

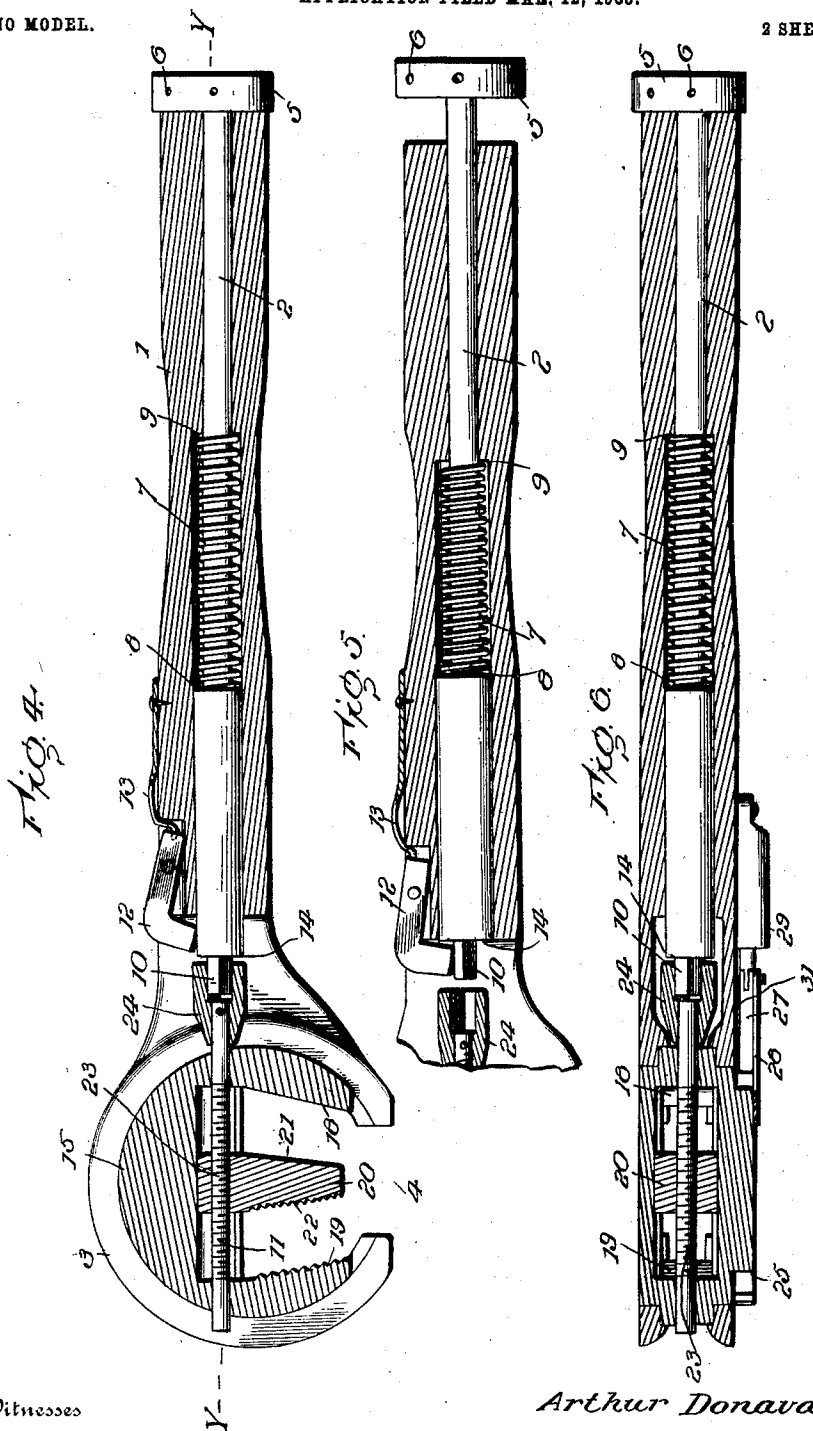
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PATENTED JUNE 30, 1903.

A. DONAVAN.
RATCHET WRENCH.
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NO MODEL.

2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

ARTHUR DONAVAN, OF MASON CITY, ILLINOIS.

RATCHET-WRENCH.

