F. K. LAWRENCE.

WRENCH.

APPLICATION FILED MAY 1, 1920.

1,401,615. **Patented Dec. 27, 1921.**

Fig. 1.

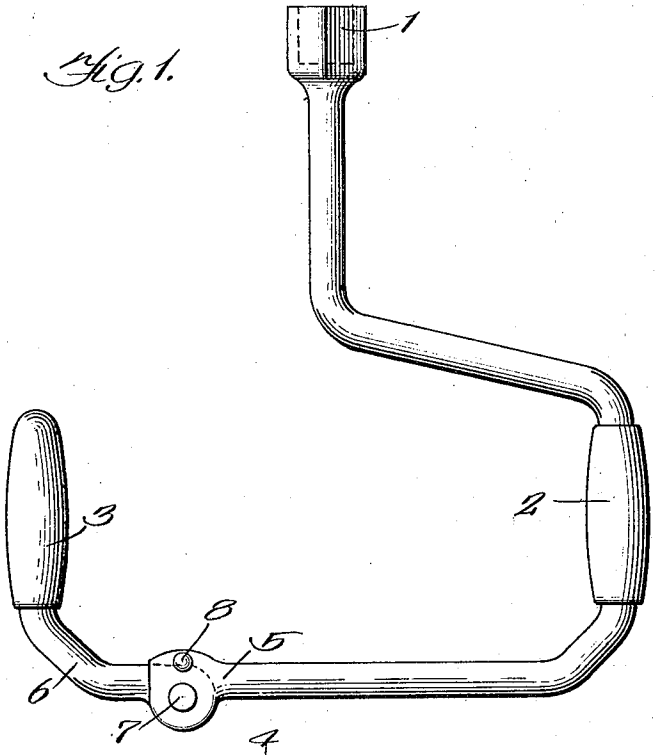


Fig. 2.

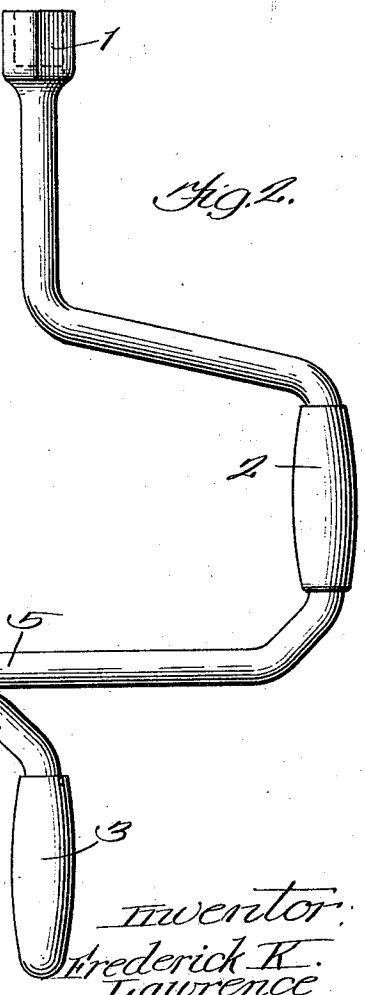


Fig. 3.

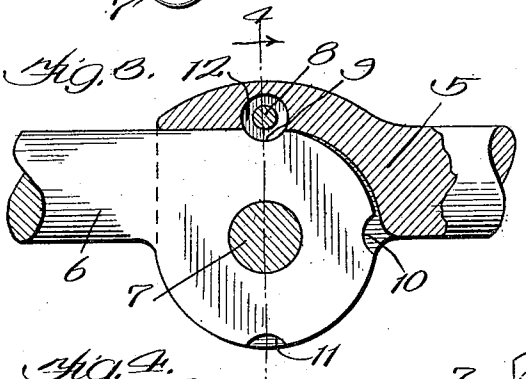
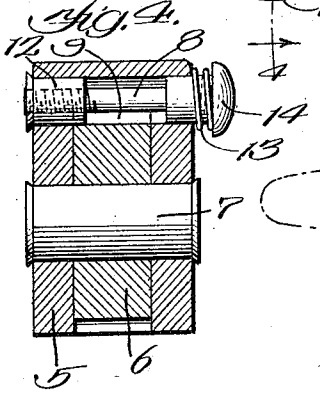


Fig. 4.



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WRENCH.

1,401,615. Specification of Letters Patent. **Patented Dec. 27, 1921.**

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To all whom it may concern:

Be it known that I, FREDERICK K. LAWRENCE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Wrenches, of which the following is a specification.

