

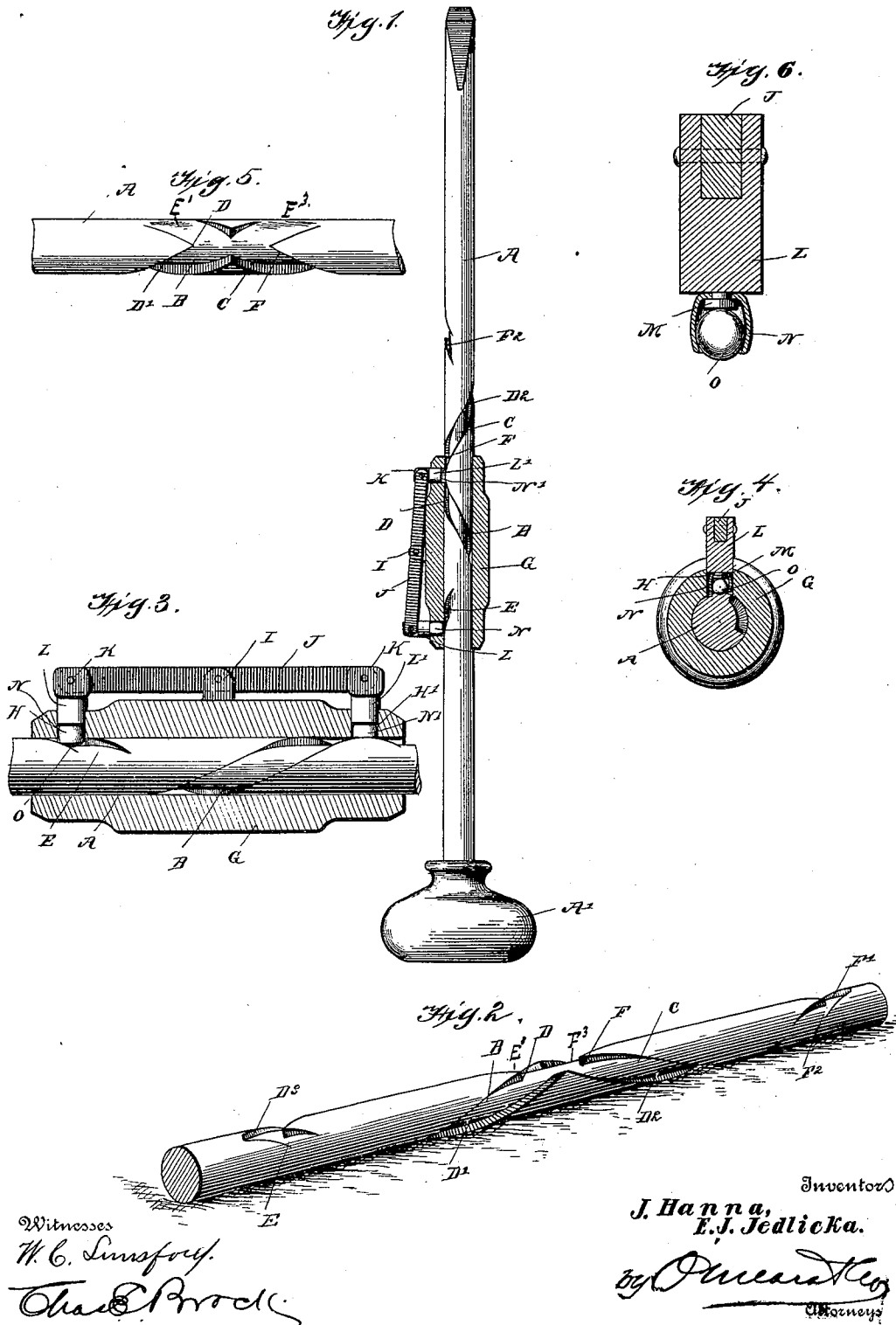
No. 654,150.

Patented July 24, 1900.

J. HANNA & E. J. JEDLICKA.  
TOOL HANDLE.

(Application filed Sept. 18, 1899.)

(No Model.)



# UNITED STATES PATENT OFFICE.

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## TOOL-HANDLE.

SPECIFICATION forming part of Letters Patent No. 654,150, dated July 24, 1900.

Application filed September 18, 1899. Serial No. 730,878. (No model.)

*To all whom it may concern:*

Be it known that we, JOSEPH HANNA and EDWARD J. JEDLICKA, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Tool-Handles, of which the following is a specification.

This invention relates to that class of rotatable tools, such as screw-drivers or drills, which are provided with spirally-grooved spindles or bits adapted to be rotated by the longitudinal movement thereon of a hand-grip; and the object of the invention is to provide a simple, reliable, and economically-constructed tool of this class in which the spindle may be continuously rotated in one direction by complete reciprocation of the hand-grip thereon or reversed in direction of rotation by the upward and downward movement of the hand-grip when the reciprocations are not complete from end to end of the grooves.

In the drawings forming part of this specification, Figure 1 is a view, partly in elevation and partly in section, illustrating the invention as applied to a screw-driver. Fig. 2 is a perspective view of the grooved portion of the bit or spindle detached. Fig. 3 is an enlarged sectional view of the hand-grip and part of the spindle therein. Fig. 4 is a transverse sectional view on the plane indicated by the broken line 4 4 of Fig. 3. Fig. 5 is a detail view, in side elevation, of part of the spindle, specially illustrating the crossing-point and vanishing inner ends of the grooves. Fig. 6 is a transverse sectional view, on an enlarged scale, through one of the clutch-lever rollers and balls on the same plane as Fig. 4.

