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TOGGLE-CONTROLLED, SLIDABLE SIDE JAW WRENCH

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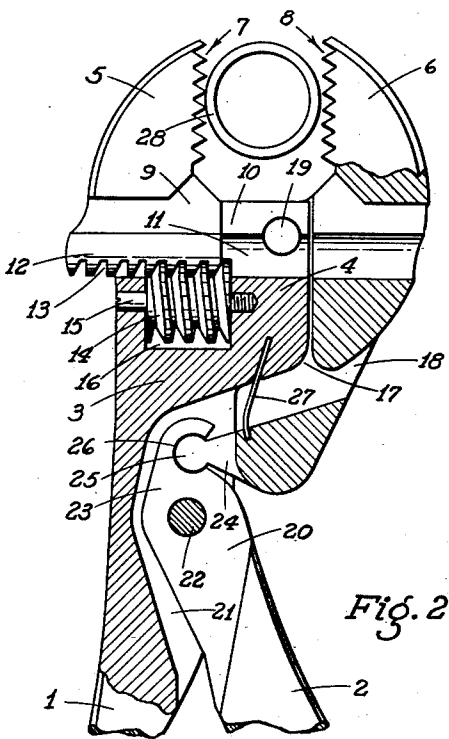


Fig. 2

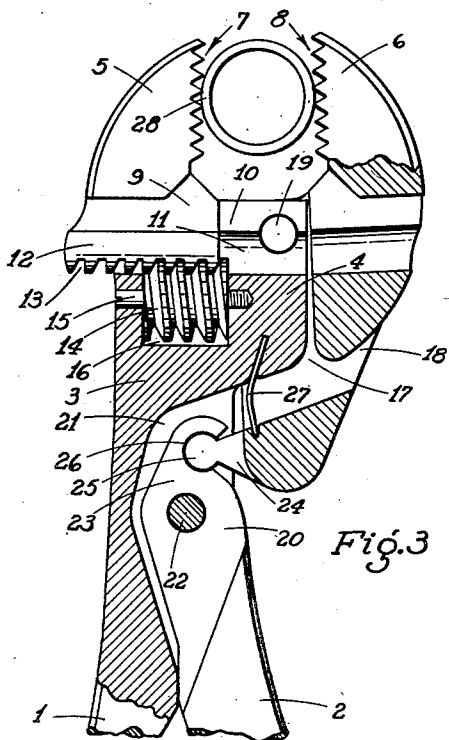


Fig. 3

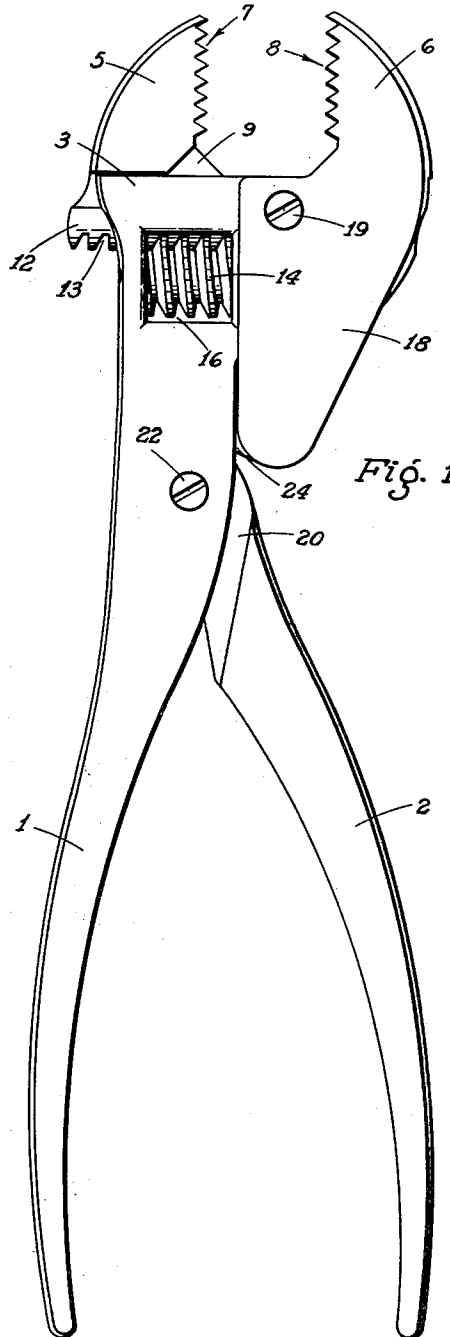


Fig. 1

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TOGGLE-CONTROLLED, SLIDABLE SIDE JAW
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2 Claims. (Cl. 81—84)

The present invention is directed to, and it is a major object to provide, improvements in hand wrenches.

