

Aug. 21, 1951

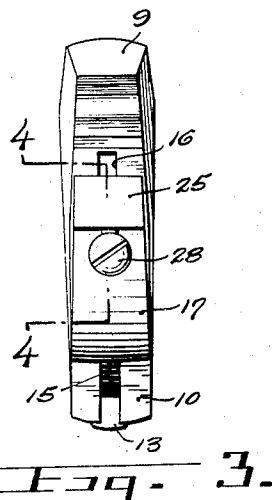
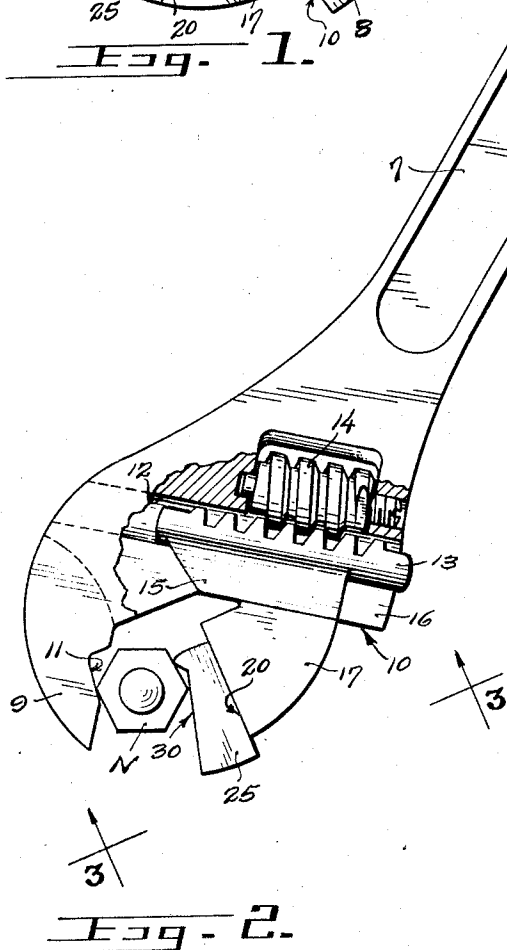
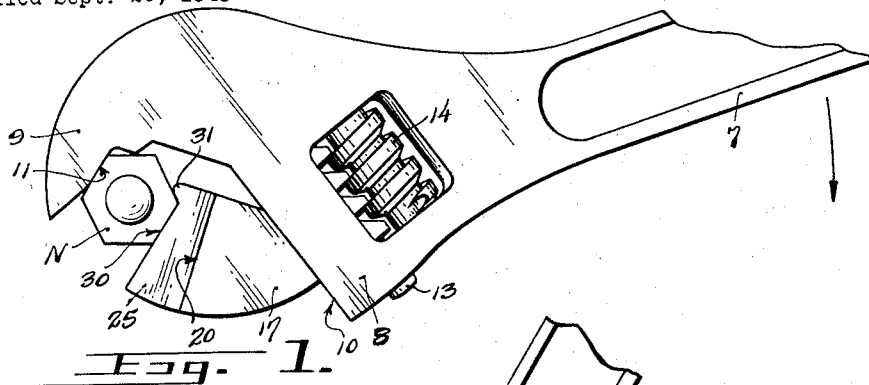
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2,565,154

OPEN END RATCHET WRENCH

Filed Sept. 20, 1948

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

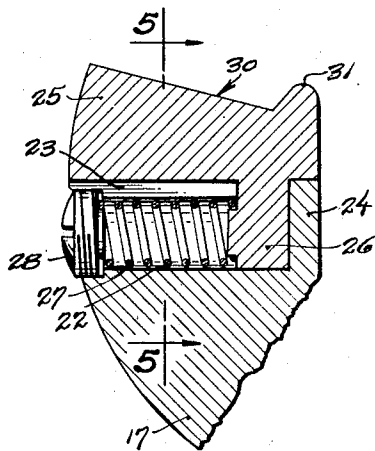


Fig. 4.

