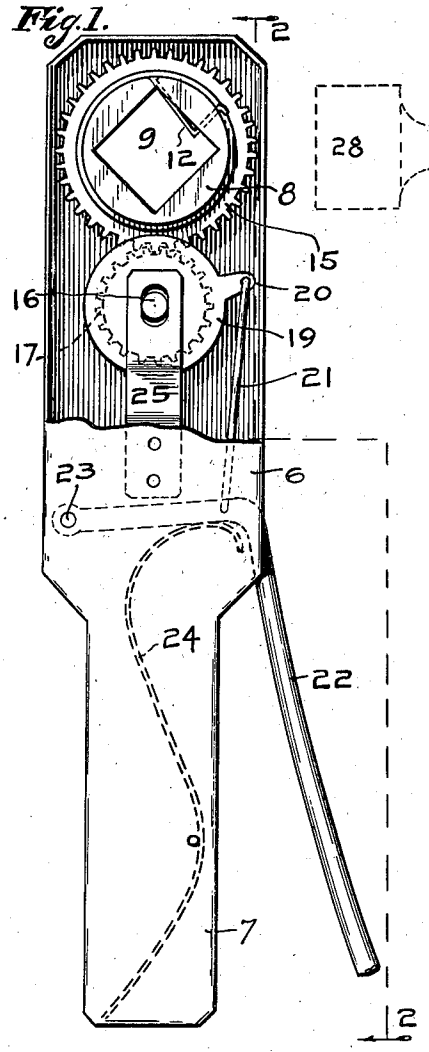
N. RUSK & D. GOCHENAUER.

WRENCH.

APPLICATION FILED NOV. 21, 1913.

1,121,668. Patented Dec. 22, 1914.

Fig. 1.



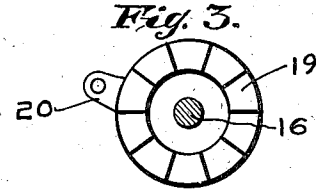


Fig. 3.

Fig. 4.

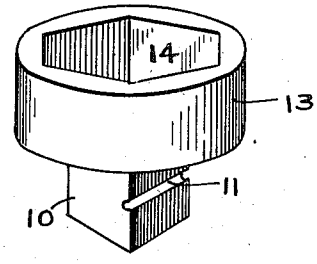


Fig. 2.

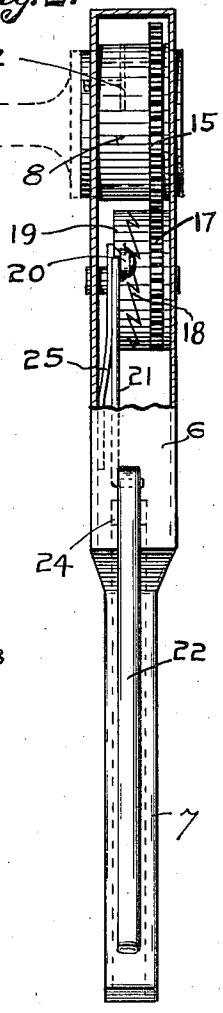
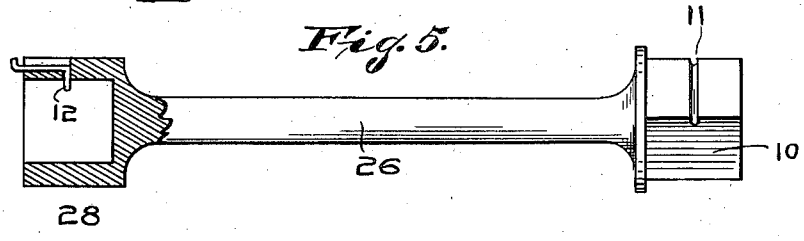


Fig. 5.



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UNITED STATES PATENT OFFICE.

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WRENCH.

1,121,668. Specification of Letters Patent. Patented Dec. 22, 1914.

Application filed November 21, 1913. Serial No. 802,294.

