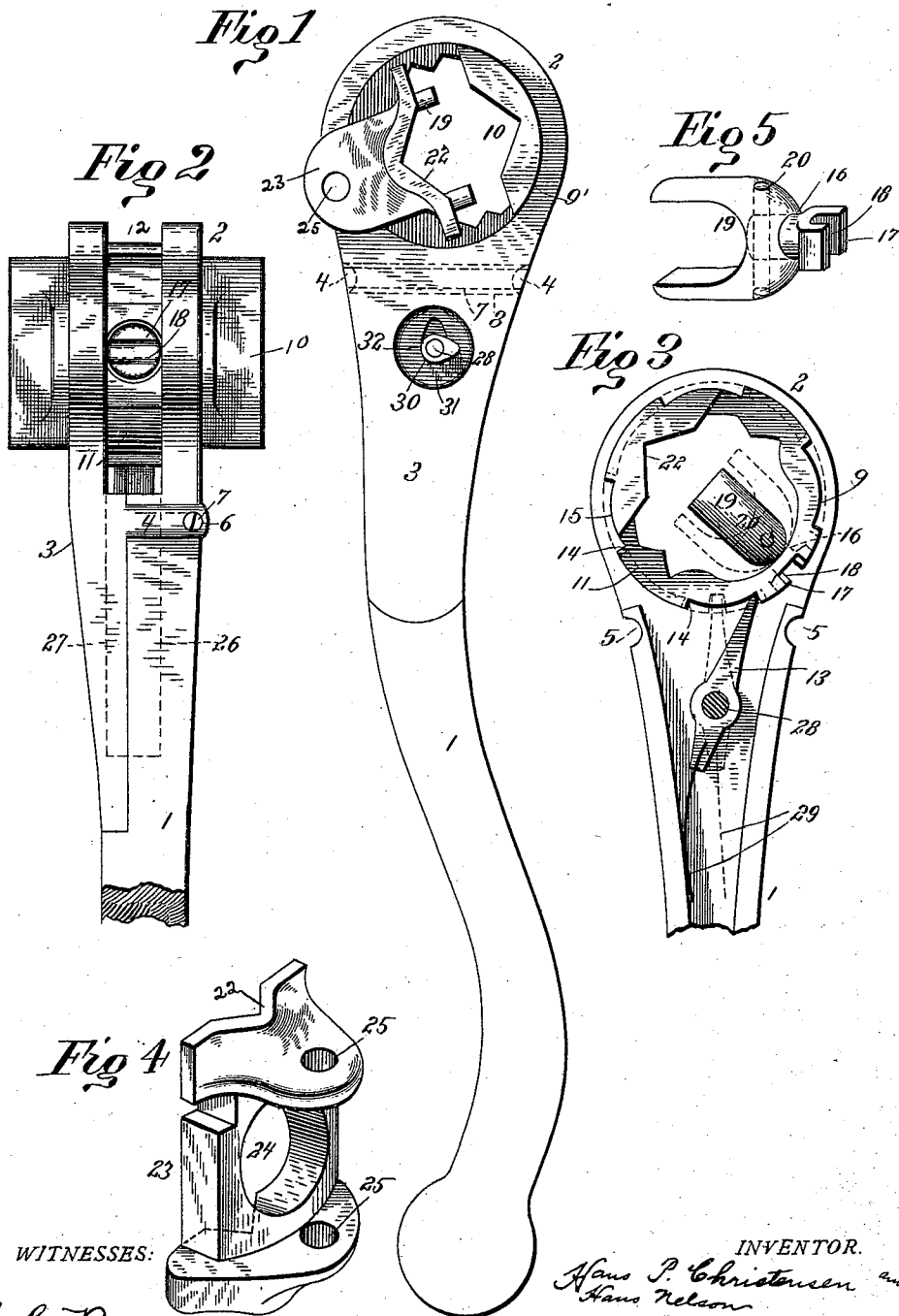


(No Model.)

H. P. CHRISTENSEN & H. NELSON.
WRENCH.

No. 478,405.

Patented July 5, 1892.



WITNESSES:

C. C. Burdine &
H. Hume Clendenin

INVENTOR.

Hans P. Christensen and
Hans Nelson

BY

W. D. Dwyer

ATTORNEYS.

UNITED STATES PATENT OFFICE.

HANS P. CHRISTENSEN AND HANS NELSON, OF MARINETTE, WISCONSIN.

WRENCH.

SPECIFICATION forming part of Letters Patent No. 478,405, dated July 5, 1892.

Application filed January 15, 1892. Serial No. 418,176. (No model.)

To all whom it may concern:

Be it known that we, HANS P. CHRISTENSEN and HANS NELSON, citizens of the United States, residing at Marinette, in the county of Marinette and State of Wisconsin, have invented certain new and useful Improvements in Wrenches; and we 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 figures of reference marked thereon, which form a part of this specification.

