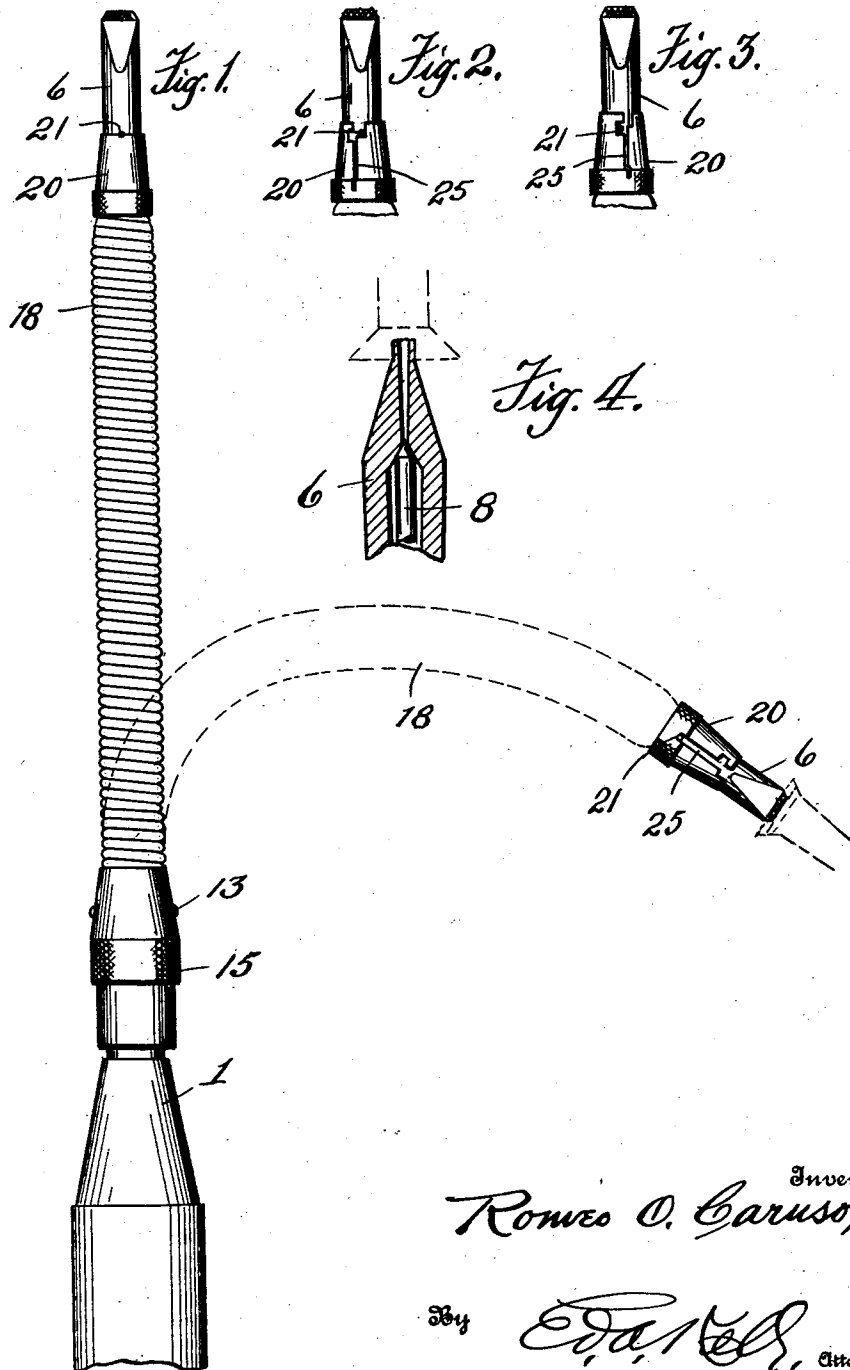
1,624,530

R. O. CARUSO

SCREW DRIVER

Filed Feb. 23, 1926

2 Sheets-Sheet 1



Inventor
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April 12, 1927.