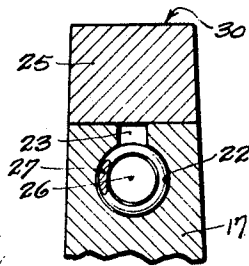


Fig. 5.

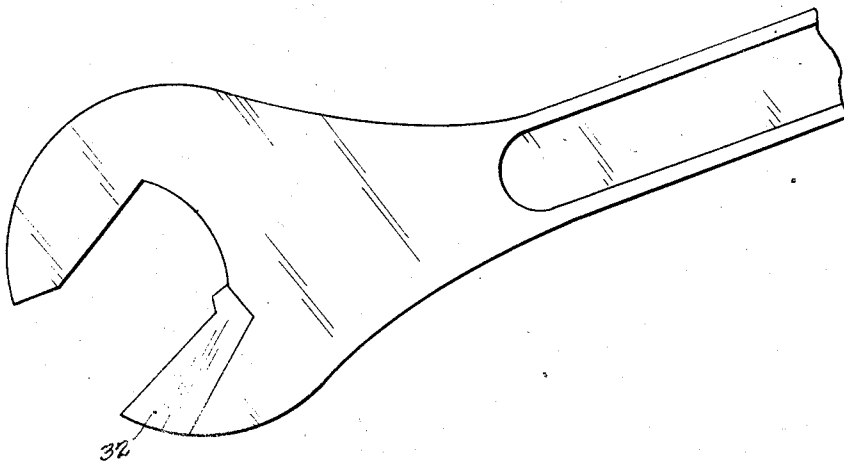


Fig. 6.

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UNITED STATES PATENT OFFICE

2,565,154

OPEN-END RATCHET WRENCH

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Application September 20, 1948, Serial No. 50,220

1 Claim. (Cl. 81-179)

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This invention relates to open-end wrenches, and its principal object is to provide a wrench of this character which admits of a ratcheting action and hence, in order to impart multiple turns to a gripped object, need be itself operated reciprocally through only a partial turn. The invention lends itself equally well to the type of open-end wrench having either a fixed or an adjustable jaw span. As further and general objects, the invention aims to provide a ratcheting implement which will be simple, strong and easily manipulated, and which will reliably perform the work for which it is intended.

The invention consists in the novel construction and in the adaptation and combination of parts hereinafter described and claimed.

In the accompanying drawings:

Figure 1 is a fragmentary plan view portraying an end wrench of the adjustable type constructed in accordance with the preferred teachings of the present invention, and with the parts shown in the positions which they occupy when the wrench is being turned in the working stroke of its reciprocal ratcheting movement.

Fig. 2 is a fragmentary view partly in plan and partly in section and showing the wrench as being moved in the return stroke of its reciprocal ratcheting action, the scale here used being enlarged from that of Fig. 1.

Fig. 3 is an elevational view looking at the end of the wrench from a vantage point indicated at 3-3 in Fig. 2.

Fig. 4 is a fragmentary longitudinal vertical section taken to a yet larger scale on line 4-4 of Fig. 3.

Fig. 5 is a transverse vertical section on line 5-5 of Fig. 4; and

Fig. 6 is a fragmentary plan view illustrating an end wrench of the non-adjustable type embodying the ratcheting feature of the present invention.

Referring to said drawings, the numeral 1 designates the stock or handle part of a wrench having at its outer end a head 8 from which a leg 9 projects outwardly and serves as one of the two jaws of the wrench.

In a manner common to adjustable end wrenches, the body proper of the head presents a flat slide-face 10 extending approximately at right angles to the face 11 of the jaw 9, and drilled through the head parallel with this slide-face is a hole 12 in which is received a rack member 13 adjustably positioned by a worm 14. A rib 15 integral with the rack projects outwardly to the slide-face through a slot 16 in the head, and

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integrated in turn with the rib is a thickened block 17 which rides by its bottom shoulders upon the slide-face. This block is itself provided with a flat slide-face 20, the plane of which diverges outwardly relative to the plane occupied by the jaw-face 11. Said block is drilled and slotted, as at 22 and 23, much in the same manner as the head excepting that the drilling is interrupted short of the inner end limit of the block to leave a stop-wall 24.

