

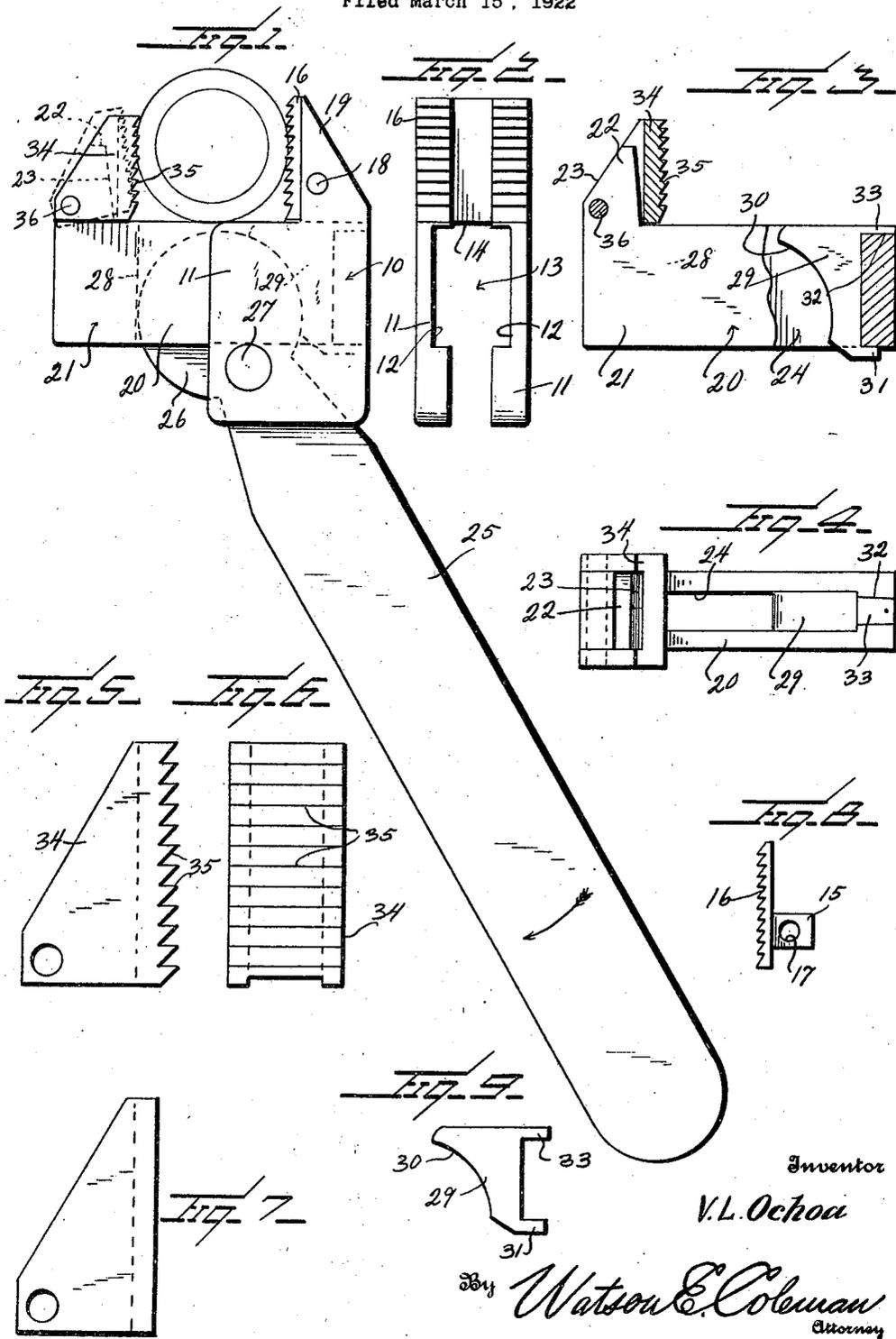
May 8, 1923.

1,454,333

V. L. OCHOA

WRENCH

Filed March 15, 1922



Inventor

V. L. Ochoa

By *Watson E. Coleman*
Attorney

UNITED STATES PATENT OFFICE.

VICTOR L. OCHOA, OF EL PASO, TEXAS, ASSIGNOR TO OCHOA TOOLS AND MACHINE COMPANY, A CORPORATION OF DELAWARE.

WRENCH.

Application filed March 15, 1922. Serial No. 543,939.

To all whom it may concern:

Be it known that I, VICTOR L. OCHOA, a citizen of the United States, residing at El Paso, in the county of El Paso and State of Texas, have invented certain new and useful Improvements in Wrenches, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to wrenches for turning pipe, nuts or other like objects, and particularly to certain improvements upon the wrench disclosed in my Patent #1,417,196, granted May 23, 1922.

In the wrench which forms the subject matter of the aforesaid patent, there are jaws movable rectilinearly toward each other by a lever having a cam-shaped head. The lever is oscillatable in order to relatively shift the jaws and the periphery of the cam-shaped head operates between what may be termed the fixed and the movable jaws.

