April 17, 1928. 1,666,091

J. A. GILES

WRENCH

Filed July 12, 1926 2 Sheets-Sheet 1

Fig. 1.

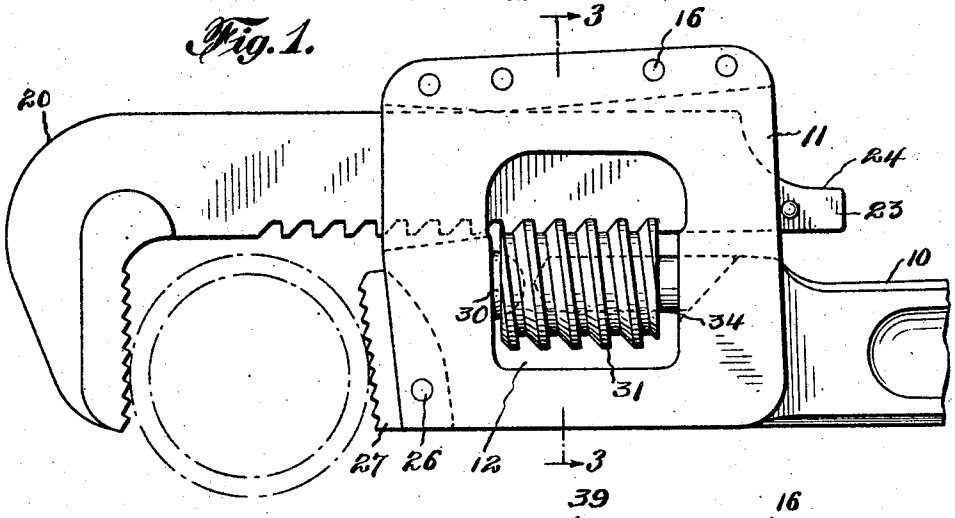


Fig. 2.

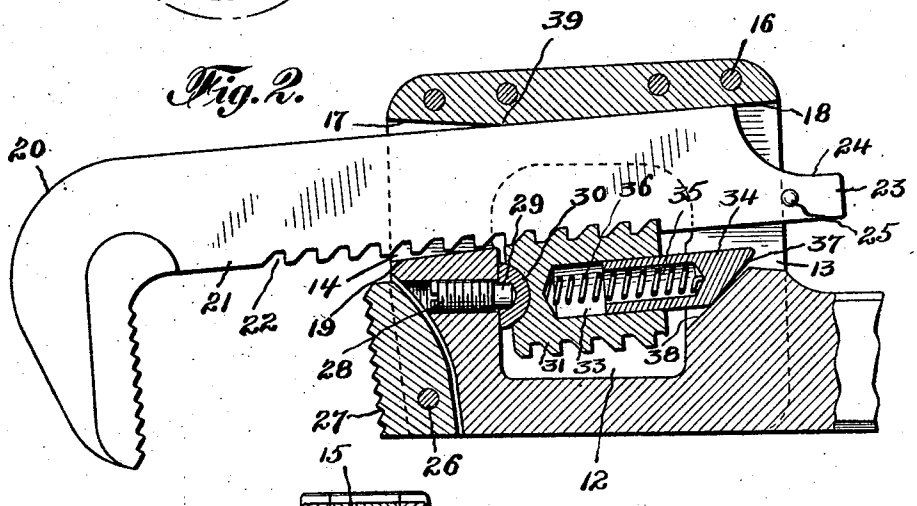
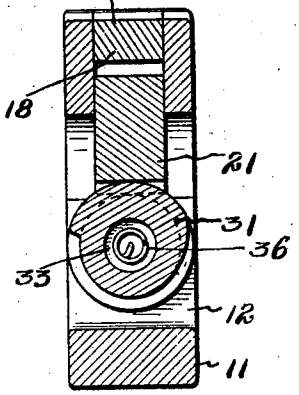


Fig. 3.



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Fig. 4.