SPECIFICATION forming part of Letters Patent No. 732,055, dated June 30, 1903

Application filed March 12, 1903. Serial No. 147,519. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR DONAVAN, a citizen of the United States, residing at Mason City, in the county of Mason and State of Illinois, have invented certain new and useful Improvements in Ratchet-Wrenches, of which the following is a specification.

This invention provides a tool or implement of the wrench type to enable parts to be forcibly rotated, such as nuts, pipes, or other bars.

An essential feature of the invention is the construction of the tool whereby the grip upon the object to be turned is not released, while at the same time the handle may be oscillated to turn the object intermittently, as by a ratchet movement.

A further purpose of the invention is the provision of novel means to admit of tightening or loosening the grip upon the object to be operated on by means connected with the handle of the tool, said means being readily detachable to admit of turning of the head in the operation of the tool.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a wrench embodying the invention. Fig. 2 is a section on the line X X of Fig. 1 looking to the rear, as indicated by the arrow. Fig. 3 is a perspective view of the rotary head. Fig. 4 is a central longitudinal section showing the operating-shaft in full lines. Fig. 5 is a view similar to Fig. 4, showing the operating-shaft disconnected from the screw-shaft of the rotary head. Fig. 6 is a section on the line Y Y of Fig. 4. Fig. 7 is a detail view of the head portion of the wrench, showing the rotary head turned so as to span the opening in the head of the handle and one of the pawls in engagement with the ratchet-teeth.

Corresponding and like parts are referred

to in the following description and indicated in all the views of the drawings by the same reference characters.

The tool comprises a handle 1, which is longitudinally bored to receive the operating-shaft 2 and is provided at one end with a head 3 of approximately circular form and composed of spaced parts, said head having an opening 4 in one side to admit of ingress and egress of the pipe, rod, or other work. The head 3 may be an integral part of the handle or may comprise separate parts secured thereto in any substantial manner to admit of the ready assembling of the parts or access being had thereto for repairs or other purpose.

The operating-shaft 2 is provided at its outer end with a button or wheel 5 to admit of force being applied thereto for turning shaft 2 in any direction. Openings 6 are provided in the periphery of button or wheel 5 to receive a rod or like instrument when great force is required to turn shaft 2 so as to firmly grip the work to be operated on. Shaft 2 is mounted in handle 1 both for rotary and sliding movement and is normally held pressed inward by means of a spring 7, mounted thereon and confined between a shoulder 8 of shaft 2 and shoulder 9 of handle 1, the opening through the handle being enlarged for reception of said spring. The inner end of shaft 2 is reduced and made angular, as shown at 10, so as to make interlocking connection with the screw-shaft 11, whereby shafts 2 and 11 may be turned either to the right or to the left as one part. The sliding movement of shaft 2 admits of its being coupled to or disconnected from shaft 11, and when uncoupled it is held against tension of spring 7 by means of catch 12, which is pivoted to one end of handle 1 and operated on by spring 13, so as to project it into engagement with shaft 2. In the economy of construction the catch 12 is disposed so as to engage over the shoulder 14, formed at the base of the reduced angular portion 10, as shown most clearly in Fig. 5.

The rotary head 15 is mounted in head 3, so as to turn in either direction, and is provided with an annular enlargement 16 to come between the spaced parts of head 3, so

as to hold rotary head 15 against lateral displacement. The rotary head 15 is recessed in one side or provided with an opening 17 to receive the work. The parts bordering upon
 5 recess 17 constitute fixed jaws, one of the jaws being plain, as shown at 18, and the other toothed, as shown at 19. When the rotary head 15 occupies a position so that opening 17 registers with opening 4, the work may
 10 be conveniently placed in position or withdrawn by relative lateral movement of the wrench, as will be readily comprehended. A movable jaw 20 is slidably mounted in the opening or recess 17 and is provided with two
 15 faces 21 and 22, the face 21 being plain to cooperate with jaw 18, and the face 22 being toothed for cooperation with jaw 19. The jaws 18 and 21 are adapted to grip angular or irregular work, whereas jaws 19 and 22
 20 are adapted to grip pipe, rods, or analogous round work, so as to prevent slipping. The jaw 20 is directed in its movements and held in place by suitable guides formed at the inner side of opening or recess 17, as shown
 25 most clearly in Fig. 2. A threaded opening 23 is formed through the inner end of jaw 20 and receives the screw-shaft 11, journaled at its ends in the head 15, preferably at the base of jaws 18 and 19, said screw-shaft serving as
 30 means for positively moving jaw 20 toward and from jaws 18 and 19. The screw-shaft 11 projects at its inner end and is constructed to admit of coupling and uncoupling shaft 2. As shown, a socket 24 is provided at the
 35 inner end of screw-shaft 11, and its opening is made angular to receive the angular end 10 of shaft 2 when parts 2 and 11 are coupled for simultaneous rotation.