Like letters of reference indicate the same parts wherever they appear in the several figures of the drawings.

Referring to the drawings by letters, A indicates a spindle upon which is swiveled a head or handle A', the spindle being illustrated in this instance as that of a screw-driver having the usual flat working end, although the invention is equally applicable to the bits of all tools—such as drills, &c.—which require to be rotated. In the surface of the spindle are cut or otherwise formed two reversely-arranged spiral grooves B and C, which are joined at their adjacent ends. Each end of each spiral

or groove is formed with a short reversely-arranged groove E and E' at the ends of the groove B, and F<sup>2</sup> and F<sup>3</sup> at the ends of the groove C. Each of these shorter grooves, as also a portion of the main groove adjacent thereto, tapers or inclines toward the surface until each end groove finally disappears on the surface. Each of the spiral grooves makes a complete circuit of the spindle, which will cause all of the ends of the grooves to occupy the same axial line upon the surface of the spindle, and they are of the same depth at that point, and the short tapering ends of each groove will extend in opposite directions from opposite sides of said line. The intermediate portions of the main grooves are slightly deeper than the ends, as indicated at D' and D<sup>2</sup>, respectively.

Mounted upon the spindle so as to be moved freely from end to end is a sleeve or nut G, the ends of which are provided with parallel perforations H and H', which are located at a distance apart equal to the pitch of the grooves A and B. Projecting through these perforations are two pins L and L', the inner ends of which are adapted to extend into the grooves and rotate the spindle as the sleeve is reciprocated. The outer ends of the pins are pivotally secured to the ends of a lever J, which is pivotally mounted in a bifurcated stud or lug I, projecting from the sleeve G. The inner ends of the pins are preferably provided with roller-bearings N and N' and the balls O and O', respectively, as shown more clearly in Fig. 6. The rollers will engage with the walls of the grooves and the balls with the inclined or tapering portions of the bottoms and avoid undue friction. The length of the pins is such that when one pin is in engagement with the surface of the spindle the other one will be forced into its respective groove, and when the ends of the grooves are reached the outward movement of one pin will cause the inward movement of the other one until at the extreme end of the reciprocation in either direction the inward projection of the pins will be the same. At the beginning of the reverse reciprocating movement of the sleeve the spindle will be rotated in one direction or the other, according as to whether the pins enter the main grooves or the tapering ends.

In the operation of the invention the sleeve should be first moved to one end of its stroke—as, for instance, to the upper or head end, as illustrated in Figs. 1 and 3. It is now ready to be moved down upon the spindle to turn the spindle in either direction. In turning the spindle to the right the pin L will leave point D<sup>3</sup> and traversing the groove B to point D will have caused the spindle to make one turn to the right when the pin reaches D. The pin L' will now have reached the point F', which is the end of its stroke. The sleeve is now moved in the opposite direction. The pin L entering the groove C and following it will hold the pin L out of the groove B until the point F is reached by pin L' and point D<sup>3</sup> by pin L, being the end of the return stroke. The next movement of the sleeve will be a repetition of the first and will continue the rotation of the spindle to the right. Starting from the same point the spindle may be continuously rotated to the left by the same movement of the sleeve by simply starting the pin L out of groove A, and consequently pin L' into groove B. All of the movements and results will then be exactly the reverse of those before described, and the spindle will be continuously rotated to the left.

It will be observed that the groove B, as a complete groove, ends at D, where groove C begins, so that each complete groove is independent and extends exactly one circuit around the spindle, those parts of the grooves beyond points D' and D<sup>3</sup> in either direction and the reversed parts at the ends merely serving as switches or cam-surfaces to force the pins out of the grooves, as before described.

The direction in which the spindle is to be rotated is determined by the pins L and L', which are caused to enter the desired groove by slightly rotating the sleeve axially upon the spindle, the spindle being prevented from rotating therewith by its engagement with the work. For instance, if it is desired to rotate the spindle to the right the sleeve is slightly rotated to the left and forced toward the tool being operated, which will cause the pin L to

enter groove B; but if it is desired to rotate the spindle to the left the sleeve is slightly rotated to the right, which will cause the pin L' to enter the groove C, as shown in the drawings. If a continuous rotation is desired, the sleeve is slightly rotated in the original direction at the beginning of the return stroke to cause the pins to enter their proper grooves. The simplicity, cheapness of construction, and durability of the device will be obvious from the foregoing. The sleeve G and the lever may be inclosed in a hollow hand-grip, if desired, to protect the lever from injury in use and to afford a smoother grip for the user.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a rotatable tool, the combination with a spindle provided with two reversely-arranged spiral grooves, each end of each of which is formed with a short reversely-arranged groove, the short grooves and the portions of the main grooves adjacent thereto being each provided with an inclined bottom, said spiral grooves being united at their adjacent ends and each making a complete circle of the spindle, of a swiveled head at one end of the spindle and a tool at the other, a reciprocatory sleeve on the spindle, each end of which is provided with an inwardly-projecting pin, and means for reversely moving said pins in unison into or out of said grooves.

2. In a rotatable tool, the combination with a spirally-grooved spindle, of a swiveled head at one end and a tool at the other, a reciprocatory sleeve thereon, each end of which is perforated radially to its bore, a pin in each perforation, the inner end of which is provided with a roller and a ball, and a lever pivotally mounted on the sleeve and having its ends connected with said pins.

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Witnesses:

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