In particular the invention relates to a pipe wrench of plier type; an important object of the invention being to provide such a wrench having novel characteristics with respect to its construction and function.

An additional object of the invention is to provide a plier-type hand wrench which, when in use, imparts a forceful, positive, and non-slipping bite or grip on the work, such as a pipe or similar member, which is engaged between the jaws of said wrench.

A further object of the instant invention is to provide a plier-type hand wrench wherein the cooperating serrated jaws are adjustable to and fro relative to each other, and are normally disposed in parallel relation for ease of engagement over the work, but when closed on the work approach each other closer at the tip than rearwardly thereof. The advantage of this latter function is to assure of such positive non-slipping bite or grip on the work.

A still further object of the invention is to provide a plier-type hand wrench which includes novel jaw actuating mechanism between the relatively swingable handle of the tool and the movable or pivoted jaw thereof.

It is also an object of the invention to provide a plier-type hand wrench which is designed for ease and economy of manufacture, as well as convenience of use.

An additional object of the invention is to provide a practical, reliable, and durable plier type hand wrench, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is a side elevation of the wrench showing the jaws in their normal parallel position before engagement with the work.

Fig. 2 is a fragmentary elevation, mainly in section, showing the working parts of the wrench as in Fig. 1, but with a pipe disposed between the jaws.

Fig. 3 is a similar view, but shows the swingable handle and pivoted jaw in the positions occupied thereby when the wrench is actuated and a pipe or other work is engaged between the jaws.

Referring now more particularly to the drawings, and to the characters of reference marked thereon, the wrench comprises an elongated, rearwardly extending fixed handle 1, and a similarly elongated and rearwardly extending swingable handle 2 disposed in opposition to said fixed handle 1.

At the forward end thereof the fixed handle 1 includes an integral head 3 having a laterally inwardly enlarged or projecting portion 4.

The front end of the head 3 is straight-cut at a right angle to the major longitudinal axis of the tool, and such head supports a normally fixed but adjustable, forwardly projecting jaw 5 and a pivoted or swinging, forwardly projecting jaw 6 disposed in normally transversely spaced cooperative relation; said jaws 5 and 6 including serrated working faces 7 and 8, respectively. The jaws 5 and 6 are constructed and mounted as follows:

The adjustable jaw 5 includes a rearwardly projecting, transverse flat guide web 9 which extends rearwardly through a transverse forwardly opening slot 10 in the head 3; such slot opening inwardly into a transverse bore 11 in said head.

At its inner end the guide web 9 is formed integrally

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with a slide bar 12 which runs in the transverse bore 11. Such slide bar 12 is adjustable in the bore 11 by means of a rack 13 cut in the rear face of said bar, with said rack engaged by a worm 14 journaled, as at 15, in a notch 16 in and opening from side to side of the head 4.

By finger engagement with the worm 14 the same can be rotated to cause the slide bar 12, web 9, and jaw 5 to adjust transversely of the tool, but with the serrated working face 7 always remaining parallel to the major longitudinal axis of the tool.

The jaw 6 is of substantially greater length than the jaw 5, extending rearwardly to a point back of the laterally inwardly enlarged or projecting portion 4 of the head 3; the jaw 6 having a laterally inwardly and forwardly opening cavity 17 formed therein. The laterally inwardly enlarged or projecting portion 4 of the head 3 extends into said cavity 17 with a relatively close but non-binding fit between the sides 18 of jaw 6.

Pivot screws 19 connect the sides 18 of jaw 6 to the head 3 adjacent the forward and inner corner of said portion.

In the initial or normal position of the pivoted jaw 6, its serrated working face 8 lies parallel to the major longitudinal axis of the tool; i. e., parallel to the working face 7 of jaw 5.