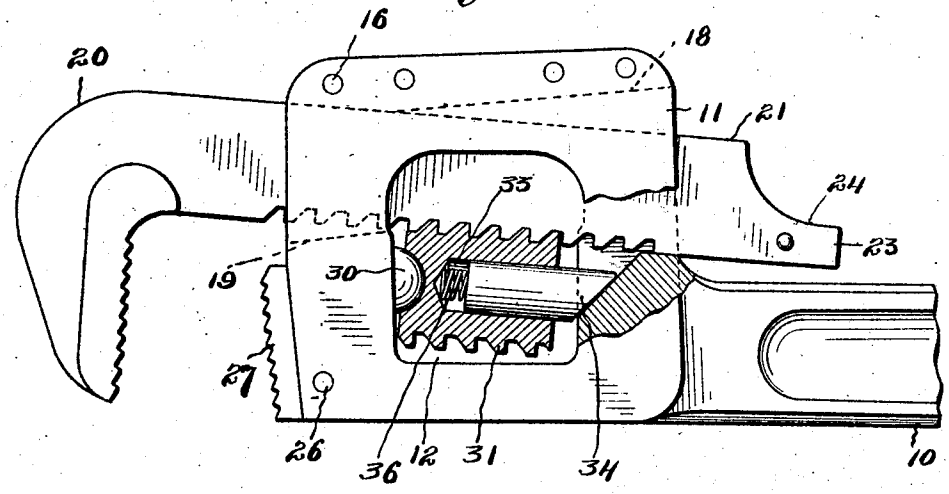
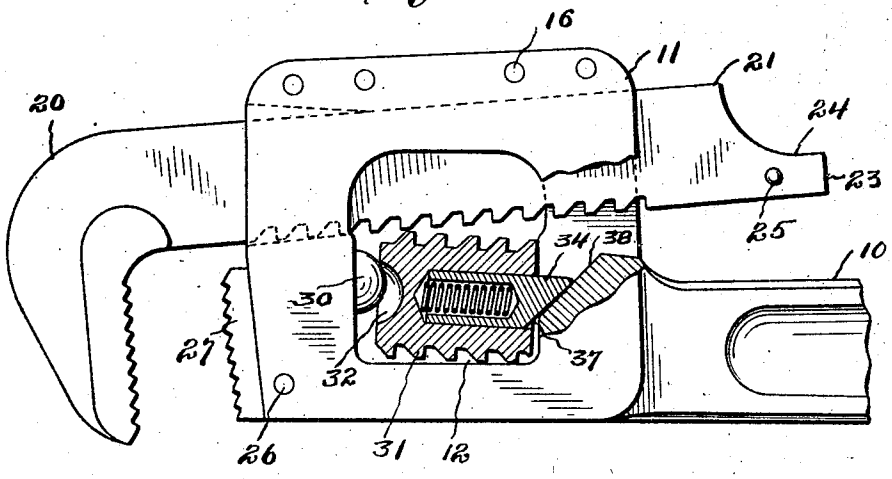


Fig. 5.



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Patented Apr. 17, 1928. 1,666,091

UNITED STATES PATENT OFFICE.

JULIAN A. GILES, OF DERBY, CONNECTICUT.

WRENCH.

Application filed July 12, 1926. Serial No. 121,898.

This invention relates to wrenches, having for its object, among other things, to provide a wrench wherein the movable jaw may be adjusted relatively to the fixed jaw with the greatest ease, either by the worm, or by pressure upon the end thereof, and to so support the worm that it will have the maximum range of movement.

To these, and other ends, my invention consists in the wrench, having certain details of construction and combinations of parts, as will be hereinafter described and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference designate like parts in the several figures;

Figure 1 is a view of the forward end of a wrench constructed in accordance with my invention, with the parts in the position occupied by them as the object is gripped between the jaws;

Figure 2 is a similar view with the movable jaw out of engagement with the said object;

Figure 3 is a transverse sectional view of the wrench, the parts in section being in the plane indicated generally by the line 3—3 of Figure 1;

Figure 4 is a view, partly in section, showing the movable jaw in another of its relative positions; and

Figure 5 is a view with the movable jaw is substantially the same relative position as is shown in Figure 2, with the worm moved out of its engagement therewith.

In the practice of my invention, I provide a wrench having a handle 10, upon one end of which is formed the head 11, having a transverse opening 12 and slots 13 and 14 extending through the walls thereof, the latter being at substantially a right angle to the former, and secured thereto, by the pin 26 or the like, is a fixed jaw 27. These slots are closed at one side by the member 15, preferably secured to the head 11 by the rivets 16 or the like. The inner wall of this member has two faces 17 and 18 at an angle to each other, and the lower wall 19 of the slot 14 is substantially but not necessarily parallel with the face 18.