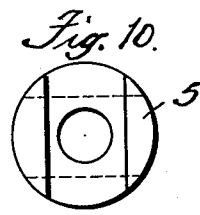
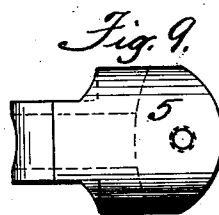
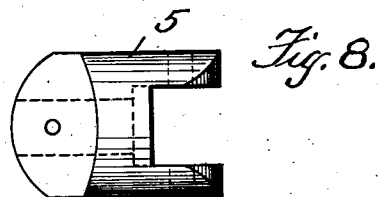
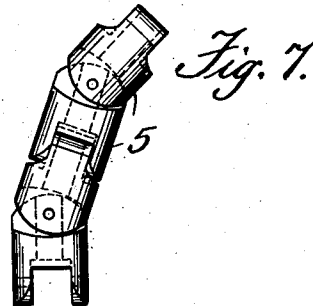
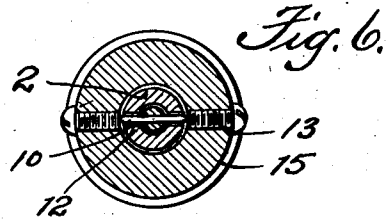
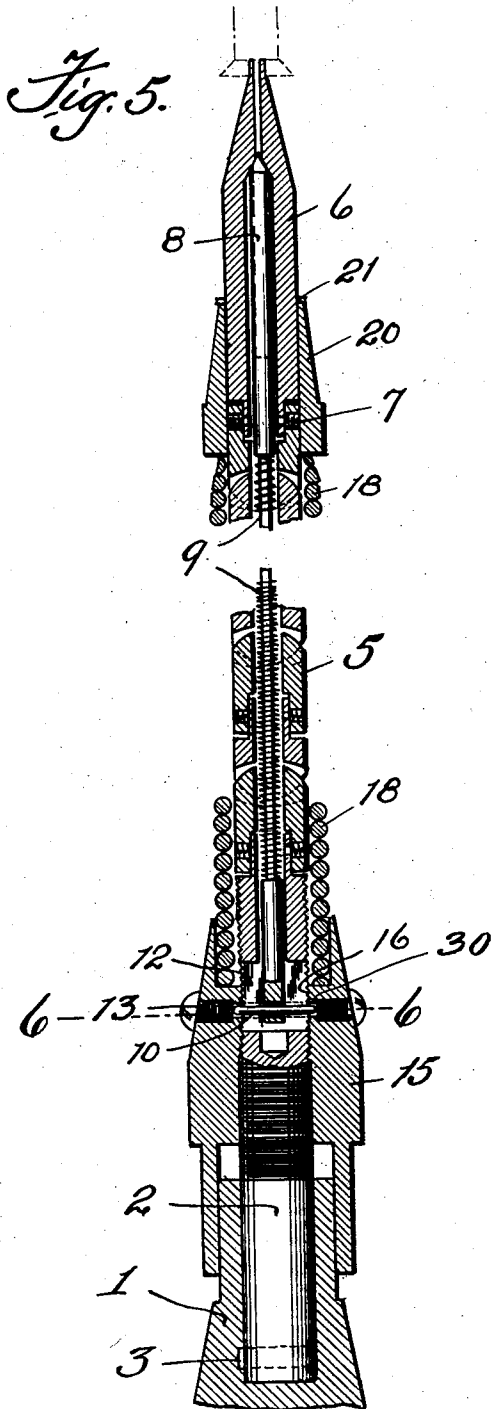
R. O. CARUSO

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SCREW DRIVER

Filed Feb. 23, 1926

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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SCREW DRIVER.

Application filed February 23, 1926. Serial No. 89,871.

This invention relates to improvements in screw-drivers and the object in the present instance is to provide a tool of this character, in which screws may be held by the bit

5 while being inserted into the wood and released when driven home; one in which screws of different sizes, that is screws in which the bit-engaging slots are of different widths, may readily be engaged by the bit; 10 and one in which a screw may be so held while the stem of the screw-driver is straight and rigid, or while it is flexed to drive a screw at an angle to the axial line of the handle.

15 The invention contemplates a device which may be used as an ordinary rigid screw driver or as a flexible or flexed screw driver, and which may be made to hold a screw by its bit in any position to which it is possible 20 to flex the stem, and to drive the screw while in any such position.

The invention consists of a rotatable sleeve located on the handle, the turning of which will rapidly convert the rigid tool into a 25 flexible one, and of a bifurcated spring screw engaging bit at the opposite end of the bit, and means attached to and actuated by the handle, for expanding the split portion of the bit, in addition to a slotted sleeve member 30 through which the extent of expansion of said bit members may be regulated.

The invention is more fully described in the following specification and clearly illustrated in the accompanying drawings, in 35 which:—

Fig. 1 is an elevational view of my device, showing in dotted lines, one of the positions assumed when flexed.

40 Figs. 2 and 3 are detail views of the bit and the regulating sleeve in different positions.

Fig. 4 is an enlarged, sectional view of the end of the bit, showing it expanded and engaging a screw.

45 Figure 5 is a central, vertical, sectional view of the complete device, broken away for purposes of illustration.

Fig. 6 is a cross-section through 6—6 of Figure 5.

