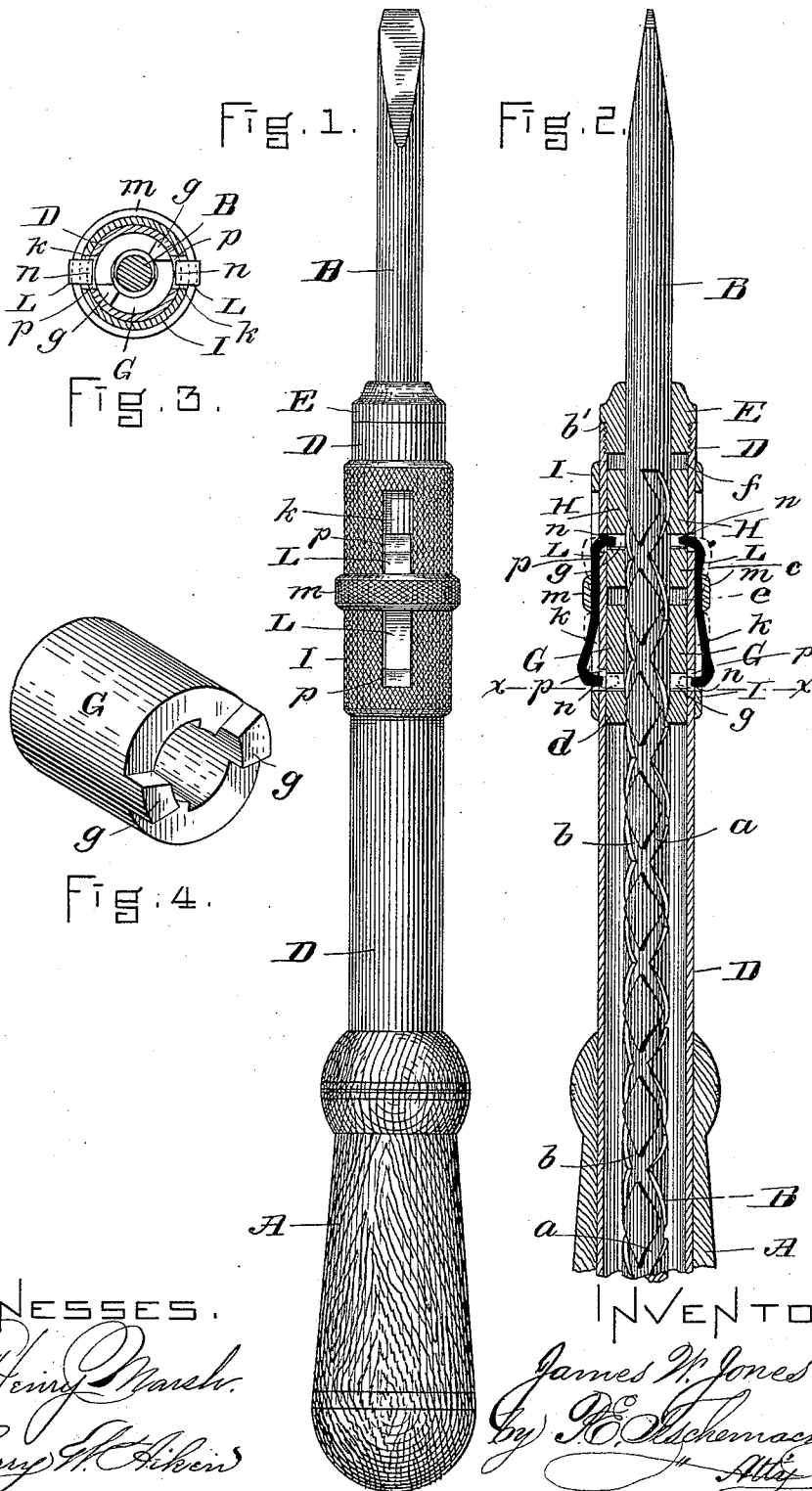


(No Model.)

J. W. JONES.
SCREW DRIVER.

No. 470,055.

Patented Mar. 1, 1892.



WITNESSES.
J. H. Marsh.
Harry M. Finken

INVENTOR.
James W. Jones
By J. C. Buchmacher
Att'y

UNITED STATES PATENT OFFICE.

JAMES W. JONES, OF BELFAST, MAINE, ASSIGNOR OF ONE-HALF TO FRANK A. HOWARD, OF SAME PLACE.