A series of cogs 25 are provided in one side
 40 of head 15 and constitute ratchet-teeth for cooperation with pawls 26 and 27, pivoted to a side of head 3 and connected by rod 28 for simultaneous movement. A barrel 29 is pivoted at one end to a side of handle 1 and receives a spring-actuated stem 30, pivoted to
 45 pawl 27 at the elbow and at a distance from the pivotal connection 31 of said pawl with the tool-handle. The pawls 26 and 27 are double-ended, so as to be turned to admit of
 50 either arm or member being brought into operative position, according as the head 15 is to be turned either to the right or to the left when handle 1 is oscillated. The pawls 26 and 27 are spaced apart a distance greater
 55 than the distance between the outer ends of jaws 18 and 19, so that when head 15 occupies a position with recess 17 opposite one of the pawls the other pawl is in position to engage with the ratchet-teeth 25. At other
 60 times both pawls cooperate with the ratchet-teeth of head 15 to effect a turning thereof by a ratchet movement. The sole purpose of providing two sets of paws 26 and 27 is to enable head 15 to be turned at any position with
 65 reference to the handle.

When it is required to forcibly and posi-

tively grip a piece of work, head 15 is turned to bring shafts 2 and 11 into alinement, and same are coupled, and after the work has been introduced between the jaws shaft 2 is
 70 turned in the proper direction, which causes a corresponding movement of shaft 11 and longitudinal movement of jaw 20, whereby the object placed between the selected jaws is gripped. After the work has been thus
 75 gripped shaft 2 is moved outward to disengage it from shaft 11 and is held out of the path of shaft 11 by catch 12 engaging over shoulder 14 in the manner stated. By oscillating handle 1 in the usual manner the head
 80 15 is turned by a ratchet movement, the direction of rotation depending upon the position of pawls 26 and 27. After the work has been turned and the shafts 2 and 11 have been caused to aline said work is released by
 85 coupling shaft 2 to shaft 11 and rotating same in the opposite direction to move jaw 20 away from the cooperating jaw, as will be readily comprehended.

Having thus described the invention, what 90 is claimed as new is—

1. In a wrench, the combination of a handle, a rotary head journaled thereto and provided with an opening through an edge and with ratchet-teeth, and two sets of pawls ap-
 95 plied to the handle and spaced apart to admit of engagement of one at least with the ratchet-teeth of the rotary head at any position with reference to the handle, and means for causing simultaneous adjustment of said
 100 pawls, substantially as set forth.

2. In a wrench, the combination of a handle, a rotary head journaled thereto and provided with an opening through an edge and with ratchet-teeth, two sets of pawls applied
 105 to the handle and spaced apart to admit of engagement of one at least with the ratchet-teeth of the rotary head at any position with reference to the handle, means for connecting the pawls to effect simultaneous adjust-
 110 ment, and a coöperating spring for holding the pawls in an adjusted position, substantially as set forth.

3. In a wrench, the combination of a handle, a rotary head journaled thereto and provided with an opening through an edge and with ratchet-teeth, two sets of pawls applied
 115 to the handle and spaced apart to admit of engagement of one at least with the ratchet-teeth of the rotary head at any position with reference to the handle, means for connecting the pawls for simultaneous movement, and a spring-actuated stem pivotally connected with one of the pawls and having like connection with the handle, substantially as
 120 set forth.

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

ARTHUR DONAVAN. [L. S.]

Witnesses:

W. H. KEEFER,
 JUD DAVIS.