Slidably mounted within the slots 13 and 14 is the movable jaw 20, the shank 21 of which terminates at one end in a tail portion 23, having a face 24, upon which the thumb or finger is placed when manually manipulating the jaw. A fixed pin 25 provides a stop to limit the outward movement of the jaw 20.

Threaded into an opening in the head 11 is a stud 28 upon the shank 29 of which is rotatably mounted the semi-spherical block 30.

Within the opening 12 is the worm 31, having a thread thereon which meshes into the teeth 22 of the movable jaw 20. This worm is provided at one end with a semi-spherical seat 32, into which projects the block 30, and within the axial opening 33 therein is a plug or movable member 34, having an opening 35 therein, between the bottom of which and the bottom of the opening 33 is the spring 36.

The outer end of the plug 34 is formed with a cam face 37, which is maintained in contact with the cam surface 38 upon the head 11 by the spring 36.

The worm 31 is rotatable about its axis upon the block 30 and plug or movable member 34 and also has an oscillating movement upon the block 30 against the tension of the spring 36, which will yield sufficiently to permit the worm to be moved to a position substantially parallel with its axis while oscillating upon the block 30, the worm and movable member being so mounted that each has an endwise movement upon a common axis. These several positions of the worm are illustrated in the drawings. In Figure 1, the worm is illustrated as being in engagement with the movable jaw; in Figures 2 and 4 the worm still maintains its engagement with the movable jaw but the latter is in another relative position; and in Figure 5 the worm has been moved to a position where the thread thereon is out of engagement with the teeth in the movable jaw. In this latter position the movable jaw will slide freely within the head 11 unrestrained by the worm. Immediately upon release of the pressure of the fingers upon the worm 31, after the same has been moved to the position shown in Figure 5, the spring 36 will return the worm to a position where the thread thereon will engage the teeth of the movable jaw assisted by the engagement of the cam faces 37 and 38.

With the parts as shown in Figures 1, 2, 3 and 4, the position of the movable jaw within the head toward the fixed jaw may be varied by pressure upon the outer end of

the jaw. Movement in the opposite direction is obtained by manual rotation of the worm 31. During this movement of the jaw within the head the worm 31 yields sufficiently upon its support by reason of the angular face on the thread upon the worm 31 and a similar angular face upon the teeth 22. The floating action of the worm permits of an easy and quick adjustment of the movable jaw, either with or without manual manipulation of the worm. For instance, when the head of the wrench is positioned where it is difficult to control the manual movement of the movable jaw, as in a corner or the like, a slight pressure applied to the end of the jaw by placing the same in contact with a fixed wall or the like, will push the movable jaw toward the fixed jaw. A reverse movement may be obtained by merely shifting the relative position of the worm and allowing the movable jaw to slide by gravity to its outermost position.

As there are no parts projecting outside of the walls of the head 11 this wrench may be operated in any space that will receive such head.

The edge face of the movable jaw opposite to the toothed edge in two of its extreme positions contacts with the faces 17 and 18 and forms a rigid and substantial support therefor. The junction point 39 of these two faces provides a convenient rocking surface for the movable jaw while shifting from one position to the other of its extreme positions.

While I have shown a simple and convenient means for providing a floating support for the worm within the head, other means may be utilized to accomplish the same purpose within the spirit of my invention.

While the drawings herein shown disclose the handle as substantially parallel with the head 11, my improved mechanism is equally as well adapted to any other type of wrench, for instance, wherein the handle is at an angle to the sliding jaw.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A wrench having a head; a fixed jaw; a movable jaw associated with the fixed jaw so as to have a rocking and lengthwise movement relatively thereto; a worm for imparting lengthwise movement to the movable jaw, having a separable toothed engagement therewith; and means for mounting the worm, whereby the same will maintain its engagement with the movable jaw while the same is rocked relatively to the fixed jaw and also movable into and out of its engagement with the movable jaw in a circular path, the center of which is adjacent to one end of the worm.