To all whom it may concern:

Be it known that we, NEWTON RUSK and DAVID GOCHENAUER, citizens of the United States, residing at San Diego, in the county of San Diego and State of California, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to tools for rotating nuts on the threaded ends of bolts, for rotating screwdrivers, augers, and the like, in locations which would otherwise be inaccessible, and the object of the invention is to provide a tool wherein said rotary movement will be imparted to the object to be rotated by a pressure of the fingers as in closing the hand, without requiring the usual oscillatory movement of the hand around the object to be rotated.

A further object of the invention is to provide a tool which will impart either a right or a left-hand rotation simply by turning the tool over in the hand.

The object also is to provide means for using sockets of different shapes and sizes, which will be readily interchangeable to suit the requirements of use.

We accomplish the above objects and other objects which will hereinafter appear, by the mechanism illustrated in the accompanying drawing, in which—

Figure 1 is a view in side elevation of our improved tool showing the outer portion of the housing broken away to illustrate the contained mechanism. Fig. 2 is an edge view of the tool in partial longitudinal section taken on the line 2—2 of Fig. 1. This view shows an extension bar for reaching parts to be operated upon, which could not directly or otherwise be conveniently reached, the extension being shown in the dotted lines in this figure. Fig. 3 is a view of the inner face of the driving ratchet disk. Fig. 4 is a perspective view of one of the sockets such as are provided for use without invention, and Fig. 5 is a side view and partial longitudinal section of the extension bar which is illustrated in dotted lines in Fig. 2.

Like characters of reference indicate like parts throughout the several figures of the drawings.

The main body portion 6 of the tool is hollow in order to provide a receptacle to receive the operative mechanism of our device. It has an integral handle-extension 7 the interior of which is also hollow and this interior communicates with the hollow body. The body and handle may be formed out of cast metal or stamped out of sheet metal, as circumstances or the convenience of manufacture may require.

A socket-holder 8 has cylindrical ends which are somewhat reduced in diameter from that of the body of the holder to form shoulders, and these reduced ends are journaled in corresponding openings formed in the opposite sides of the body 6 near the outer end of said body, the above-mentioned shoulders contacting with the inner side walls of the body 6. An angular opening 9 is formed through the socket holder 8 to receive the shank of removable and interchangeable sockets which are provided in assorted sizes and shapes with the tool. One of these sockets is shown in Fig. 4, in which 10 is the shank of the required size and shape to make a close sliding fit in the opening 9 of the holder 8. The shank 10 is provided with a transverse notch 11 to receive a spring catch 12 mounted in the holder 8 and projecting normally into the opening 9 of the latter. The head 13 of the socket is of any desired or required size and is provided with a recess 14 of the size and shape required to fit the object to be grasped by it.

Formed around the annular periphery of the socket-holder 8, and preferably integral therewith, is a wheel 15 having spur-teeth as shown, and supported by the side walls of the body 6 of the tool, between the socket-holder 8 and handle 7, is a shaft 16 upon which a spur gear wheel 17 is mounted. The wheel 17 is of less diameter than the spur gear wheel 15. The teeth of the two wheels 15 and 17 mesh with each other, as shown. The wheel 17 has a hub of large diameter as compared with the diameter of said wheel, and the flat face of the inner end of this hub is provided with an annular row of ratchet teeth 18. Mounted on the shaft 16 is a disk 19, the inner face of which,—that is the face adjacent to the toothed end of the hub of wheel 17, is provided with an annular row of ratchet teeth to engage with the teeth 18 of said hub. The disk 19 has an arm extension 20 which is connected by a link bar 21 with a handle-lever 22. The handle-lever 22 is pivoted at one end within the body 6 of the tool at 23, and passes out of said body through an opening in the opposite edge of the tool, and at its point of

exit, near where the link bar 21 is attached to it, it is bent nearly at right angles in the direction of the handle 7. The wall of the tool is slotted to allow for the unrestricted movement of the hand-lever 22, and it is normally elevated to the position shown in dotted lines in Fig. 1, presenting the external portion of the handle bar obliquely to the edge of the tool, by means of a leaf spring 24 seated in the hollow handle 7.

