June 2, 1931. C. M. STEWART 1,808,268

WRENCH

Filed Oct. 4, 1930

Fig. 1.

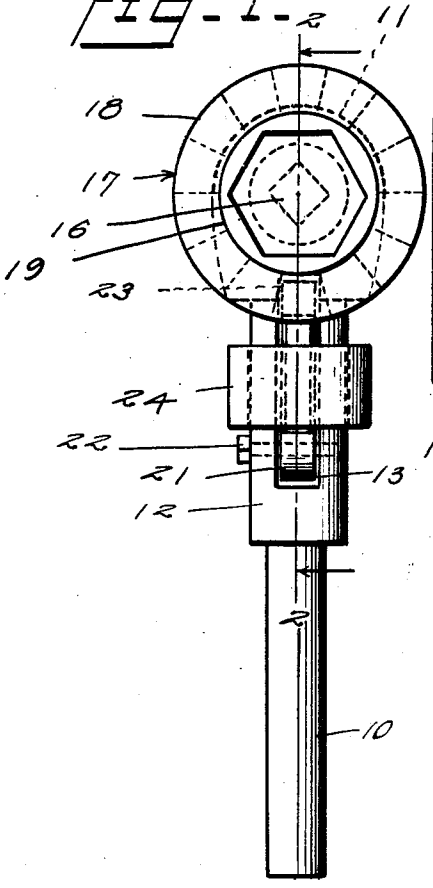


Fig. 2.

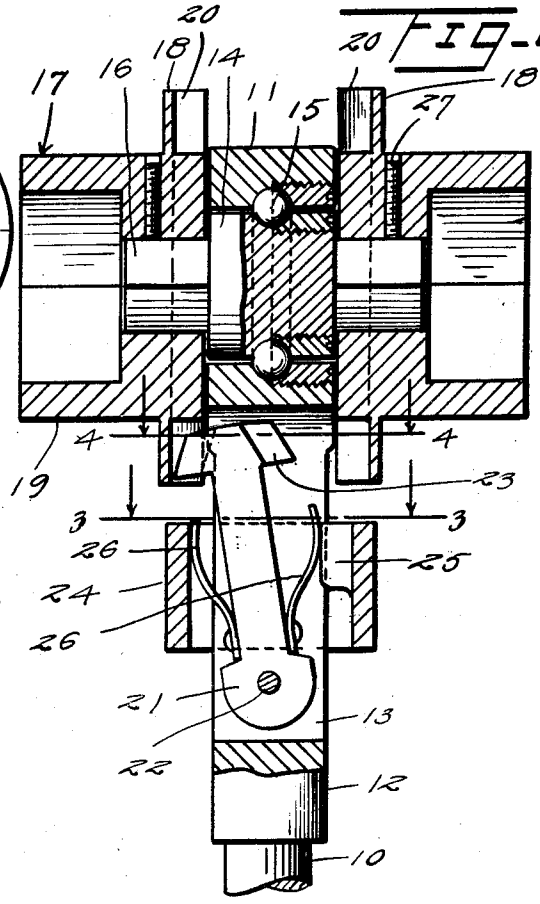


Fig. 4.

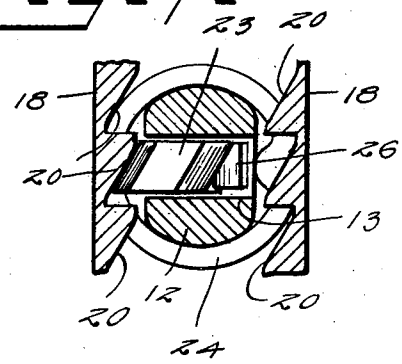
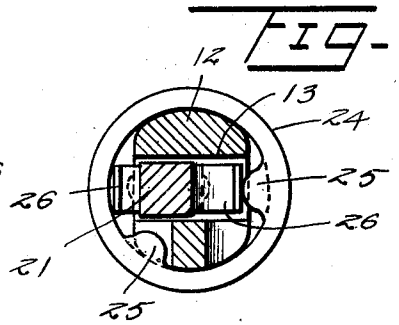


Fig. 3.



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UNITED STATES PATENT OFFICE

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WRENCH

Application filed October 4, 1930. Serial No. 486,423.

The present invention relates to wrenches and more particularly to a reversible socket wrench.

An object of this invention is to provide a wrench of this character which is so constructed that it may be used for either tightening or loosening a nut or bolt and which embodies a reversible ratchet mechanism.

Another object of this invention is to provide in a wrench of this character anti-friction means for the rotating elements of the wrench so as to facilitate the operation of the wrench in tightening or loosening nuts or bolts.

A further object of this invention is to provide a wrench of this character which may be used with removable socket elements so as to permit the use of the wrench for loosening or tightening the various sizes of bolts or nuts.

The above and various other objects and advantages of this invention will in part be described in and in part be understood from the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawings wherein:—

Figure 1 is a detail top plan view of a device constructed according to the preferred embodiment of this invention;

Figure 2 is a fragmentary enlarged sectional view partly in detail taken on the line 2—2 of Figure 1;

Figure 3 is a sectional view taken on the line 3—3 of Figure 2; and

Figure 4 is an enlarged sectional view taken on the line 4—4 of Figure 2.

Referring to the drawing wherein like numerals of reference designate corresponding parts throughout the several views, the numeral 10 designates generally a handle of suitable configuration which is provided at the outer end thereof with an annulus 11 and an intermediate enlarged portion 12, the enlarged portion 12 being longitudinally disposed with respect to the handle 10.

