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GEARED RATCHET WRENCH
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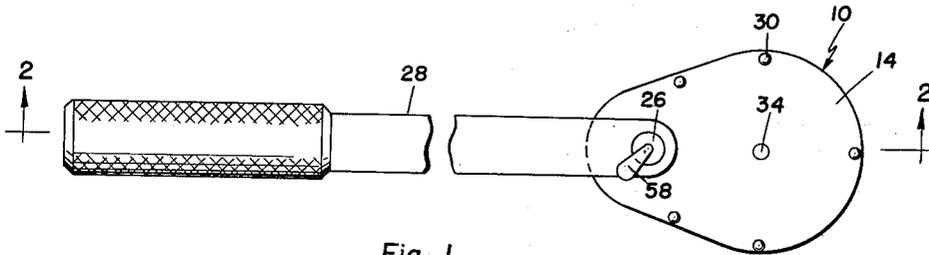


Fig. 1

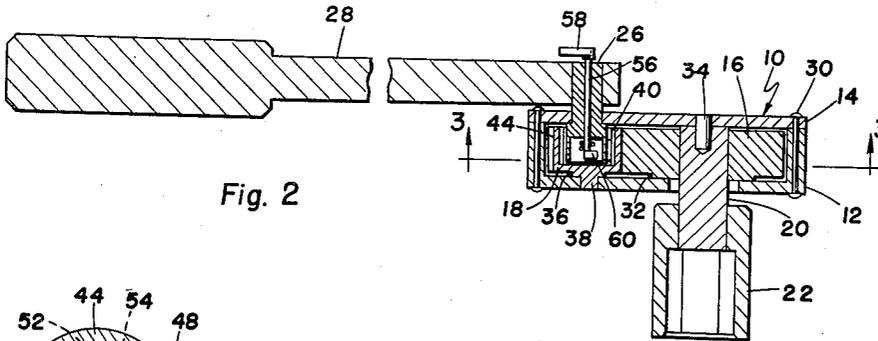


Fig. 2

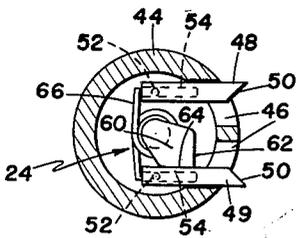


Fig. 5

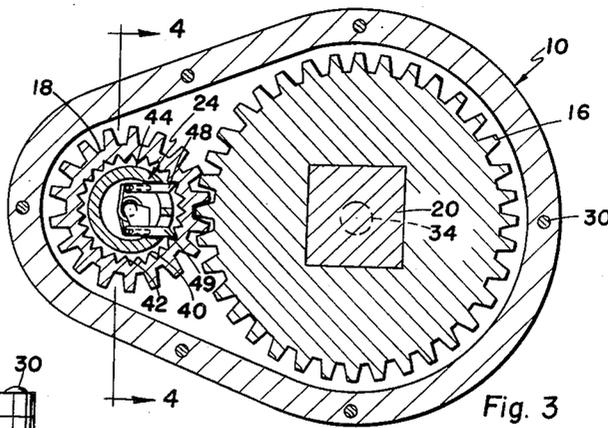


Fig. 3

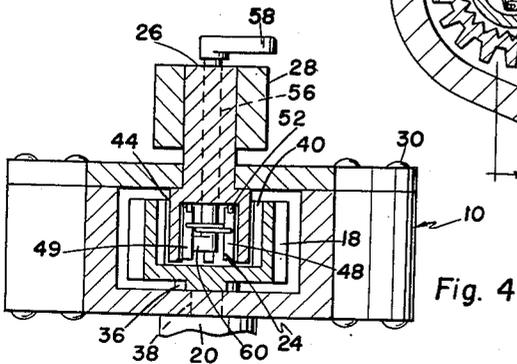


Fig. 4

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AGENTS FOR APPLICANT

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3 Claims. (Cl. 81-57)

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The present invention relates generally to wrenches and more particularly to a geared ratchet wrench.

The primary object of this invention is to provide a ratchet wrench having reduction gears in the driving head to increase the torque of the wrench without increasing the size.

Another object of this invention is to provide a geared ratchet wrench which may be used with many types of conventional interchangeable socket heads and the like.

Another object of this invention is to provide a geared ratchet wrench having a compact, dependable and easily accessible reversing means combined with the reduction gear mechanism.

Another object of this invention is to provide a geared ratchet wrench which is adapted for fabrication from many different materials, so that the choice of material can be according to the dictates of availability and price considerations, the exact sizes and proportions being matters easily determined to suit particular conditions and needs.

Another object of this invention is to provide a geared ratchet wrench which is inexpensive and practicable to manufacture.

Finally, it is an object to provide a geared ratchet wrench of the aforementioned character which is simple, safe and convenient to operate, and which will give generally efficient and durable service.

With these and other objects definitely in view, this invention consists in the novel construction, combination and arrangement of elements and portions, as will be hereinafter fully described in the specification, particularly pointed out in the claims, and illustrated in the drawing which forms a material part of this disclosure and wherein similar characters of reference indicate similar or identical elements and portions throughout the specification and throughout the views of the drawing, and in which:

Fig. 1 is a plan view of the wrench.

Fig. 2 is a sectional view taken on the line 2-2 of Fig. 1.

Fig. 3 is an enlarged sectional view taken on the line 3-3 of Fig. 2.