The tool is grasped in the operator's hand by his taking hold of the handle 7, including the handle-lever 22 within his grasp. Then by pressing the handle-lever 22 against the handle 7 and releasing it to allow it to resume the position shown in Fig. 1 by the action of spring 24, a rotary impulse will be delivered to the disk 19 and this may be repeated by repeating the movement of the handle-lever 22 by hand pressure. Each inward movement of the hand-lever 22 will move the arm 20 thereby rocking the disk 19. The disk 19 thus becomes a driving disk which by the engagement of its ratchet teeth with the teeth 18 of the hub of the gear wheel 17, imparts an intermittent rotary movement in a constant direction to the wheel 17, and that movement is transmitted through the toothed wheel 15 to the socket-holder 8.

The driving ratchet disk 19 is pressed constantly against the hub of the gear wheel 17 by a leaf spring 25, the fixed end of which is made so by being riveted to the body 6.

The extension bar 26 is used in making connection between the socket-holder 8 and some object considerably at one side of the said socket-holder and tool, so located as to be inaccessible without said extension. The bar 26 terminates at one end with a shank similar to the shank 10 having a notch 11 to engage the spring-catch 12. The opposite end of the extension bar 26 is provided with a head 28 having a socket to receive the same set of sockets as are provided for use with the socket-holder 8.

An auger, bit, screwdriver, nut, or any other object usually rotated by means of a wrench or a brace, can be manipulated by means of our invention, as above described.

In order to reverse the direction of rotation imparted to an object by the movement of the socket-holder 8, all that is necessary to do is to turn the tool over in the hand and insert the socket in the opposite side of the tool from which it was previously used. The opening 9 in the holder 8 is so formed as to permit the reversal of the socket in the manner just described, and the catch 12 is located to enter notch 11 which will be at the middle of the length of the shank.

While we have described our invention with more or less minuteness as regards details of construction and arrangement and as being embodied in certain precise forms, we do not desire to be limited thereto unduly or any more than is pointed out in the claims. On the contrary we contemplate all proper changes in form, construction, and arrangement, the omission of immaterial elements and the substitution of equivalents as circumstances may suggest or as necessity render expedient.

We claim—

1. In a hand tool, a body, a socket holder rotatively supported by said body and having an annular series of teeth, a smaller wheel having cog teeth engaging with those of the socket holder, said wheel having a hub with an annular series of ratchet teeth on one side, a disk having an annular series of ratchet teeth engaging with those of the hub and also having an arm extension longer than the radius of said second cog wheel, a lever, a link connecting the lever with said arm-extension whereby a pressure of the lever in one of the operator's hands while holding the tool will rock the disk and rotate the wheel, and means for holding the disk normally in contact with the toothed end of the hub of the wheel.

2. In a hand tool, a hollow body, a socket-holder rotatively supported by said body and mounted within said hollow body and having an annular series of teeth, a wheel of less diameter having cog teeth engaging with those of the socket-holder, said wheel having a hub with an annular series of ratchet teeth on one end, a disk having an annular series of ratchet teeth engaging with those of the hub and having an arm extension beyond the cogged periphery of the second wheel, a spring pressing the disk normally against the toothed end of the hub, a hand-lever pivoted at one end to said body and projecting into position to be operated by the pressure of the operator's hand while holding the tool, a link-bar connecting the lever with the arm-extension of said disk whereby the disk will be rocked by the swinging movement of the lever and a spring to move the lever in opposition to its movement under the pressure of the operator's hand.

In witness whereof, we have hereunto set our hands and seals at San Diego, Calif., this 4th day of November, A. D. one thousand nine hundred and thirteen.

NEWTON RUSK. [L. S.]
DAVID GOCHENAUER. [L. S.]

Witnesses:
N. W. Cooper,
J. G. Bollong.