The pivoted jaw 6 is actuated from the swingable handle 2 in the following manner:

Said swingable handle 2 is formed, at its forward end, with a flat, forwardly projecting shank 20 which extends into a longitudinal channel 21 in the fixed handle 1 rearwardly of the head 3, and which channel opens laterally inwardly.

Within the channel 21 the flat shank 20 is pivoted, intermediate its ends, by a cross screw 22 to said fixed handle 1, so that the handles 1 and 2 are relatively swingable.

The portion of the shank 20 ahead of the pivot screw 22 provides a lever arm 23, and an integral finger 24 formed on the rear end of the pivoted jaw 6 projects laterally inwardly into the channel 21. At its inner end the finger 24 is swivelly coupled to the forward end of the lever arm 23 by a flat but ball and socket like connection comprised of a disc 25 on finger 24 turnably engaging in a socket 26 in the lever arm 23.

The cavity 17 has sufficient rearward extension that a substantial space exists between the rear end of the portion 4 of head 3, and the rear end of jaw 6; a longitudinal leaf spring 27 spanning between and being secured to the head portion 4 and said rear end of the jaw 6. The leaf spring 27 is disposed so that it yieldably urges the jaw 6 to its normal position, with the working face 8 parallel to the major longitudinal axis of the tool.

In use of the above described tool the jaw 5 is first adjusted by the worm 14 to set the spacing between the working faces 7 and 8 only slightly greater than the diameter of the work, such as a pipe 28, which is to be gripped by the wrench; the latter being then manipulated so that the work 28 lies directly between the working faces 7 and 8. Thereafter, the handles 1 and 2 are gripped and drawn together by one hand; the handle 2 swinging inwardly toward the handle 1. When this occurs the lever arm 23, through the ball and socket like connection, thrusts the finger 24 laterally outwardly, imparting corresponding motion to the rear end of the pivoted jaw 6. The jaw 6 then turns about the pivot screws 19, and the working face 8 swings inwardly, causing a forceful, positive, and non-slipping bite or grip of the working faces of the jaws on the work from opposite sides thereof.

When the pivoted jaw 6 swings inwardly from the initial or normal position of Fig. 2 to the work gripping position, as in Fig. 3, the serrated working face 8 of said jaw 6 approaches the serrated working face 7 of jaw 5 closer at the outer end of said face 8 than at the inner end thereof. In other words, the working face 8, when in engagement with the work 28, extends from its inner to its outer end at a slight forward and inward diagonal to the major longitudinal axis of the tool so that when said faces 7 and 8 are gripped with opposite sides of the work 28, the engagement—in addition to being forceful—is such that

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slippage of the wrench off of the work is prevented when the wrench is manipulated to rotate said work.

From the foregoing description it will be readily seen that there has been produced such a device as will substantially fulfill the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

1. A plier-type hand wrench comprising a relatively fixed handle having a head on its forward end, a relatively swingable handle, the latter having a flat shank at its forward end portion, a longitudinal, laterally inwardly opening channel in the fixed handle adjacent but to the rear of the head, the flat shank projecting into and extending along the channel, means pivoting the shank intermediate its ends in the channel and to said fixed handle, a normally fixed laterally inwardly facing jaw on and projecting forwardly from the head, a movable jaw member including a jaw disposed to cooperate with the fixed jaw, the head having a portion projecting laterally toward the movable jaw member and the latter having an inwardly opening cavity in which said projecting portion of the head is disposed, means pivoting the movable jaw intermediate its ends and at the sides to said projecting portion of the head for swinging motion of said movable jaw toward the fixed

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jaw, a finger rigid with and projecting laterally inwardly from the rear of the movable jaw member into said channel to a point adjacent the forward end of the shank, and a swivel connection in the channel between the adjacent ends of said finger and shank; the axis of said connection being substantially on a line drawn through the pivot means of the jaw and the movable handle when said handle is in a closed position.

2. A wrench, as in claim 1, in which the cavity extends rearward in the movable jaw a distance such that a space exists between the rear end of the laterally projecting portion of the head and the rear end of said movable jaw, and a leaf spring in the cavity secured to said ends and spanning therebetween; said spring acting in a direction to swing both the movable jaw and the movable handle to an open position.

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