Fig. 4 is a sectional view taken on the line 4-4 of Fig. 3.

Fig. 5 is an enlarged sectional view similar to Fig. 3 but showing only the ratchet mechanism for clarity.

Referring now to the drawing, the wrench includes a gear head 10 which comprises a casing 12 and a cover plate 14. Within the casing 12

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are a driven gear 16 and a pinion or smaller drive gear 18 enmeshed therewith, the driven gear having a square shank 20 which projects through the casing and constitutes the driving shaft for the socket head 22. The ratchet mechanism 24 is contained in the drive gear 18, from which a shaft 26 extends upwardly and is fitted with a handle 28.

The cover plate 14 is secured to the casing 12 by means of rivets 30 or the like to maintain an effective seal against foreign matter or moisture. The driven gear 16 has a shoulder 32 which bears on the casing 12, said driven gear being aligned by a pin 34 which is secured in the shank 20 and is journaled in the cover plate 14. The drive gear 18 has a shoulder 36 which bears on the casing 12, said shoulder having an extended stub shaft 38 journaled in the casing to ensure accurate alignment of the gears. The gear train may include three or more gears.

The drive gear 18 is provided with a serrated bore 40, the serrations serving as ratchet teeth 42. On the lower end of the shaft 26 is a tubular hub 44 which is positioned concentrically in the bore 40, said hub having a pair of adjacent slots 46 through which the pawls 48 and 49 extend. These pawls 48 and 49 have chamfered ends 50 which engage the ratchet teeth 42, and are slidably mounted in the hub 44. The pawls are aligned by means of locating pins 52 embedded in the hub 44, said pins being keyed in longitudinal slots 54 in one edge of each pawl.

Extending axially through the shaft 26 and mounted therein for manual oscillation is a rod 56, at the upper end of which is fitted a lever 58. The lower end of the rod 56 is shaped to form a cam 60 having a pair of adjacent flat faces 62 and 64 disposed substantially normal to each other. These flat faces 62 and 64 may be brought to bear selectively against the pawls 48 and 49 by partial rotation of the rod 56 by means of the lever 58. Thus each pawl may be locked securely against the outer edge of its slot 46 as illustrated in Fig. 5. The pawls 48 and 49 are biased against the ratchet teeth 42 by a coil spring 66 fitted around the rod 56, the ends of said spring resting against the rear edges of said pawls.

If reference be had to Fig. 3, it will be evident that the pawl 48 is free to move in the slot 46 so that the drive gear 18 may rotate freely in a clockwise direction. However, the drive gear is prevented from counterclockwise rotation by the cam 60. By reversing the cam 60, the direction of free rotation of the drive gear 18 may,

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of course, be reversed, thus providing for reversible operation of the wrench. The reduction ratio of the gears enables considerable torque to be applied to the socket head 22 with a comparatively small pressure on the handle 28.

The operation of this invention will be clearly comprehended from a consideration of the foregoing description of the mechanical details thereof, taken in connection with the drawing and the above-recited objects. It will be obvious that all said objects are amply achieved by this invention.

Further description would appear to be unnecessary.

It is understood that minor variation from the form of the invention disclosed herein may be made without departure from the spirit and scope of the invention, and that the specification and drawing are to be considered as merely illustrative rather than limiting.

I claim:

1. A geared ratchet wrench including a gear head; said gear head comprising a closed casing, a driven gear rotatably mounted in said casing, a smaller drive gear rotatably mounted in said casing and enmeshed with said driven gear, a socket head removably attached to said driven gear, said drive gear having a bore, said bore having a plurality of internal ratchet teeth, a reversible ratchet mechanism operatively engaging said ratchet teeth, and a handle operatively connected to said ratchet mechanism.

2. A geared ratchet wrench including a gear head; said gear head comprising a closed casing, a driven gear rotatably mounted in said casing, a smaller drive gear rotatably mounted in said casing and enmeshed with said driven gear, a socket head removably attached to said driven

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gear, said drive gear having a bore, a hub concentrically mounted in said bore, a pair of spaced pawls slidably and pivotally mounted in said hub, said pawls being selectively engageable with said ratchet teeth, means for locking said pawls selectively against the ratchet teeth, said hub having an extended shaft, and a handle attached to said shaft.

3. A geared ratchet wrench including a gear head; said gear head comprising a closed casing, a driven gear rotatably mounted in said casing, a smaller drive gear rotatably mounted in said casing and enmeshed with said driven gear, a socket head removably attached to said driven gear, said drive gear having a bore, a hub concentrically mounted in said bore, a pair of spaced pawls slidably and pivotally mounted in said hub, said pawls being selectively engageable with said ratchet teeth, said hub having an extended shaft, a rod rotatably mounted axially in said shaft, a cam on the lower end of said rod, said cam being selectively engageable with said pawls so that said pawls are selectively locked against said ratchet teeth, and a handle operatively connected to said shaft.

References Cited in the file of this patent

UNITED STATES PATENTS

30. Number	Name	Date
417,829	Lowell	Dec. 24, 1889
471,765	Wever et al.	Mar. 29, 1892
872,633	Anspach	Dec. 3, 1907
1,614,534	Norton	Jan. 18, 1927
35 2,520,443	Seaquist	Aug. 29, 1950
2,578,686	Fish	Dec. 18, 1951
2,634,630	Johnson	Apr. 14, 1953