SLIDING-JAW, LEVER AND RACK ACTUATED WRENCH

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2 Claims. (Cl. 81—86)

This invention relates to wrenches and it is an object of the invention to provide a wrench of this kind of a vise-grip type wherein is comprised a fixed jaw and a movable jaw traveling in substantially a straight path toward or from the movable jaw, and it is primarily an object of the invention to provide means whereby the opposed or working faces of the jaws maintain their same plane relation at all times throughout the range of relative adjustment of said jaws.

The invention also has for an object to provide a wrench of this kind including two relatively inmovable jaws and wherein the movement of one of said jaws toward the other is effected through the instrumentality of a rack and in a manner whereby the opposed or working faces of the jaws in all of their relative positions are in parallelism.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved wrench whereby certain important advantages are attained, as will be hereinafter more fully set forth.

In order that my invention may be better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a view in side elevation and partly in section of a wrench constructed in accordance with an embodiment of my invention.

Figure 2 is a fragmentary detail sectional view taken substantially on the line 2—2 of Figure 1:

Figure 3 is a sectional view taken transversely of the tool on a line through the slide bar; and

Figure 4 is a sectional view taken substantially on the line 4—4 of Figure 1.

As disclosed in the accompanying drawings, the main handle member H is of channel formation with the intermediate or rear wall 1 terminating a material distance rearwardly of the head or forward end of the handle member H.

The side walls 2 of the handle member H disposed beyond the intermediate or back wall 1 are transversely enlarged to provide the extended plates 3, the forward edges of which are straight and in parallelism.

The side walls 2 are forwardly extended, as at 4, and welded or otherwise rigidly held therebetween is an attaching web 5 carried by the rear face of a jaw 6 whereby said jaw 6 is fixed with respect to the handle member H. This web 5 has an inner face 7 which is straight and substantially flush with the straight edges of the extended plates 3.

The extended plates 3 have welded or other-wise rigidly carried by the inside faces thereof the opposed parallel track bars 8 also parallel with the forward straight edges of the extended plates 3. These track bars 8 extend entirely across the extended plates 3 and the adjacent portions of the side walls 2 of the handle member H.

Positioned between the extended plates 3 is a slide bar 9 having in its side faces the guide channels 10 extending from end to end and in which are substantially snugly received the track bars 8, whereby the slide bar 9 is mounted for rectilinear movement.

The forward longitudinal side of the slide bar 9 carries at one end an outstanding jaw 11, the inner or working face of which is substantially flat and parallel with the flat working face of the fixed jaw 6. The opposed or working faces of these jaws 6 and 11 are herein disclosed as substantially at right angles to the forward straight edges of the extended plates 3.

The rear longitudinal edge face of the slide bar 9 is provided therealong with the teeth 12, whereby slide bar 9 also constitutes a rack with which constantly meshes a segment gear 14.

This gear 14 is positioned between the forward extremities of the side walls 2 and the extended plates 3 of the handle member H and is held to the handle member H for rocking movement by the pivot member 15.

The gear 14 forwardly of its pivotal mounting is provided with the laterally extending arm 16 to which is operatively connected a tension spring 17 which is also operatively connected to the intermediate or rear wall 1 of the handle member H. This tension spring 17 provides means to constantly urge the slide bar 9 in a direction to maintain the jaw 11 of said bar at the limit of its movement away from the fixed jaw 6.

The outer end portion of the arm 16 has pivotally connected therewith, as at 18, an end portion of an operating handle or lever 19 and which, as herein disclosed, is also of channel formation. Pivotedly engaged between the side walls of this lever or operating handle 16 through the medium of a pin 20 is an end portion of a stub lever or fulcrum bar 21. This bar 21 is of desired length and extends rearwardly between the side walls of the handle member H at the rear portion thereof.

The end portion of the stub lever or fulcrum bar 21 extending between the side walls 2 of the handle member H is transversely enlarged to provide a cross-head 22 which has a width greater than the thickness of the bar.

The side walls of the handle member H at
said rear portion thereof and for a desired length are pressed together to provide a slot 23 of a width less than the length of the cross-head 22 to provide means to maintain the stub lever or fulcrum bar 21 in effective position during the use of the wrench or, in other words, to prevent the stub lever or fulcrum bar 21 from dropping away from the handle member H. The cross-head 22 has direct contact with the forward reduced pin extremity 24 extending axially from the forward end of a shank 25 threading through a sleeve 26 formed at the rear extremity of the handle member H.

It is believed to be obvious that the wrench as herein embodied is one wherein the opposed or working faces of the jaws 6 and 11 will at all times be parallel within the working range of adjustment of said jaws one with respect to the other, thus assuring the wrench having effective clamping action on the work therebetween and in a manner whereby is eliminated such jaws having an angular point of contact with the work.

The wrench as herein embodied is also one which assures the maintenance of the same pressure on the work at all times with a minimized liability of the jaws slipping from the work.

From the foregoing description it is thought to be obvious that a wrench constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated.

I claim:

1. A wrench comprising a handle member provided at one end portion with spaced side walls, a fixed jaw at said end portion of the handle member, opposed faces of said side walls being provided with guide tracks extending across behind said fixed jaw, a slide bar positioned between said walls and slidably engaging said guide tracks to move therealong, a gear rack on the slide bar, an outstanding jaw carried by said slide bar for coaction with the fixed jaw, a segment gear pivotally mounted between the side walls of the handle member and operatively engaging said gear rack for imparting endwise movement to the slide bar upon rocking of the segment gear, said segment gear pivot being on the longitudinal center of the handle member, means for normally maintaining the jaw of the slide bar at the limit of its movement away from the fixed jaw, an outstanding arm carried by the segment gear, an operating handle pivotally engaged with the outer end of said arm, and a stub lever pivotally engaged with the operating handle adjacent to the said end of the arm and pivotally coupled with the handle member, whereby swinging movement of the operating handle toward the handle member applies thrust to said arm to rock the segment gear in a direction to move the jaw of the slide bar toward the fixed jaw.

2. A wrench as set forth in claim 1 wherein the means for normally maintaining the jaw of the slide bar at its limit of movement away from the fixed jaw comprises a tension spring secured at one end to the arm of the segment gear between the gear pivot and the pivotal connection between the arm and the operating handle and secured at its other end to the handle member.  

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REFERENCES CITED

The following references are of record in the file of this patent:

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