

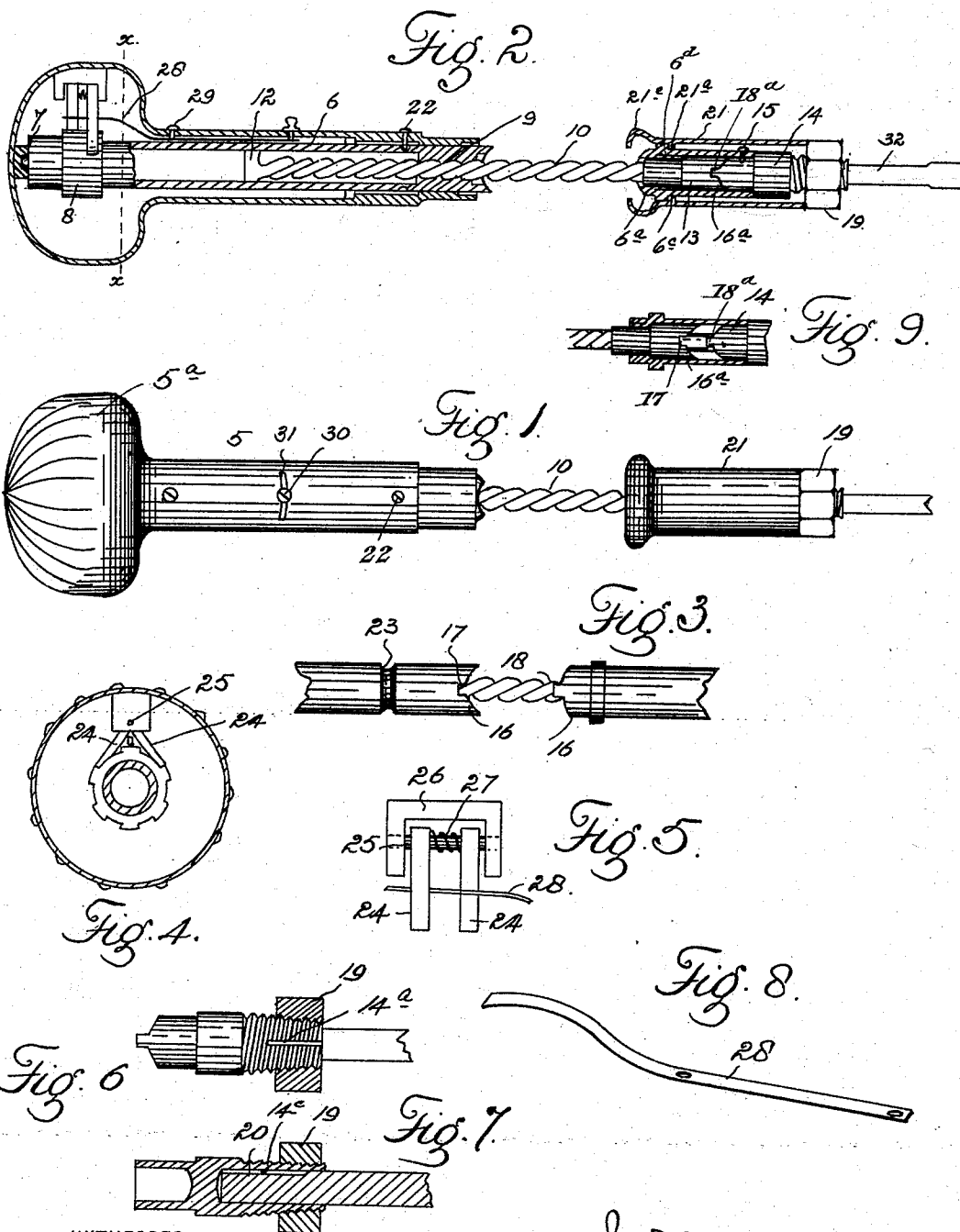
(No Model.)

J. B. HUGHES.

COMBINATION SCREW DRIVER AND TOOL HANDLE.

No. 505,165.

Patented Sept. 19, 1893.



WITNESSES:

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COMBINATION SCREW-DRIVER AND TOOL-HANDLE.

SPECIFICATION forming part of Letters Patent No. 505,165, dated September 19, 1893.

Application filed August 22, 1891. Serial No. 403,490. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. HUGHES, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in a Combination Screw-Driver and Tool-Handle; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in screw-drivers wherein is combined the features of a ratchet, spiral and ordinary tool of this class, and the object of the invention is to provide a device of the class stated which shall be comparatively simple in construction, economical in cost, easily operated, and quickly adjusted, as well as reliable, durable and efficient in use.

To these ends the invention consists of the features, arrangements and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings in which is illustrated an embodiment thereof.

In this drawings, Figure 1 is an elevation of the tool showing the spiral rod partly withdrawn from the tubular handle. Fig. 2 is a longitudinal section of the same. Fig. 3 is a fragmentary view of the divided inner tube. Fig. 4 is a transverse section taken through the enlarged extremity of the handle on the line $x-x$, Fig. 2. Fig. 5 is an enlarged view in detail of the dogs or pawls engaging the ratchet formed on the inner tube and located within the enlarged extremity of the handle. Fig. 6 is an enlarged elevation of the bit chuck, the fastening nut being shown in section. Fig. 7 is a section taken through the chuck showing the bit in position. Fig. 8 is a perspective view of the lever employed in adjusting the ratchet pawls or dogs. Fig. 9 shows the disengaged positions of the plunger and chuck.