One of the objects of the present invention is to provide means for preventing the flattening of the peripheral edge of this circular head after the wrench has been used some little time, and more specifically to provide a detachable wear piece on the shank of the movable jaw against which the periphery of the head bears and by which the wear is taken up, and to provide means whereby this wear piece may be readily inserted in place or removed.

A further object is to provide a wrench of the character stated which is easily convertible into a pipe wrench and to provide a jaw piece on the movable jaw which is mounted for a slight tilting or wedging movement so that on the operating stroke of the wrench, as for instance in unscrewing a pipe or screwing it into position, the jaw will bite into the pipe, and upon the opposite movement or recession movement, the jaw piece will move into such position as to give the teeth an extra nip on the work.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of a wrench constructed in accordance with my invention:

Figure 2 is a front view of what may be termed the fixed jaw:

Figure 3 is a side elevation of the movable jaw, the end of the shank 20 being in

section and the jaw piece 34 being in section: 55

Figure 4 is a top plan view of the movable jaw:

Figure 5 is an enlarged side elevation of the pivoted jaw piece:

Figure 6 is a front elevation thereof: 60

Figure 7 is a side elevation of a toothless pivoted jaw piece:

Figure 8 is a side elevation of the removable jaw piece for the fixed jaw:

Figure 9 is a side elevation of the key or wear piece 29. 65

Referring to these drawings, it will be seen that the wrench comprises a bifurcated fixed jaw, designated generally 10, and having the spaced cheek plates 11, the inner faces of these cheek plates being recessed, as at 12, (see Figure 2). A space 13 between the cheek plates 11 has its upper wall longitudinally grooved, as at 14. The jaw is angular in side elevation and the upper end of the jaw 11 is formed with a recess for the reception of the shank 15 of a ratchet toothed plate 16. The shank is perforated at 17 (see Figure 8) and the jaw is perforated for the passage of a pin 18 whereby this toothed plate 16 may be held in place. As illustrated, this toothed plate has downwardly extending ratchet teeth and the inner face of the plate abuts firmly against the upwardly extending portions 19 of the jaw 10. 75

The teeth on the toothed plate 16 are arranged in two rows, as illustrated in Figure 2, spaced from each other by an intermediate untoothed portion. Operating through the guideway 13 is the shank 20 of a movable jaw 21 having an upwardly projecting stub 22 whose face confronting the jaw 10 is downwardly and outwardly inclined, as at 23. This stub is narrower than the shank of the jaw. The shank 20 is formed with a longitudinally extending slot 24, as illustrated in Figure 4, and pivoted to the lower inner corner of the cheek pieces 11 is a lever 25 whose upper end is formed with a circular head 26. It will be seen that the pivot 27 for this lever is disposed as close to the path of movement of the shank 20 as is possible and that the circular head always bears against the wall 28 of slot 24. 80 85 90 95 100 105

The slot 24 is longer than the diameter of the head 26 but this difference is compen-

sated for by a key or wear piece 29, illustrated in Figure 9, which is inserted and held in place within the end of the slot 24. This wear piece has a concavely curved inner edge surface 30 having substantially the same curvature as the curvature of the head 26 and at all times bearing against this head. The outer edge face of this wear piece opposite the curved face 30 extends at right angles to the line of movement of the movable jaw and at its lower end is formed with an outwardly projecting locking lug 31. The upper face of the rear wall of the slot 24 of shank 20 is grooved, as at 32, and the upper end of the wear piece is formed with a lug 33 adapted to engage in this groove. Thus when the lever is in place the wear piece 29 cannot move either upward or downward, nor can it move outward and away from its seat, but at all times is held in more or less loose engagement with the peripheral face of the head 26. The slight play which is present in this wear piece 29 tends to distribute wear upon the head 26 and thus prevents this head 26 being flattened or worn away upon that face which bears operatively against the movable jaw to cause the jaws to move toward each other. Of course, there is no particular wear upon the head 26 when the jaws are forced apart, at least the wear is very slight. The wear upon the peripheral face of the circular head when the jaws are forced together, however, is relatively great because this circular face acts as a true cam and has a wedging effect upon the movable jaw, as fully explained in my patent before referred to.

Mounted upon the stub 22 for limited pivoted movement is the jaw piece 34 illustrated in detail in Figures 5 and 6. This jaw piece is U-shaped in cross section and the face of the jaw piece is formed with a plurality of upwardly extending ratchet teeth 35 which are medially disposed with relation to the teeth of the jaw piece 16 and which, as shown, extend entirely across the jaw piece 34. The jaw piece is provided with the two lateral wings which embrace the stub 22 and are pivoted thereto at the lower outer corner of the pivot pin 36. The stop 22 has its inner edge face upwardly and outwardly inclined so as to permit the pivoted jaw piece 34 to tilt from and to the position shown in dotted lines in Figure 1. This is a very important part of the wrench, for the reason that it is this pivoted jaw piece which secures the final bite upon the pipe or other object being operated on.

