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REMOTELY CONTROLLED RATCHET WRENCH

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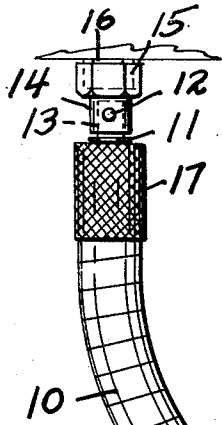


Fig. 1

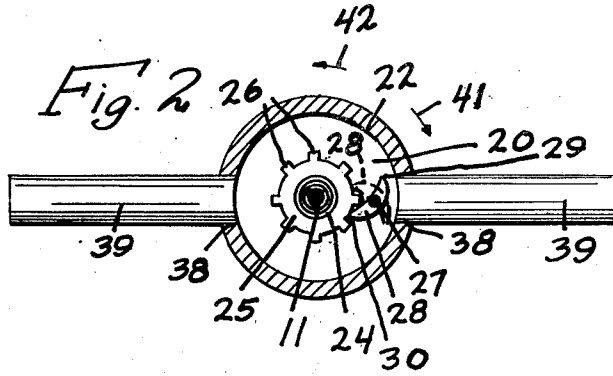


Fig. 2

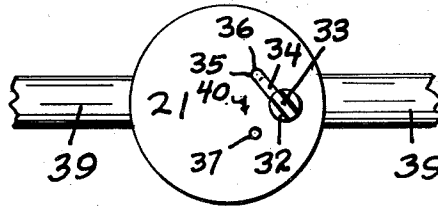
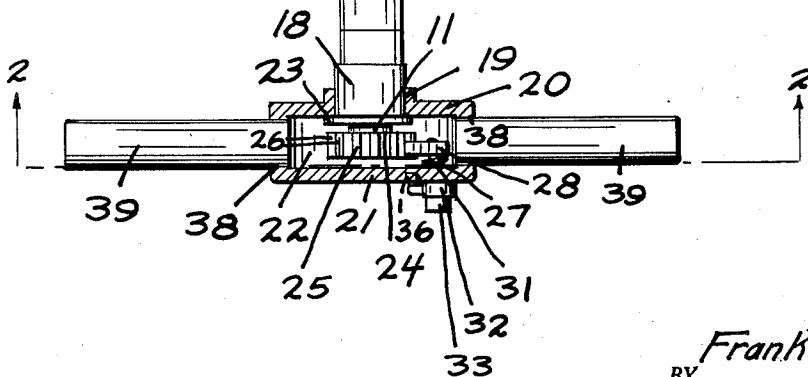


Fig. 3



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1

2,814,224

**REMOTELY CONTROLLED RATCHET WRENCH**

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2 Claims. (Cl. 81—54)

My invention relates to a remotely controlled ratchet wrench.

An object of my invention is to provide a wrench which will enable the operator to attach a nut or a bolt where such nut or bolt is normally inaccessible, and with means also for tightening the bolt securely, or removing the same.

A further object of my invention is to provide the above results in a simple construction.

With these and other objects in view, my invention consists in the construction, arrangement, and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of the tool with a portion thereof being taken in section,

Figure 2 is a sectional view of Figure 1 taken along the lines 2—2 thereof, and

Figure 3 is an end view of the casing and turning handles.

My invention contemplates the provision of a wrench which can be used for securing remotely positioned bolts or nuts.

I have used the character 10 to designate a spirally wound steel flexible conduit which can be bent to a variety of configurations, and received within the conduit 10 is a lengthened flexible cable 11, this flexible cable being of the usual closely wound wire type, and which is adapted to carry the necessary torque, the cable 11 being attached by means of a suitable pin 12 to a square member 13 which is received within the socket portion 14, which socket portion 14 is attached to a socket head 15, which member 15 is preferably hexagon-shaped and is adapted to receive the nut 16 which is to be tightened, it being assumed that the nut 16 is in a more or less inaccessible location and which can not be tightened by means of the usual flat wrench or socket wrench. The pin 12 will allow the attachment of a variety of sizes of the socket 15, and attached to the conduit 10 is the knurled stationary ferrule 17. The conduit 10 and cable 11 can be of any desired length, and the conduit 10 terminates in a further collar or ferrule 18. Rotatably receiving the collar 18 at 19 is the casing 20 which can thus be rotated freely about the collar 18, the casing 20 including the end wall 21 and annular wall 22, the ferrule 18 merging with the integral collar 23 to serve to retain the casing against displacement from the ferrule 18.