Similar reference characters indicating corresponding parts or elements of the mechanism in the several views let the numeral 5

designate the hollow handle provided with the enlarged extremity 5^a. Within this handle is located the tube 6 pivoted within the enlarged extremity of the handle as shown at 7 and carrying the ratchet pinion 8 near its pivoted extremity and fashioned interiorly near its opposite extremity as shown at 9 to fit the spiral stem or rod 10 whereby as the inner tube is moved back and forth upon said rod a rotating movement is imparted thereto. One extremity 12 of the spiral stem is fashioned to slide freely within the tube while its opposite extremity is secured to a short plunger 13 located within section 6^a of the inner tube which is secured to the chuck 14 by a pin or screw 15. The plunger and chuck, as well as sections 6 and 6^a of the inner tube are oppositely curved as shown at 16 and 16^a, the one part being recessed as shown at 17 to receive a projection 18 18^a formed upon the adjacent extremity of the other part. It will thus be seen that if the projections 18 or 18^a engage the curved surface 16 or 16^a, the projection will slip automatically into its corresponding socket under the influence of an axially forward pressure, thus locking the parts together for use as an ordinary or ratchet tool. The bit receiving extremity of the chuck is threaded to receive the nut 19 and slotted as shown at 14^a to permit the necessary expansion and contraction in tightening and loosening the bit. The tube section 6^a is surrounded by a shell 21 in which the inclosed tube section rotates when the tool is in operation. Shell 21 is held in position by the nut 19 and a shoulder 6^b formed upon the tube, which shoulder is engaged by a corresponding interior rib 21^a formed upon the shell which also provided with an enlarged extremity 21^b to protect the hand from injury when the tube 6 is forced down to engagement with section 6^a during the use of the tool. The handle 5 and the tube 6 are locked from longitudinal movement upon each other by a pin or screw 22 which passes through the shell of the handle and enters a circumferential recess or groove 23 formed in the tube 6, permitting a rotary movement of the parts, the one within the other, but locking them together longitudinally. The ratchet pinion is engaged by two pawls or dogs 24, one engaging the pinion on each side and normally

locking the tube 6 against rotating within the handle 5. The pawls are pivoted upon a pin 25 supported by a hanger 26 secured to the inner surface of the enlarged extremity of the handle. The pawls are normally held in engagement with the pinion by a coil spring 27 surrounding the pin 25 and having its extremities respectively attached to the pawls.

In making a ratchet tool of the device one of the pawls must be disengaged from the pinion. This is accomplished by a small lever 28 located in the handle 5, fulcrumed at 29 and operated by a stud 30 protruding through a slot 31 formed in the handle. The free extremity of this lever occupies a position between the pawls. When the stud is moved to one extremity of the slot one pawl is disengaged from the pinion; when the stud is moved to the opposite extremity of the slot, the opposite pawl is disengaged from the pinion; in either case the device becomes a ratchet tool. If the stud occupies a position in the center of the slot as shown in Fig. 1, both pawls engage the pinion and the device becomes an ordinary tool.

Any bit which operates by rotation may be placed within the chuck. The construction is, however, specially designed for use as a screw driver, a suitable bit 32 being shown in Fig. 2. In the use of the tool in this relation the spiral rod is first withdrawn from the tube 6 and one of the pawls disengaged from the ratchet pinion by a suitable adjustment of the lever 28. The bit is then inserted in the screw head and the handle thrust forward axially upon the spiral stem, causing the same to rotate by virtue of the constructions heretofore explained. This may be repeated until the screw offers considerable resistance. In this case the handle being moved to its limit on the stem and tubes 6 and 6^a locked together, as heretofore explained, the device is used as a ratchet screw driver; or the lever may be so adjusted that the tool becomes an ordinary screw driver as described. It will be observed that the plunger 13 must have sufficient movement within tube 6^a to permit of its being disengaged from the chuck when it is desired to draw the handle and the inner tube backward upon the spiral stem without removing the bit from the screw head. This is accomplished by leaving a space 6^d between a shoulder on the plunger and a corresponding engaging shoulder formed in tube 6^a. The disengaged position of the plunger and chuck is illustrated in Fig. 9.

The bit 32 is provided with a longitudinal

groove 20 adapted to be engaged by a short projection 14^c with which the chuck is provided. This feature locks the bit from rotation within the chuck. The plunger 13 is practically an integral part of the chuck 14 at all times except during the reverse movement of the handle when used as a spiral tool, in which case as the handle is drawn backward the part 13 first moves away from the chuck 14, thus permitting the spiral rod to rotate freely in the reverse direction while the bit is stationary engaging the nick in the screw head.

Having thus described my invention, what I claim is—

1. The combination of the hollow handle, the spiral stem adapted to rotate within the handle which is fashioned to impart motion thereto as the handle is reciprocated thereon, one extremity of the spiral stem carrying a clutch member, the bit chuck having the counter-part clutch member, and the outer shell rotatably connected with the chuck and adapted to protect the hand of the user as the handle is thrust forward on the stem, substantially as described.

2. The combination of the hollow handle, the spiral stem, the inner tube rotatably connected with the handle and fashioned to rotate the stem when moved axially thereon, said tube being provided with a ratchet pinion, a pin supported within the hollow handle and carrying a coil spring, two pawls pivoted on this pin and attached to opposite extremities of the spring whereby the free extremities of the pawls are normally held in engagement with the pinion, and a lever fulcrumed on the handle and extending lengthwise of the tool, one extremity thereof occupying a position between the pawls whereby the movement of the opposite extremity in either direction disengages one of the pawls from the pinion, substantially as described.

3. The combination of the hollow handle, the divided inner tube, the spiral stem carrying the plunger at one extremity, the chuck having one section of the inner tube located thereon and the outer shell rotatably connected with the chuck and tube section and adapted to protect the hand as the tube sections engage during use, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN B. HUGHES.

Witnesses:

JOHN T. ROBERTS,
WILLIS F. WOLFF.