The other jaw of the wrench, and which I denote by 25, is arranged to seat upon the slide-face 20, and there is provided at the inner end of this jaw a tongue dependency 26 finding a sliding fit within the drill-hole 22. Such tongue is subjected to the pressure of a spring 27 for yieldingly urging the same into bearing engagement with the stop-wall 24, the other end of the spring bearing against a removable screw 28.

The gripping face 30 of the jaw 25 desirably has a very slight inward divergence relative to the gripping face 11 of the other jaw 9, and also is preferably provided at the inner end limit with a projecting lip 31.

Proceeding now to a description of the non-adjustable wrench illustrated in Fig. 6, substantially the only departure from the previously described wrench is that the block member 17 is built into the head and becomes a solid part of the latter. The sliding jaw, here denoted 32, is or may be identical both in point of construction and mounting with the sliding jaw 25.

It is thought that the manner in which the tool operates will be apparent from an inspection of Figs. 1 and 2. Assuming that the worm has been turned in the degree necessary to draw the movable jaw 25 into firm engagement with an object such as the indicated nut N, a swing of the wrench in the clockwise direction indicated by the arrow of Fig. 1 will operate to move the nut in a corresponding direction, or which is to say such as to tighten the nut if the threads are right-hand. Now, upon reversing the direction of swing as indicated by the arrow of Fig. 2, the movable jaw will move outwardly along its slide against the yielding resistance of the spring 27, progressively enlarging the jaw spread until the two jaws will slip over diametrically opposite points of the nut. The spring then asserts its compression load to return the movable jaw inwardly along its slide into a working position whereat opposite flats of the nut are again gripped by the opposing jaw-faces. I find it desirable, as a means of facilitating the ratcheting action, that the face of the jaw 11 be cut back at the outer end. The

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advantage of this cut-back which gives to the inner face of the fixed jaw an obtuse angular shape in profile, is that it permits the flat of the nut which was previously engaged by the gripping face 11 to roll over the crest defined between said angular faces, giving relief to the point of the nut and consequently requiring only a negligible reciprocal travel of the jaw 25 in order that the two jaws may be freed from one diametrically opposite pair of flats on the nut and take a new purchase upon a following pair of said flats. Without the relief face the jaw 25 does, in fact, evidence a noticeable tendency to bind.

The invention, and the manner of its usage, is believed to be clear from the foregoing. Minor changes in the details of construction can be resorted to without departing from the spirit of the invention and it is accordingly my intention that the hereto annexed claim be construed with the broadest interpretation which the employed language permits.

What I claim is:

A wrench for use with polygonal nuts comprising a handle having upon its outer end a head of furcate form characterized in that the inner opposed faces of the two fork arms diverge outwardly, one of said fork arms serving as a fixed jaw and the other being bored longitudinally on an axis paralleling its said inner face and having a slot of less width than the bore connecting the face with the bore, a slidable block of wedge shape serving as a jaw complement of said fixed jaw and slidably mounted on said bored fork arm, said block presenting a tongue dependency extending through said slot and fitting the bore, a screw-plug removably received in the outer end

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of the bore, a compression spring bearing at one end upon the screw-plug and by the other end upon the tongue for yieldingly urging the block inwardly, the inner face of the fixed jaw having an obtuse angular shape with the inner arm of said angle defining a face for gripping a flat of the nut and the outer arm of said angle defining a relief face, said relief face promoting ease of ratcheting by accommodating a point of the nut as the wrench is moved relative to the nut to free itself from one pair and take a purchase upon a following pair of the nut's diametrically opposite faces, the wedge shape of the block being such that the inner face thereof lies in approximate parallelism with the gripping face of the fixed jaw, and an upstanding lip presented at the inner end of the block's inner face and arranged in the working swing of the wrench to establish a shoulder purchase upon the nut.

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