A. C. KLOPPER.

WRENCH.

APPLICATION FILED JUNE 21, 1921.

1,420,635. Patented June 27, 1922.

Fig. 1.

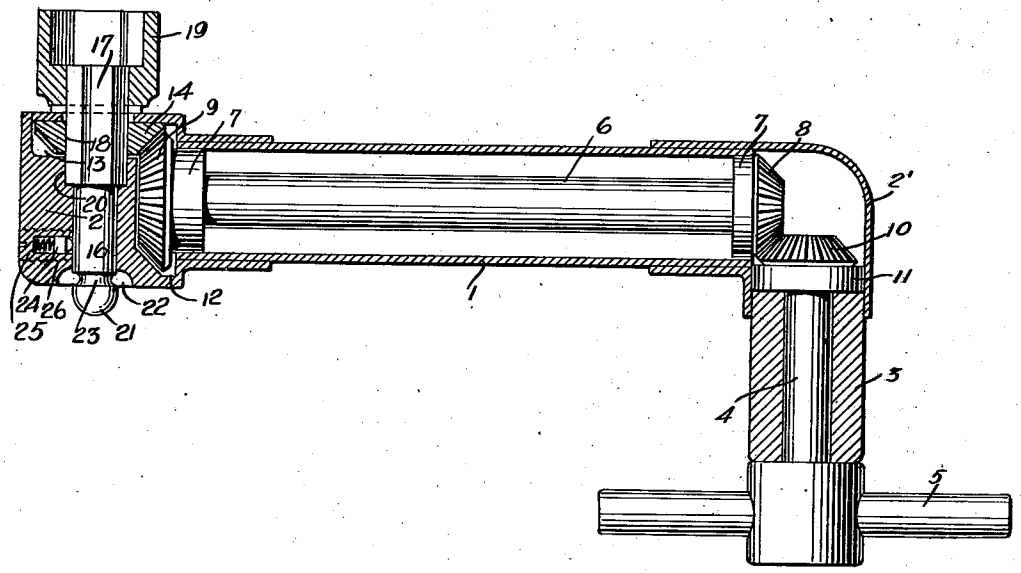


Fig. 2.

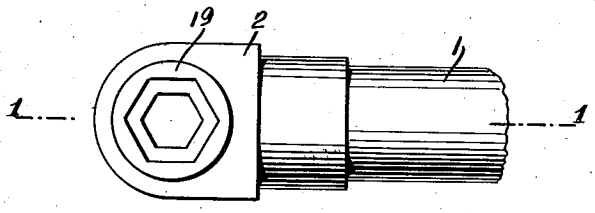
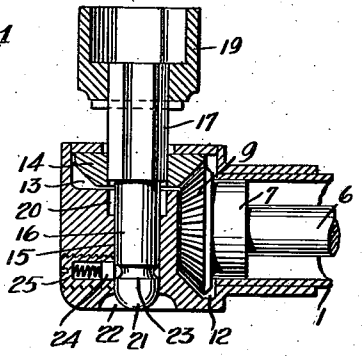


Fig. 3.



WITNESSES

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WRENCH.

1,420,635. Specification of Letters Patent. Patented June 27, 1922.

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To all whom it may concern:

Be it known that I, AUGUST C. KLOPPER, a citizen of the United States, and a resident of Asbury Park, in the county of Monmouth and State of New Jersey, have invented a new and Improved Wrench, of which the following is a full, clear, and exact description.

This invention relates to improvements in wrenches, an object of the invention being to provide a gear-driven socket wrench which can be conveniently used for removing or replacing nuts which are awkward to reach, and which is in the form of a crank arm so that the gears may be locked to allow the crank arm to be used as a lever wherever nuts are in more accessible places, or wherever greater leverage is desired to start the nut.

A further object is to provide a socket wrench of the character stated with improved means for locking the gears against movement or releasing said gears so as to permit their operation.

A further object is to improve upon the construction illustrated in my pending application filed November 6, 1920, and given Serial No. 422,225.

With these and other objects in view the invention consists in certain novel features of construction, and combinations and arrangements of parts as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings—

Figure 1 is a view in longitudinal section illustrating my improved wrench.

Figure 2 is a fragmentary elevation of the socket end of the wrench.

Figure 3 is a view in section on the line 3—3 of Figure 2, the parts in Figure 3 being shown in a different position from that illustrated in Figure 1.

1 represents a tubular arm or casing having angles or L's 2 and 2′ secured at its respective ends. These angles 2 and 2′ are oppositely positioned, as shown clearly in Figure 1, and in the angle 2′ one end of a bearing sleeve 3 is secured and provides rotary mounting for a drive shaft 4, the latter having an operating handle 5 fixed to its outer end.

A shaft 6 is located in the tubular casing or arm 1 and is provided with enlarged journals 7 adjacent its respective ends, which turn freely in the casing. Bevelled gears 8 and 9 are fixed or made integral to the respective ends of shaft 6 and the bevelled gear 8 meshes with a bevelled gear 10 on the inner end of shaft 4, said shaft 4 having an annular enlargement 11 adjacent the gear 10, said enlargement having a bearing against the inner end of the sleeve 3, as clearly shown in Figure 1.