2. A wrench having a head; a fixed jaw; a movable jaw associated with the fixed jaw so as to have a rocking and lengthwise movement relatively thereto; a worm for imparting lengthwise movement to the movable jaw, having a separable toothed engagement therewith; and means, including an independent member, for mounting the worm, whereby the same will maintain its engagement with the movable jaw while the same is rocked relatively to the fixed jaw and also movable into and out of its engagement with the movable jaw in a circular path, the center of which is adjacent to one end of the worm, the independent member during this movement supporting one end of the worm.

3. A wrench having a head with a cam face thereon, a fixed jaw, a movable jaw, a worm mounted in the head, and a member forming in part a support for the worm, having contact with the said cam face, and by reason thereof movable in one direction substantially parallel with the axis of the worm.

4. A wrench having a head with a cam face thereon, a fixed jaw, a movable jaw, a worm mounted in the head, a member forming in part a support for the worm, having contact with the said cam face, and by reason thereof movable in one direction substantially parallel with the axis of the worm, and yielding means for moving the member in the reverse direction.

5. A wrench having a head with a cam face thereon, a fixed jaw, a movable jaw associated with the fixed jaw so as to have a rocking and lengthwise movement relatively thereto, a worm mounted in the head and having a separable toothed engagement with the movable jaw during its movement, and having an opening therein, a member slidably mounted within the opening having engagement with the cam face and whereby it acquires movement in one direction substantially parallel with its axis, and a spring exerting its tension so as to move the member in the reverse direction.

6. A wrench having a head, a fixed jaw, a movable jaw, associated with the fixed jaw having a rocking and lengthwise movement relatively thereto, a semi-spherical member adjacent to the fixed jaw, a worm journaled on said semi-spherical member and movable in a circular path during the movement of the movable jaw, the center of which is the semi-spherical member, and a member movable toward and away from the semi-spherical member and forming a support for the worm, adjacent to one end thereof.

7. A wrench having a head, a fixed jaw connected therewith, a worm, a movable member forming a support for the worm, and means for actuating said member whereby it may impart to the worm an oscillating movement relatively to the head the worm and movable member being so mounted that

each has an endwise movement upon a common axis.

8. A wrench having a head, a fixed jaw connected therewith, a worm, a movable member forming a support for the worm, and cam means for actuating said member whereby it may impart an oscillating movement to the worm relatively to the head the worm and movable member being so mounted that each has an endwise movement upon a common axis.

9. A wrench having a head, a fixed jaw connected therewith, a worm, a movable member forming a support for the worm, and means, including a spring, for actuating said member whereby it may impart to the worm an oscillating movement relatively to the head the worm and movable member being so mounted that each has an endwise movement upon a common axis.

10. A wrench having a head, a fixed jaw connected therewith, a worm, a movable member forming a support for the worm, and means, including a cam and spring, for actuating said member whereby it may impart to the worm an oscillating movement relatively to the head the worm and movable member being so mounted that each has an endwise movement upon a common axis.

11. A wrench having a head; a fixed jaw; a movable jaw associated with the fixed jaw so as to have a rocking and lengthwise movement relatively thereto; a worm for imparting lengthwise movement to the movable jaw, having a separable toothed engagement therewith, and means which operate automatically to move the worm toward the movable jaw and into engagement therewith from any position in which the worm may be placed and irrespective of the position of the movable jaw relative to the head.

12. A wrench having a head; a fixed jaw; a movable jaw associated with the fixed jaw so as to have a rocking and lengthwise movement relatively thereto; a worm for imparting lengthwise movement to the movable jaw, having a separable toothed engagement therewith; and means, including in part an independent member, for mounting the worm, whereby the same will maintain its engagement with the movable jaw while the same is rocked relatively to the fixed jaw and also movable in a circular path into and out of engagement with the movable jaw, the center of such path being adjacent to one end of the worm, and the independent member during this movement supporting one end of the worm and having a lengthwise movement relative to the worm.

13. A wrench having a head portion with an opening therethrough; a fixed jaw connected therewith; a movable jaw associated with the head so as to have a rocking and lengthwise movement relative thereto; a worm for imparting lengthwise movement to the movable jaw, having a separable toothed engagement therewith; and means for mounting the worm within the opening, whereby the same may be moved in a substantially straight path toward and away from opposite walls of the opening and a circular path, the center of which is adjacent to one of said walls.

In testimony whereof, I have hereunto affixed my signature.

JULIAN A. GILES.