

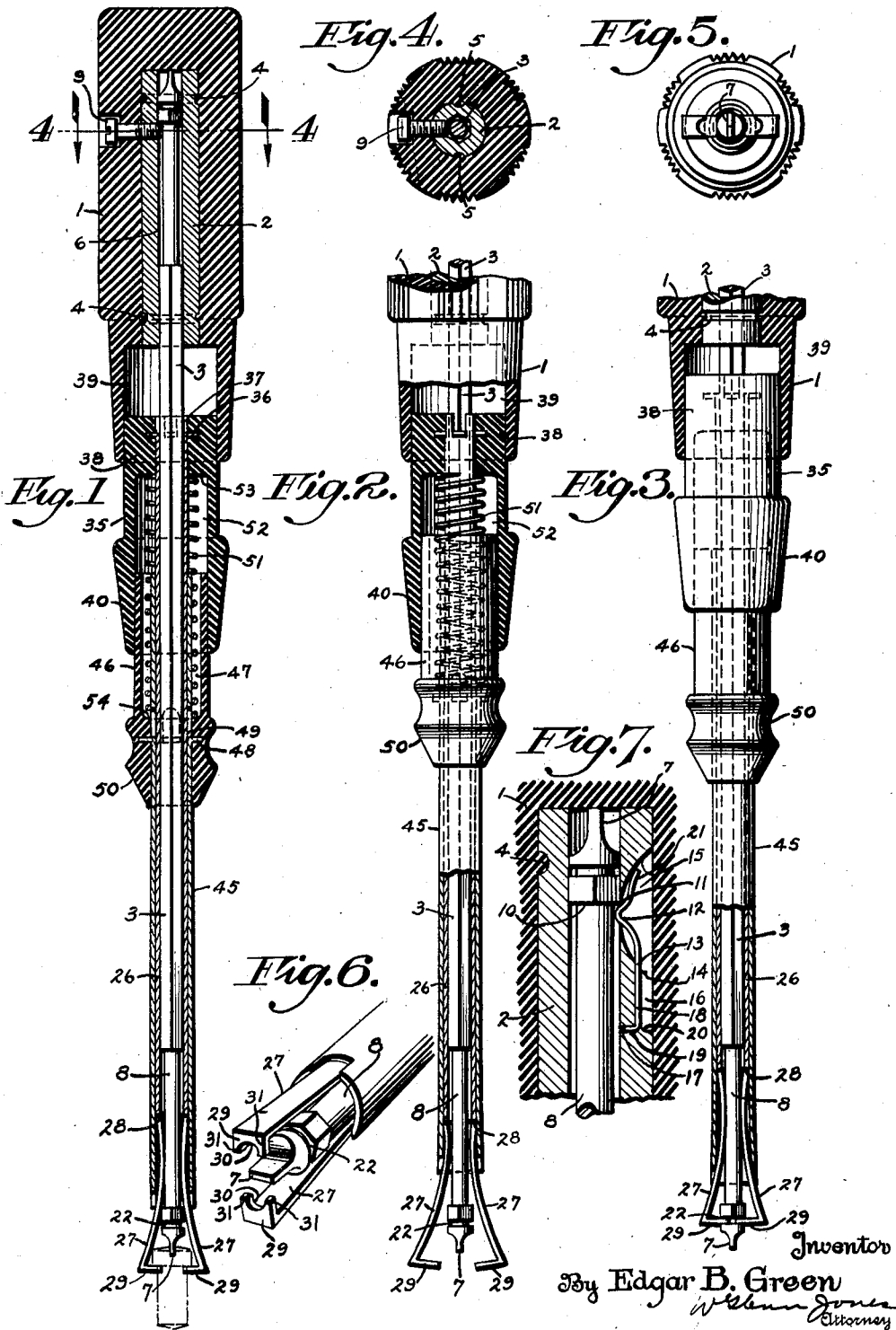
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COMBINATION SCREW DRIVER AND RETRIEVING TOOL

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COMBINATION SCREW DRIVER AND
RETRIEVING TOOL

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1 Claim. (Cl. 145—52)

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This invention relates to a combination screw driver and retrieving tool, and has for an object to provide a screw driver having in combination therewith a pair of controllable spring jaws which will serve to grasp the head of a screw and hold it in position either for inserting the screw or for removing the screw from a location which is not easily accessible, as, for instance, when inserting or removing a screw in a sub panel accessible only through a small hole in a front panel.