SCREW-DRIVER.

SPECIFICATION forming part of Letters Patent No. 470,055, dated March 1, 1892.

Application filed May 16, 1891. Serial No. 393,011. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. JONES, a citizen of the United States, residing at Belfast, in the county of Waldo and State of Maine, have invented certain Improvements in Screw-Drivers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side view of a screw-driver constructed in accordance with my invention. Fig. 2 is a longitudinal central section of the same. Fig. 3 is a section on the line *xx* of Fig. 2. Fig. 4 is an enlarged view of one of the rotary nuts by which the spindle or bit is revolved when pressed into the handle.

My invention relates to that class of screw-drivers having a spirally-grooved spindle or bit adapted to be rotated when pressed into the handle by means of a horizontally-sliding rotary nut, which when said spindle is to be revolved is caused to engage with a clutch or stop by which it is locked and held stationary, said nut being disengaged from the clutch and permitted to rotate within its chamber while the spindle is being drawn out or extended for the next operation. To provide a simple and reliable screw-driver of this description in which the direction of motion of the spirally-grooved spindle or bit can be easily reversed to enable it to either drive or back out a screw is the object of my invention, which consists in a screw-driver provided with a tubular socket secured to a tool-handle and having two separate and independent chambers and a spindle or bit having right and left hand intersecting spiral grooves, in combination with two rotary longitudinally-sliding nuts adapted to fit the right and left hand grooves of the spindle and placed within the two chambers of the socket, and a double catch having projections at its opposite ends adapted to enter said chambers and engage with one or the other of said nuts to lock the same, as hereinafter more particularly set forth.

In the said drawings, A represents the handle of the screw-driver, which is formed hollow nearly its entire length to receive the spindle B, which is provided with right and

left hand spiral grooves *a b*, intersecting each other, as shown, the outer end of said spindle B being made wedge-shaped to form the screw-driving bit.

D is a tubular metallic socket or sleeve, which is immovably secured to the handle A to prevent it from turning therein when the screw-driver is in use. The outer end of the socket D is screw-threaded in its interior to receive a correspondingly-threaded cap E, having a shoulder *b'*, which rests upon the end of the socket, making a flush-joint, said cap having a central aperture through which the spirally-grooved spindle B is free to slide. Within the socket D are immovably secured, by driving them into place or in any other suitable manner, two collars or bushing *c d*, through which the spindle is free to slide and by means of which and the cap E it is supported axially within the tubular socket. The bushings *c d* divide the front portion of the socket D into two separate and independent chambers *e f*, within which are placed two rotary nuts G H, which are free to slide a short distance longitudinally within said chambers, said nuts being each provided at the rear end with angular teeth or projections *g g*, as seen in Figs. 3 and 4, which are adapted to engage with a stop or clutch, to be hereinafter described, whereby the spindle or bit is rotated in either direction to turn or drive a screw or back it out, as may be desired. The right-hand or inner nut G, which fits the right-hand spiral groove *a* of the spindle, is placed within the inner chamber *e* and is free to slide therein between the bushings *c d*, the latter limiting the inward movement of the nut, while the left-hand or outer nut H, which fits the left-hand spiral groove *b* of the spindle, is free to slide in the outer chamber *f* between the bushing *c* and the cap E, which limits its movement in that direction. To the inner end of the spindle B is secured a stop-washer, (not shown,) which is adapted to come into contact with the inner bushing *d*, and thus prevent the spindle from being pulled out of the socket D. Upon the outside of the socket D is fitted a tubular slide I, having two longitudinal slots *k k* diametrically opposite each other, and encircling the slide I at its center is a ring *m*,