Our invention relates to that class of ratchet-wrenches in which the nut to which it is applied can be turned to right or left; and our object is to provide a more convenient and desirable device than those heretofore used.

To this end our invention consists in the peculiar features and combinations of parts more fully described hereinafter, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a top view of my complete device; Fig. 2, a side elevation; Fig. 3, a top view with the cap removed to show the ratchet mechanism; Figs. 4 and 5, views of details.

The reference-numeral 1 represents the curved handle portion of our wrench, 2 the head portion, and 3 a removable cap. The latter is fastened to the head portion by means of a pair of transverse arms 4, cast integral with the cap and fitting within grooves 5, so as to lie flush with the outer surface. The ends of these arms are provided with holes 6, which receive a locking-pin 7, lying in a groove 8 in the head-section. Both the head portion 2 and cap 3 are enlarged and provided with registering circular orifices 9 and 9', which receive a revoluble nut-socket 10. This socket is preferably cast in one integral piece, and an annular series of raised ratchet-teeth 11 are formed on its periphery. A space 12 is left between the head 2 and cap 3 to receive these ratchet-teeth, which are of a peculiar shape. They have an oblong curved outer surface, over which the nose of a spring-pawl 13 slides. The opposite ends 14 of each tooth are cut inwardly to form a recessed end for the reception of the pawl in the operation of

revolving the socket, and between the adjacent ends of each tooth is a raised portion 15, which receives the end of the pawl to assist it over the succeeding ratchet-tooth. In the center of one of the ratchet-teeth is made a hole, which receives a radial turn-pin 16, having a head 17, provided with a transverse open slot 18. This pin is held in place by a U-shaped locking-piece 19, the prongs of which project inward, and a transverse pin 20 locks the locking-piece to the pin. The prongs are provided for the purpose of easily turning the pin from the inside of the revoluble socket 10. The opposite ends of the socket project beyond the outer faces of the head portion of the wrench and have angular recesses 22 to receive a nut or bolt. A removable jaw 23 is placed within the interior of the nut-socket 10 and is provided with a central orifice 24, through which the locking-piece and pin pass. This removable jaw is provided with a pair of openings 25, registering with the head of the pin 20, so that the latter can be removed when desired. The head portion 2 is provided with a recess 26, registering with a similar recess 27 in the cap 3, the two forming a chamber, within which the pawl 13 operates. This pawl is pivoted on a stud 28, and in the tail of the pawl is fastened a flat spring 29, adapted to press on either wall of the chamber, the pawl being pivoted midway between the two walls, so that the spring will be just as effective, no matter which way the pawl is pointed. The cap 3 is made still more secure by a turn-button 30, movable within a depression 31 and adapted to pass through a slot 32 in taking the cap off or putting it on.

A description of the preferred construction of our device having been set forth, we will now proceed to briefly describe its operation. Either side or end of the nut-socket being applied to a nut and the handle worked back and forth, the pawl will engage the ratchet and revolve the socket in one continuous direction, and by simply turning the wrench over and applying the opposite end of the socket the nut will be rotated in the opposite direction. When the slot of the turn-pin is turned across the path of the pawl, the latter will slide over the head and not reverse itself. If it should be desired to change the direc-

tion of rotation without turning the wrench over, it can be done by giving the turn-pin a quarter-turn, so that the slot in the head will lie parallel with the axis of the socket and
5 let the nose of the pawl enter and reverse, in which act it is shown in dotted lines in Fig. 3.

The socket can be provided with various interior forms to apply to bars, bolts, or other articles to be rotated, and it is further appar-
10 ent that our invention could be varied in many slight ways that might suggest themselves to a skilled mechanic. Therefore, we do not limit ourselves to the exact construction herein shown, but consider ourselves en-
15 titled to all such variations as come within the spirit and scope of our invention.

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

20 1. In a ratchet-wrench, the combination of a head portion and removable cap, both provided with registering-openings, a revoluble nut-socket fitting in said openings, a turn-pin

provided with a slotted head, and a pawl adapted to enter said slot, substantially as de- 25 scribed.

2. In a wrench of the class described, the combination of a removable socket provided with exterior ratchet-teeth, a pawl, and slotted turn-pin, as specified. 30

3. The herein-described wrench, provided with a revoluble nut-socket having a ratchet and slotted turn-pin, in combination with a spring-actuated reversible pawl located in a chamber in the head portion of the wrench, 35 substantially as and for the purpose set forth.

4. In a ratchet-wrench, a nut-socket having teeth and a turn-pin, in combination with a reversing-pawl, substantially as described.

In testimony whereof we affix our signatures 40 in presence of two witnesses.

HANS P. CHRISTENSEN.

HANS NELSON.

Witnesses:

NELS CHRISTENSEN,

GEORGE HEMMINGSEN.