A further object of this invention is to provide a combination screw driver and spring jaws thereon which may be used to grasp a washer of usual proportions fitted around the screw, thereby making it possible to remove or apply the washer and the screw in the same operation.

Still a further object of this invention is to provide a spring jawed screw holder which may be detached from the combination tool and used separately or as a retrieving tool for nuts, washers, screws, or other small machine tools.

Still a further object of this invention is to provide a combination tool consisting of a screw driver and a retriever which may be used either separately or in combination, and furthermore, wherein the handles of both the screw driver and the retrieving tool are of dielectric or insulating material so as to make the combination tool or the individual parts thereof safe for operation on electric work.

With the foregoing and other objects in view, the invention consists in the construction, combination and arrangement of parts hereinafter described and illustrated in the drawing, in which:

Fig. 1 is a vertical longitudinal section through the combination tool of this invention, showing the same in operative adjustment;

Fig. 2 is a fragmentary elevational view partly in section with the jaws in wide open adjustment;

Fig. 3 is a view similar to Fig. 2, with the jaws closed upon the driver head;

Fig. 4 is a sectional view on line 4—4 of Fig. 1;

Fig. 5 is a bottom plan view of Fig. 2;

Fig. 6 is a detailed perspective view of the jaws in open adjustment; and

Fig. 7 is a detailed vertical sectional view showing a modified form of securing the driver in the handle.

There is shown at 1 the screw driver handle made of phenolic or other dielectric material in which is embedded a sleeve 2 for lodging or an-

choring the upper end of the screw driver bar 3. The sleeve 2 is provided with circumferential grooves 4 and longitudinal grooves 5 into which the material of the handle 1 may flow during molding to secure the handle 1 and sleeve 2 into an integral unit. The sleeve 2 is provided with a hexagonal bore 6 to receive the correspondingly shaped shank of the driver bar 3. Formed at each end of the driver bar 3 are the driver blades 7, the blades being of different sizes so that either end may be used according to the size of the screw being operated upon. Between the blades 7 and the shank of the screw driver bar 3 there is provided a counter turned portion 8 ending in a shoulder 10, the counter turned portion 8 cooperating with the holding means for securing the driver bar 3 in the handle 1. In Fig. 1 this holding means consists of a screw 9 threaded through a threaded aperture in the side of the sleeve 2 so as to base beneath and hold against the shoulder 10 of the driver bar 3, the head of the screw 9 being suitably countersunk within the handle 1 so as not to interfere with a comfortable grip thereon.

In Fig. 7 an alternative holding means is shown. In this figure the side 11 of the bight 12 of a detent spring 13 bears against the shoulder 10 of the driver bar 3. This detent spring 13 is lodged in a slot 14 of compound formation comprising an arcuate slotted portion 15 wherein the milling cutter was fed in just deep enough to provide a communicating opening through which bight 12 of the spring 13 may operate. This slot 14 also has a longitudinally extending portion 16 into the far end of which communicates a drilled hole 17 which receives and acts as an anchor for the tip end 19 of an elongated shank portion 18 of the detent spring 13, this tip end 19 being offset at a right angle to its shank portion 18. When being assembled the offset tip end portion 19 is forced into the drilled hole 17 and a lip 20 is formed by swaging a portion of the metal at the lower end of the elongated slot 16 over the corner of the end of the spring 13. The other end portion 21 acts in a guiding capacity during actuation thereof.

The driver ends of the bar are also provided with circumferential slots 22 located between the blade ends 7 and the shoulder 10, these slots 22 cooperating with the retriever bar of this combination tool. The retriever portion of this invention comprises a spring jaw sleeve 25 provided at its lower end with jaws 27 of flat cross-section and arcuately shaped from shoulders 28 down to the inwardly extended end clutching

jaws 29, the arcuate spring portion 27 of the jaws being so shaped that the jaws 29 tend to spring outwardly. The jaws 29 are each provided with a semi-circular recess portion 30 leading tooth projections 31 which act to grip the article when the retriever is used for retrieving purposes. The same circumferential openings 30 grip about the shank of a screw just below its head when the screw driver blade is inserted into the slot of the screw head. When the retriever is not in use and the tool is either being stowed away or used solely as a screw driver, the openings 30 enable the jaws 29 to be held tightly against the screw driver around the groove 22 of the driver bar 3.