The flexible cable 11 is firmly secured at 24 to a ratchet member 25 having the spaced teeth 26, and secured to the wall 21 is a short pin or shaft 27, and mounted on the shaft 27 is a pawl member 28 having the pointed ends 29 and 30, this pawl member being resiliently attached by means of the spring 31 to the pin 27, the pin 27 being further attached to the outer circular member 32 having the finger grasping portion 33, and also having the extending arm 34 which terminates in the inwardly extending prong 35 which is adapted to

2

be received within either opening 36 or 37 in the casing wall 21.

Firmly secured at 38 within the wall 22 of the casing 20 are a pair of outwardly extending round bars 39.

The tool is used in the following manner. Normally, the area around the inaccessible nut has sufficient space to insert the fingers of the hand, and the socket 15 is placed over the nut 16 as shown, with the fingers of one hand holding the ferrule 17. Next, the other hand grasps the bars 39 and the bars and casing 20 are rotated in the direction of the arrow 41 (see Figure 2) the pawl point 30 being set for tightening the nut, whereby the point 30 will successively engage successive teeth 26, and after each slight reverse motion, the pawl will contact another tooth each time, without in any way rotating the cable 10, and as a result, the flexible cable 11 will cause the socket 15 to rotate until the nut 16 is firmly seated, the bars 39 providing sufficient leverage to the ratchet-engaging portions for this purpose.

As a result, the nut is firmly secured, and as explained above, various sizes of sockets can be employed with the same tool.

For the tightening operation as shown in Figure 3, the prong 35 is set in the opening 36, with the pawl being in the solid position shown in Figure 2.

If it is desired to remove the nut, the pawl is swung to the dotted position shown in Figure 2 by rotating the member 33 and arm 34 in the direction of the arrow 40, in which the pawl will occupy the dotted position shown in Figure 2, and wherein by reverse movement in the direction of the arrow 42, the pawl will engage the teeth in the reverse manner and the nut will be loosened. Therefore, by virtue of this construction, the tool can tighten or loosen a nut in relatively inaccessible locations.

It will now be seen that I have provided the advantages mentioned in the objects of my invention, with various other advantages being readily apparent.

Some changes may be made in the construction and arrangement of the parts of my invention without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. A remotely controlled ratchet wrench comprising a flexible conduit, a flexible cable in said conduit, a nut-engaging member attached to one end of said flexible cable, means for rotating the other end of said flexible cable to tighten said nut comprising a ratchet member, a casing enclosing said ratchet member, handles secured to said casing, a pawl in said casing for engaging said ratchet member, means for reversing said pawl, whereby the rotation of said cable can be reversed.

2. A remotely controlled ratchet wrench comprising a flexible conduit, a flexible cable in said conduit, a nut-engaging member attached to one end of said flexible cable, means for rotating the other end of said flexible cable to tighten said nut comprising a ratchet member, a casing enclosing said ratchet member, handles secured to said casing, a pawl in said casing for engaging said ratchet member, means for reversing said pawl, whereby the rotation to said cable can be reversed, said ratchet member including a plurality of circumferentially spaced teeth for engaging said pawl, said pawl including a short shaft upon which said pawl operates, said shaft extending through said casing, said shaft being pivoted in said casing, a manually operable arm member attached to said shaft outside of said casing, means for selectively positioning said arm to provide rotation of said ratchet member in either direction.

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3

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