My invention relates to wrenches, particularly socket wrenches usable for various purposes, such as removing or tightening nuts or bolts in connection with demountable rims for vehicle tires. Such devices frequently become rusty and so tight that it is difficult to turn them with an ordinary socket wrench. The result is that the wrench will slip, rounding off the corners of the nuts and spoiling them. The object of my invention is to provide a wrench which will enable the operator to exercise a maximum torque, without slipping, when the nut is tight, and afterward obtain a maximum speed after the nut has become loosened but is still too tight to be turned with the fingers. My object is obtained by the construction shown in the accompanying drawing, in which—

Figure 1 is a side view of the wrench in condition to obtain maximum leverage;

Fig. 2 is the same view of the wrench showing it in condition to obtain maximum speed;

Fig. 3 is an enlarged view in section showing the hinge construction, and

Fig. 4 is a sectional view on the line 4—4, Fig. 3.

Like numerals denote like parts throughout the several views.

The wrench as a whole has certain of the characteristics of a brace used by carpenters, metal workers, garage men and others, for rotating bits, nuts and other objects. The socket 1 is adapted to engage the nut, bolt or other object to be turned. Handle 2 is analogous to the handle of an ordinary brace, while handle 3 is supplementary and is capable of occupying two positions, one as shown in Fig. 1, where it is opposite to handle 2 and is adapted to coöperate with it to produce a maximum turning moment or torque. In this position the handles are an equal distance from the axis of the wrench and an equal distance from the plane of the nut, which allows the operator to exercise a maximum amount of pressure by reason of the resulting couple. It also has the advantage of tending to hold the axis of the wrench coincident with the axis of the nut, which prevents any slipping of the socket on the nut and the resulting burring or rounding of the nut.

In the second position, as shown by the full lines in Fig. 2, handle 3 is in line with the axis of the wrench, allowing the operator to use the wrench as an ordinary brace and thereby attain a maximum speed.

Handle 3 is also capable of occupying an intermediate position, as shown by the dotted lines in Fig. 2, which can be used if conditions warrant.

The ability to adjust the supplemental handle to the two positions mentioned may be obtained by different constructions, but a suitable one is shown in the drawings in which a hinged joint is illustrated. As best shown in Figs. 3 and 4, the transverse portion 5 of the wrench is bifurcated and supports a pivot pin 7 to which the shank 6 of the supplemental handle 3 is pivoted. In the preferred construction, to lend great rigidity and strength, the portion 5 is in the form of a housing which incloses the pivoted end 6 both at the sides and back. The supplemental handle is locked in either of its acting positions by means of a locking pin 8 which is slidably mounted in the housing in such a manner as to move parallel to the pivot pin 7. This locking pin has a plug 12 at its inner end which is adapted to project part way into either one of the grooves 9, 10, 11 of the shank 6. When said plug is within its bearing and partly within the groove, it prevents the relative rotation of the parts. The plug may be slid out of the groove by pressing the head 14 inward. The pin is normally held in locking position by means of the helical compression spring 13 which surrounds the pin just beneath its head.

Operation: In use, when it is desired to loosen a nut, bolt or other device, the operator sets the wrench in the position shown in Fig. 1 which allows him to exercise the maximum torque. After the nut has been sufficiently loosened he presses the head of the locking pin 14 inward against the spring 13 thereby causing the plug 12 to slide beyond the end of groove 9, (see Fig. 4). This releases the shank 6 from its locked position and allows the operator to rotate the shank counterclockwise until it describes an arc of 180° when it is parallel with the transverse portion 5, and the handle 3 is coincident with the axis of the wrench. The operator may

release the head of the locking pin as soon as groove 10 has rotated past the locking pin; the spring 13 tends to force the pin to return to its normal position thereby causing the plug to slide partly into the groove 11 as soon as the latter has reached the pin, thus automatically locking the shank with handle 3 in a position allowing the operator to exercise a maximum speed.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A wrenching tool having a head adapted to engage the object to be turned, a shank by which the head is carried, a handle mounted on the shank at a distance from the axis of the shank and with its axis parallel thereto, and a second handle secured to the shank by a fixed pivot which constrains it to rotate in the plane in which the axis of the tool and the axis of the first handle lie, the second handle being adapted to rotate about its pivot to two positions, one coincident with the produced axis of the tool, and the other opposite to the first handle and at an equal distance from the axis of the tool.

2. A wrenching tool having a head adapted to engage the object to be turned, a shank whereto the head is fastened, a handle mounted on the shank at a distance from the axis of the tool in a given plane of rotation, and a second handle pivoted to the shank and adapted when in one position to lie coincident with the axis of the tool and when rotated approximately 180° about its pivot to lie in the aforesaid plane of rotation and at substantially the same distance from the axis of the tool as the first-mentioned handle.

3. A wrenching tool having a head adapted to engage the object to be turned, a shank bent to form a crank, an elongated handle mounted on the crank portion of the shank parallel to the tool axis to assist in turning the tool, the shank having a second handle pivoted thereto, said second handle being also elongated and adapted to occupy two positions, in one position being parallel to the first handle and on diametrically opposite sides of the axis of rotation, the movable handle being also adapted to occupy a position in which it is in line with the axis of the tool.

In witness whereof, I have hereunto subscribed my name.

FREDERICK K. LAWRENCE.