The upper end of the jaw sleeve 26 is embedded in a molded knob sleeve 35 of insulating material, ears 36 being struck out, leaving cut-outs 37 near the top of the jaw sleeve 26, and are embedded in the molded material, aiding in integrally uniting the jaw sleeve 26 to the knob sleeve 35, the knob sleeve 35 thus acting as a handle for the jaw sleeve 26. The shank 38 of this handle or sleeve 35 telescopes within a bore 39 provided in the lower end of the handle 1 and acting as a guide-way for the shank 38. The lower end of the handle or jaw sleeve 35 is provided with an outwardly extending knob 40, thus enabling the handle of sleeve 35 to be manually manipulated. Circumferentially surrounding the jaw sleeve 26 is a jaw actuating sleeve 45 extending between the knob sleeve 35 and the jaws 27. Upon the upper end of the jaw actuating sleeve 45 is mounted a knob sleeve or handle 46 of insulating material having an internal bore 47, near the end of which are embedded ears 48, leaving cut-outs 49 therein, these ears 48 and cut-outs 49 aiding the anchorage of jaw actuating sleeve 45 in the knob sleeve 46 within the manipulating knob 50 formed thereon.

In order to keep the jaws normally closed, a coil spring 51 is provided, located in an internal bore 52 of the knob sleeve 35 and extending into the bore 47 of the knob sleeve 46 and bearing against internal shoulder 53 of the bore 52 and internal shoulder 54 of the bore 47.

In operation, telescoping the knob handle 40 down over the knob sleeve 50 against the pressure of coil spring 51 permits the jaws 27 to move from the closed position shown in Fig. 1 to the open position shown in Fig. 2. While in this position if it is desired to stow away the screw driver or place it in position for operation as an ordinary screw driver, the handle 1 may be moved downwardly, thereby causing the teeth 29 of jaws 27 to move upwardly to the position of the circumferential slots or grooves 22, whereupon they may be allowed to be placed in the position shown in Fig. 3 by releasing the knob handle 40 and allowing the coil spring 51 to extend it upwardly, thus causing teeth 29 of the spring jaws 27 to enter the circumferential slots 22. By obvious manipulation of the respective handle 1 or the knob handles 40 and 50, the spring jaws 27 may be caused to grip about the head of a screw, as shown in Fig. 1, or to release the same when desired. If a different sized screw is being used the holding means in the handle 1 may be manipulated to permit the driver bar 3 to be re-

moved therefrom and reversed. Obviously, when so removed the retriever may be used as an independent tool, controllable for suitable manipulation of the knob handles 40 and 50.

As an independent tool or as a combination tool, this invention is especially useful for the manipulation of screws, especially in places where it is difficult to insert a hand or the fingers, such as in gun fire control and radio apparatus.

Other modifications and changes in the proportions and arrangements of the parts may be made by those skilled in the art without departing from the nature of the invention, within the scope of what is hereinafter claimed.

The invention described herein may be manufactured and/or used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

In a combination screw driver and retriever tool, a retriever comprising a pair of concentric telescopic sleeves, the inner sleeve being hollow to permit a screw driver bar to extend there-through, a pair of yieldable retriever jaws comprising stems integral with said inner sleeve, the forward portions of said stems forming cam ends extending forwardly and outwardly and terminating in inwardly extending gripping elements, said cam ends cooperating with the outer sleeve to actuate said elements, the greatest distance between said cam ends, when the retriever is in operative position, being greater than the outer diameter of the outer sleeve, the width of said jaws being less than the diameter of said outer sleeve, a telescopic handle means secured to the other ends of each of said sleeves for manipulating the outer sleeve over the inner sleeve to cause said retriever jaws to approach each other, said telescopic handle means comprising a handle secured to the outer sleeve, said inner sleeve extending beyond said outer sleeve, a handle secured to said inner sleeve and a bored skirt extending from said inner sleeve handle and telescopic over said outer sleeve handle, said outer sleeve handle including a bored skirt extending telescopically within said inner sleeve handle skirt, a compression spring based within said skirt bores normally urging said sleeves in a direction to retract said jaws to a gripping position, a screw driver comprising a driver bar extendable through said concentric sleeves, a driver blade at the end of said driver bar, said driver bar having a circumferential slot adjacent to said driver blade for cooperating with said jaws in gripping position, a handle to which said driver bar is secured and a bored skirt extending from said handle, said last mentioned skirt being telescopic over said inner sleeve handle, said three handles providing an easily manipulatable unitary handle whereby said driver bar may be manipulated with relation to said retriever jaws, said driver bar and blade being slidably removable from said telescopic sleeves to detach said retriever as a unit, said jaws when in gripping position on said circumferential slot preventing accidental separation of said retriever and said screw driver.

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