A spindle 14 is rotatably mounted in the annulus 11 and in order to facilitate rotation of the spindle 14, antifriction elements 15 are mounted within the annulus 11 and engage the spindle 14 so as to prevent lateral movement of the spindle with respect to the handle structure 10 and at the same time permit the free rotation thereof, it being understood that the spindle 14 is preferably mounted at substantially right angles to the longitudinal axis of the handle 10.

The body of the spindle 14 is preferably round and the outer ends of the spindle are restricted as at 16 and are preferably square or angular in cross section so as to removably receive a nut or bolt engaging member 17. The member 17 comprises an inner plate section 18 and an outer socketed portion 19, the inner plate section 18 being relatively larger in diameter than the outer section 19. The inner surface of the plate section 18 is provided with a plurality of radially inclined teeth 20, and a rockable pawl member 21 is loosely positioned in the slot 13 of the intermediate section 12, the pawl member 21 being rockably mounted on a pivot or pintle 22.

The outer end of the pawl member 21 is provided with outstanding and oppositely directed pawl members 23, the members 23 being so constructed as to turn the nut engaging member 17 mounted on one side of the annulus 11 in a clockwise direction, and to turn the member 17 on the opposite side of the annulus in an anti-clockwise direction so as to either tighten or loosen a nut or bolt. In like manner, the ratchet teeth 20 on one of the plate members 18 are so positioned as to turn the member 17 in a clockwise direction on one side of the annulus 11 and to turn the member 17 on the opposite side in an anti-clockwise direction.

An eccentric ring or annulus 24 is loosely mounted about the intermediate section 12 and is provided with inwardly extending eccentric portions 25, the eccentric portions 25 being adapted to engage springs 26 carried on the opposite faces of the pawl member 22 intermediate the opposite ends of the pawl member. The inwardly projecting portions 25 are so positioned within the circle of the annulus 24 that when one of the projections 25 engages the spring 26, the other projection 25 is positioned out of alignment with the

opposite spring 26 so as to permit the opposite spring to engage the inner periphery of the ring 24, the spring 26 which is in contact with the projection 25 being placed under tension by the projection 25 so as to swing the pawl member 21 toward the ratchet portion 18 on the opposite side or diametrically opposed to the projection 25.

In order to retain the nut engaging member 17 on the spindle 14, a set screw 27 or the like is threadably mounted in the nut engaging member 17 and is adapted to engage the restricted outer end portions 16 of the spindle so as to prevent longitudinal movement of the nut engaging member 17 with respect to the spindle. However, if desired, the ratchet portion 18 may be constructed separately from the socket portion 19 so that when the nut engaging member 17 is changed, it is only necessary to remove the socket portion 19.

In the operation of this device, the annulus or eccentric ring member 24 may be rotated about the enlarged body portion 12 so as to swing the pawl 21 into engagement with the selected ratchet 18 whereupon the socket or nut engaging member 17 may be positioned on the head of the bolt or about the nut. The handle 10 may then be oscillated or swung so as to carry therewith the pawl 21 and coactively rotate therewith the ratchet portion 18 and the socket portion 19.

It will be obvious from the foregoing that the wrench member herein disclosed may be used so as to either insert or remove a nut or bolt without removing the wrench from the bolt until the operation has been completed and that where a nut or bolt is positioned in a relatively confined space, the wrench may be oscillated or rocked sufficiently to permit the ratchet 21 to successively engage the ratchet teeth 20. It will be noted that by mounting the teeth 20 on a round plate so that the edges of the teeth are radially inclined with the axis of the spindle, the outer portions of the teeth will be larger than the inner portions, thereby providing relatively reinforced teeth which are reinforced at the point of the greatest pressure, namely, the outer edges thereof.

It is of course understood that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims:

What is claimed is:

1. A wrench of the character described comprising a handle, an annulus mounted on the outer end of the handle, a spindle rotatably mounted in the annulus, a ratchet mounted on each end of the spindle, a reversible pawl member pivotally carried by the handle, a socket element mounted on the spindle and extending outwardly of the ratchet member, and an eccentric ring carried by the handle and engaging said pawl whereby to swing said pawl into engagement with a selected ratchet member.

2. A wrench of the character described comprising a handle, an annulus secured to the outer end of the handle, said handle having an enlarged intermediate portion, said intermediate portion having a longitudinally disposed slot therethrough, a spindle rotatably mounted in said annulus, said spindle having restricted opposite end portions, a removable nut engaging member mounted on each end of the spindle, said nut engaging member having a toothed inner face portion, a reversible pawl, means for rockably mounting said pawl in the slot of said intermediate portion, yieldable means carried by the pawl, and an eccentric member loosely carried by said intermediate portion and engaging said yieldable means whereby to yieldably swing said pawl into engagement with a selected face of one of said nut engaging members.

3. A wrench of the character described comprising a handle, an annulus secured to the outer end of the handle, a spindle rotatably mounted in said annulus, anti-friction elements carried by said annulus and engaging said spindle whereby to facilitate rotation thereof, said spindle having restricted opposite end portions extending outwardly of said annulus, a pair of nut-engaging members having toothed inner face portions, means for removably securing said nut engaging members to the restricted ends of said spindle, the toothed portions of said nut-engaging members being oppositely directed one from the other, a reversible pawl rockably mounted in said handle, yieldable means carried by said pawl, a rotatable annulus loosely mounted on said handle, and inwardly projecting means carried by said latter annulus and adapted for engagement with said yieldable means whereby to swing said pawl into engagement with a selected nut-engaging member.

In testimony whereof I hereunto affix my signature.

CHARLES M. STEWART.