While I have illustrated in Figures 5 and 6 a pivoted jaw piece which is toothed, in Figure 7 I illustrate the same jaw piece without teeth. It will be noted that the jaw 10 extends above the jaw 21 slightly so that by pressing the relatively long jaw against

a nut or other object, the jaws may be readily forced away from each other by movement of the handle or lever 25. Assuming that this device is to be used as a pipe wrench, the jaws will first be expanded so as to embrace the pipe and slipped over the pipe, then the lever will be moved in the direction of the arrow in Figure 1 and this movement will act to cause the slightly eccentrically pivoted head 26 to act as a cam against the curved concave face of the wear piece 29, which is part of the jaw 21, and will cause this jaw to be shifted toward the jaw 10 and to grip the pipe between the ratchet toothed jaw faces. Upon a reverse movement of the handle 25, the jaws will be moved apart or released, and thus it is obvious that a pipe, nut or other article may be turned as if by a ratchet wrench, the wrench not having to be released from the work and reapplied between each step, a mere oscillation of the handle being sufficient to accomplish this work. Upon a movement of the handle 25 in a direction reverse to the arrow in Figure 1, the pivoted jaw piece 34 will tilt upward and outward or to the dotted line position in Figure 1, but upon a reverse movement given to the handle 25 it gives a movement in the direction of the arrow which will act to force the jaws toward each other. The pivoted jaw piece 34 will first swing to the position shown in dotted lines in Figure 1, or into divergent relation to the jaw 16, and then the pivoted jaw piece will have an additional downward movement which will exert a wedging action on the jaw piece, causing the teeth to bite into the pipe and give this final bite of the wrench upon the pipe, which will practically lock the wrench to the pipe for a working stroke. Upon a reverse movement, however, the pivoted jaw piece moving reversely will free the pipe entirely from the wrench. It will thus be seen that the movable jaw moves outward upon the recessional stroke and moves inward upon the working stroke just enough to give the teeth an extra nip on the pipe and to make sure of biting into the pipe. This wrench will not jam, however, at any time.

The Stillson wrenches and Tremo wrenches now on the market are hard to cause to bite into the pipe and it is still harder to afterwards release the jaws. The pivoted jaw piece, on the other hand, with my device, releases automatically on the recessional stroke whenever a new hitch is necessary.

It will be noted that one jaw is made with two parallel rows of teeth and the other jaw with a single row. This obviates a common fault in pipe wrenches that the teeth wear at the edges, leaving the teeth higher at the center than at the edges. This makes the old wrenches wobble to one side when placed

on a pipe and often causes the breakage of the handle or lever of the wrench. With my construction the wrench cannot slip side-wise and the pipe is kept in alignment.

5 I claim:—

1. In a wrench, a handle having a circular head, a jaw pivoted to the head and having a slot and a guideway, a second jaw having a shank extending through the guideway and
10 movable therein and having a slot closed at opposite ends and in which the circular head operates, and a removable wear piece disposed in one end of the slot and bearing against the adjacent end wall thereof and
15 against which the circular head bears.

2. In a wrench, a handle having a circular head, a jaw pivoted to the head and having a slot and a guideway, a second jaw having a shank extending through the guideway and
20 movable therein and having a slot in which the circular head operates, and a removable wear piece disposed in one end of the slot and against which the circular head bears, the wear piece having lugs embracing the
25 outer end wall of the slot and holding the wear piece in place.

3. A wrench comprising a pair of jaws movable with relation to each other, one of said jaws having a shank slidably engaged
30 with the other jaw and formed to provide a laterally projecting pair of abutments, a handle formed with a circular head having a diameter nearly equal to the space between the abutments and at all times bearing

against one of said abutments, the handle
35 being pivoted to one jaw closely adjacent the other jaw and the periphery of the head operating as a cam against the abutments on said shank, and a wear piece disposed
40 between one of said abutments and the head and having lugs embracing the abutment, the inner edge face of the wear piece being curved to conform substantially to the curvature of the head.

4. A wrench comprising a pair of jaws
45 movable with relation to each other, one of said jaws having a shank slidably engaged with the other jaw and formed to provide a laterally projecting pair of abutments, a handle formed with a circular head disposed
50 between the abutments, the handle being pivoted to one jaw adjacent the other jaw and the periphery of the head operating as a cam against said abutments on said shank to relatively shift the jaws, the jaw to which
55 the handle is pivoted having a jaw face disposed at right angles to the path of movement of the shiftable jaw, the shiftable jaw having an upwardly extending stub, and a jaw piece pivoted to said stub and confronting
60 the first named jaw face and having limited oscillation from a position parallel to the first named jaw face to a position divergent with relation thereto.

In testimony whereof I hereunto affix my
65 signature.

VICTOR L. OCHOA.