The angle 2 preferably constitutes a casting having a recess 12 therein, in which the bevelled gear 9 is accommodated and is also made with a recess 13 in which a bevelled gear 14 is located and is in mesh with the gear 9. The angle 2 is made with a bore 15 in which a shaft 16 has sliding movement.

One end of this shaft 16 is made angular, as shown at 17, and is movable through an angular central opening 18 in gear 9 and on the outer end of this shaft 16, which projects through the angle 2, a nut-receiving socket 19 is fixed.

The angle 2 at the inner end of its bore 15 is formed with an angular recess 20 adapted to receive one end of the angular portion 17 therein and lock the gear 9 and the socket 19 against independent turning movement. The shaft 16, above referred to, is capable of a limited longitudinal movement so as to position the angular portion 17 either within the recess 20 or free from said recess, as shown in Figure 3, and when in the latter position, the gears are free to turn, so that the socket 19 can be turned by rotary motion imparted by the handle 5 through the medium of the shaft, as above explained. To facilitate this longitudinal movement of the shaft 16, said shaft is of appreciably greater length than the longitudinal dimension of the angle 2 and is formed preferably with a rounded head or end 21, and a recess 22 is formed in the angle 2 to provide ample finger space to permit manipulation of the shaft.

This shaft 16 is formed with an annular groove 23 adjacent the head 21, and a spring-pressed pawl 24 is provided in the bore 15 and adapted to ride into and out of this groove, so that when in the groove, it will hold the shaft in position to permit the gears to turn, and when out of the groove, the gears will be locked against turning movement, as shown in Figures 1 and 3. The spring-pressed pawl 24 is preferably engaged by a hollow screw 25 which is remov-

ably positioned in a screw threaded opening 26 in the angle 2 so that it can be conveniently removed, as occasion may require.

It will thus be noted that the wrench may be conveniently changed from a gear driven wrench to a lever wrench by the longitudinal movement of the shaft 16.

When the shaft is forced to one extreme position, as shown in Figure 1, which operation is performed by forcing the socket 19 inwardly, the angular portion 17 of the shaft 16 will lie in the recess 20 and lock the gear 14 against movement. When in this position, the device will act as a crank or lever to turn the nut or bolt-head with which the socket 19 is in engagement. When the shaft is forced to its other extreme position by pressure against the head 21, the angular portion 17 will be released from the recess 20 and the gear 14 will be permitted to turn, so that through the medium of the handle 5, shaft 4, gears 10 and 8, shaft 6, and gear 9, said gear 14 will be revolved and cause the shaft 16 to turn, thus imparting rotary motion to the socket 19.

By reason of the shape of the wrench, it can be conveniently used to engage a nut or bolt-head in awkward position, and the gears can be locked to allow the necessary leverage to start the nut and then the gears can be released to allow them to operate to turn the nut socket.

Various slight changes might be made in the general form and arrangement of the parts described without departing from the invention, and hence I do not limit myself to the precise details set forth, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of the appended claims.

I claim:

1. A wrench of the character described, comprising a tubular casing, a shaft supported by the casing at one end thereof and movable longitudinally in the casing, said shaft adapted when moved to one position to lock with the casing and against independent rotary movement, a nut-engaging socket at one end of the shaft, and means in the casing for imparting rotary movement to said shaft when the latter is in its unlocked position.

2. A wrench of the character described, comprising a casing, angles at the respective ends of the casing, one of said angles constituting a casting and having a longitudinal bore, a shaft movable in said bore and having an angular portion, said angle having a recess adapted to receive the angular portion when the shaft is in one extreme position to hold the shaft against rotary movement, a gear having an angular opening through which the shaft is movable, a socket fixed on one end of the shaft, a second gear meshing with the first-mentioned gear, and means in the casing for imparting a turning movement to said gears when the said shaft is moved longitudinally to a position to free its angular portion from the recess.

3. A wrench of the character described, comprising a tubular casing, angles at the respective ends of the casing oppositely positioned, a shaft in one of said angles at right angles to the casing, said shaft movable longitudinally and having an annular groove therein, a spring-pressed pawl adapted to engage in said groove and hold the shaft in one extreme position, a socket on one end of said shaft, said shaft having an angular portion, a bevelled gear having an angular opening receiving the angular portion of the shaft, said angle having a recess therein adapted to receive the angular portion of the shaft when the latter is in its extreme position, and means in the casing for imparting rotary movement to the gear.

4. A wrench of the character described, comprising a tubular casing, angles at the respective ends of the casing oppositely positioned, a shaft in one of said angles at right angles to the casing, said shaft movable longitudinally and having an annular groove therein, a spring-pressed pawl adapted to engage in said groove and hold the shaft in one extreme position, a socket on one end of said shaft, said shaft having an angular portion, a bevelled gear having an angular opening receiving the angular portion of the shaft, said angle having a recess therein adapted to receive the angular portion of the shaft when the latter is in its extreme position, a shaft positioned longitudinally in the casing, a sleeve secured to one of said angles and located at a right angle to the casing, an operating shaft in said sleeve, a handle on one end of the operating shaft, and bevelled gears connecting the shaft in the casing with the other shafts.

AUGUST CHARLES KLOPPER.

Witness:

HARRY J. BODINE.