riveted securely thereto, so as move therewith
 as it is pushed up or down upon the socket D
 by the hand. Within each of the slots *k k* is
 fitted a rocker lever or catch *L*, the under con-
 5 vex side of which rests upon the socket D, as
 seen in Fig. 2. At each end of this rocker is
 a tongue or projection *n*, which is adapted to
 pass through an aperture *p* into the nut-cham-
 10 ber immediately thereunder when that end of
 the catch is rocked inward by moving the
 slide I and ring *m* up or down, the outer sur-
 face of the catch being convex in the direc-
 tion of its length, so that a movement of the
 15 ring *m* in either direction will force one of the
 projections *k* of each catch into one chamber
 of the socket D and simultaneously withdraw
 the projection *k* at the opposite end of each
 catch from the other chamber of the said
 20 socket D. The projections *n*, when within
 one or the other of the chambers *e f*, form
 stops or clutches, with which engage the an-
 gular teeth *g g* of the rotary nut in said cham-
 ber, when said nut is slid backward by the
 25 action of the spindle as the latter commences
 to be forced inward after having been ex-
 tended and its outer end inserted into the nick
 of the screw to be driven. The length of each
 chamber *e f* is equal to the length of the nut,
 30 including its projections or teeth *g*, plus the
 length of the tongue or projection *n* of the
 rocking catch, so that whichever nut is locked
 stationary it may have sufficient space to re-
 ceede out of engagement with the clutch when
 the spindle is drawn outward and again ad-
 35 vance to engage the clutch when the spindle
 first commences to be forced inward for the
 purpose of rotating it in the same manner as
 in the single-acting screw-driver of this de-
 scription as heretofore constructed.
 40 In operating the above-described screw-
 driver when it is desired to drive a screw the
 slide I is moved toward the outer end of the
 socket D into the position seen in Fig. 2,
 which causes the projection *n* at the outer
 45 end of each of the rockers *L* to be projected
 through its aperture *p* into the outer cham-
 ber *f*, thus forming a clutch for the outer or
 left-hand nut H, which, when the spindle, af-
 ter being extended, is forced inward by pres-
 50 sure upon the handle, engages said clutch,
 thus causing the spindle to be rotated in the
 desired direction to turn in or drive a screw.
 This movement of the rocker *L* simultane-
 ously withdraws the projections *n* at the in-
 55 ner ends of the rocker *L* from the inner cham-
 ber *e*, thus releasing the right-hand nut G and
 permitting it to rotate freely around the spin-
 dle while the latter is being rotated by the
 60 other nut H to drive the screw. When it is
 desired to withdraw or back out a screw, the

slide I is moved inward toward the handle A,
 when the projections *n* at the inner ends of
 the rockers will be forced into the inner cham-
 ber *e* and the opposite projections *n* with-
 65 drawn from the chamber *f*. This releases the
 nut H and causes the right-hand nut G to be
 brought into use, when an inward pressure upon
 the extended spindle will cause it to be rotated
 in the proper direction to withdraw or back
 70 out a screw, and in this manner either nut
 can be readily brought into use, as desired.
 When the parts are adjusted for the spindle
 to back out a screw, it may be used as an or-
 dinary screw-driver to turn a screw in, and
 when the parts are adjusted for the spindle
 75 to drive or turn a screw in it can be used as
 an ordinary screw-driver to back a screw out,
 thus rendering the tool very convenient un-
 der all circumstances.

What I claim as my invention, and desire 80
 to secure by Letters Patent, is—

1. In a reversible screw-driver, a tubular
 socket secured to a tool-handle and having
 two separate and independent chambers and
 a spindle or bit having right and left hand 85
 intersecting spiral grooves, in combination
 with two rotary longitudinally-sliding nuts
 adapted to fit the right and left hand grooves,
 respectively, of the spindle and placed within
 the two chambers of the socket, and a double 90
 catch having projections at its opposite ends
 adapted to enter said chambers and engage
 one or the other of said nuts to lock the same,
 whereby the spindle is rotated in either di-
 95 rection as it is forced backward into the han-
 dle, substantially as set forth.

2. In a reversible screw-driver, the tubular
 socket D, secured to the tool-handle and hav-
 ing two separate chambers *e f*, the screw-cap
 E, and the collars or bushings *c d*, combined 100
 with the spindle B, provided with intersect-
 ing right and left hand spiral grooves, the
 right and left hand rotary longitudinally-slid-
 ing nuts G H, placed within the chambers *e*
 105 *f* and having the angular teeth or projections
g g, the rocking levers or catches *L L*, having
 tongues or projections at their opposite ends
 adapted to pass through apertures into the
 nut-chambers *e f*, and the slide I, with its ring
 110 *m*, adapted to actuate the rocking catches *L*
L, whereby either nut G or H may be locked
 or brought into use to rotate the spindle, sub-
 stantially as set forth.

Witness my hand this 9th day of May, A.
 D. 1891.

JAMES W. JONES.

In presence of—

R. P. DUNTON,
F. A. HOWARD.