50 Fig. 7 is a detail view showing several of

the links which go to make up the flexible stem member.

Figs. 8, 9 and 10 show one of the links in detail.

The numeral 1 designates the handle to 55 which is rigidly attached a stem 2, held against rotation in the handle by a key 3.

To the upper end of the stem is attached the lowermost link of the flexible stem member which is made up of a number of links 5, 60 as best illustrated in Figure 7.

To the uppermost link of this flexible member, is attached a screw-engaging bit 6, held in position by a pair of oppositely disposed screws 7. The bit is bifurcated, as 65 shown in Figures 1 and 4 and its extremities are capable of being expanded after being placed in engagement with the screw slot to hold the screw while it is being inserted. This bit has a central longitudinal 70 opening in which an expanding mandrel 8 moves. This mandrel is carried on the upper end of a flexible stem 9 which is surrounded by a coil spring, the object of which is to help prevent any angular bending or 75 "buckling" of the stem, and said stem 9 depends through the hollow flexible link member and its lower extremity has a perforation through which a pin 10 passes. This pin is slightly greater in length than the diameter 80 of the stem 2, and it is adapted to move up and down in a vertical slot 12 in said stem 2. This pin is inserted through one of the openings occupied by the screws 13, and it is held therein by said screws. 85

The numeral 15 designates a rotatable sleeve, located on the end of the handle where it is mounted loosely, and it is screw-threaded internally at 16 to engage the threaded surface of the stem 2. The upper 90 end of the sleeve is formed with a pocket to receive the end of a coiled spring member 18, which latter serves as a casing for the flexible members 5 and 9. This sleeve is formed with an internal annular groove 30, 95 at the point where the screws 13 enter it and where the pin 10 is located, which pin, being slightly longer than the diameter inside the stem, will engage the groove at both its ends, so that, the turning of the sleeve 15

will cause the stem 9, through which the pin passes, to move up and down in the casing.

Before attempting to convert the device from one position into another, it is first necessary to rotate the sleeve 15, to lower it on the handle, which action will release the pressure on the coiled member 18 and allow it to flex freely and also bring down the stem 9 and the mandrel 8.

Located near the base of the split bit member 6, and slidably mounted thereon, is a sleeve 20 and projecting from two oppositely disposed points on the surface of the bit, are two pins 21. The sleeve is formed with a series of notches in its upper edge, adapted for engagement by these pins. One pair of notches, shown in Figure 1, engage the pins when the sleeve is in normal position, that is, when the bit is closed. The position shown in Figure 2 is the one assumed by the pins when the bit is to be only partially expanded or opened, to engage a screw with relatively narrow slot, while the position shown in Figure 3, with the sleeve in relatively low position, will permit the split bit members to open farther.

The slot 25 in the sleeve 20 extends to a point near its base, and, when it is desired to remove the bit from the stem 5, for the purpose of replacing it with another one, the sleeve may be slipped up on the bit, thus exposing the screws 7 by means of which it is attached to the said stem 5.

It will therefore be noted that when the sleeve 15 has been lowered on the handle, not only will the coiled member be free to flex, but this lowering of the sleeve 15 will also draw the stem 9 and the mandrel 8 down and permit the adjusting sleeve 20 to be placed in proper position with regard to the pins 21 and that, when the sleeve 15 is turned in the opposite direction, the mandrel will be forced up into the split bit

members and expand them to an extent determined by the location of the pins 21 in said sleeve slots, as above described.

The extremities of the split bit are slightly roughened as indicated, to insure a firm engagement with the screw slot.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a flexible screw driver, the combination of a handle, a stem rigidly attached thereto by a key, a flexible link member attached to the end of said stem, said flexible member being made up of a number of links, a removable screw-engaging bit attached to the opposite end of said flexible link member, said bit being bifurcated and capable of being expanded, an expanding mandrel within the bit, a flexible stem on which the mandrel is carried, a rotatable sleeve on the handle in engagement with said flexible link member, a coiled spring member forming a casing for the flexible link member and the flexible stem, an adjusting sleeve located on the lower end of the bit, said sleeve being capable of determining the degree of expansion allowed the bifurcated end of the bit.

2. In a flexible screw driver, a handle, a stem rigidly attached thereto, a flexible link member attached to the stem, a bifurcated expansible bit attached to the opposite end of the flexible link member, a mandrel to expand the bit, a flexible stem on which the mandrel is carried, a rotatable sleeve engaging the flexible link member, a coil spring forming a casing for the flexible link member and the flexible stem, and a sleeve on the bit to determine the degree of expansion allowed the bit.

In testimony whereof I affix my signature.

ROMEO O. CARUSO.