Aug. 12, 1924. 1,504,870

J. P. COUGHLIN

WRENCH

Filed June 27, 1923

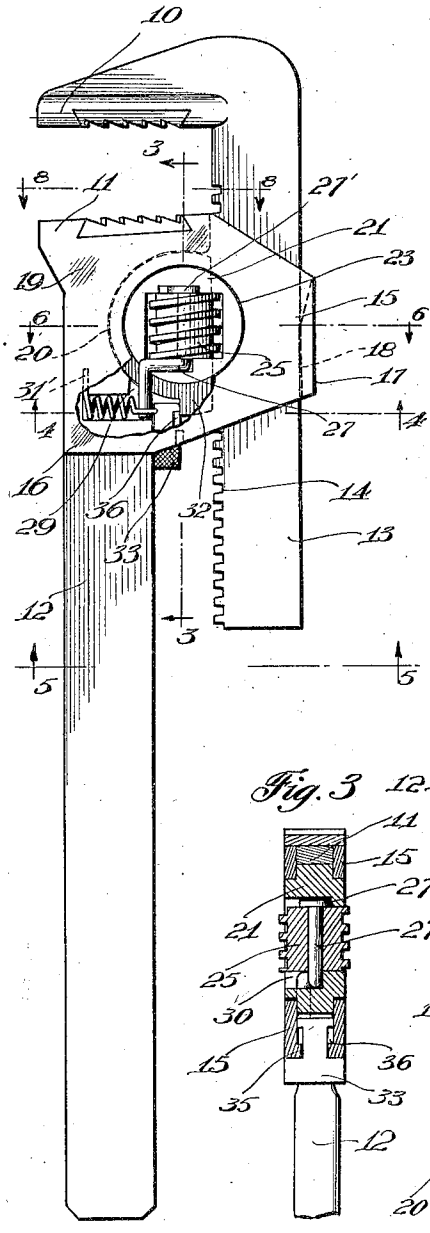


Fig. 1

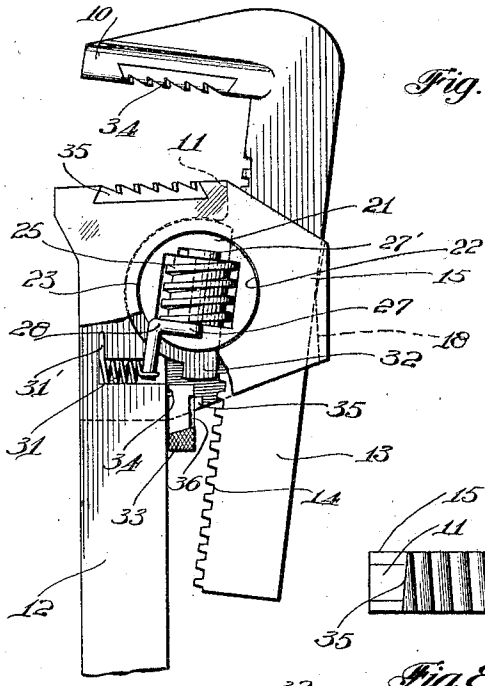


Fig. 2



Fig. 8

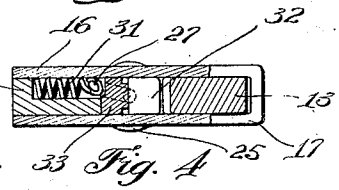


Fig. 4



Fig. 3

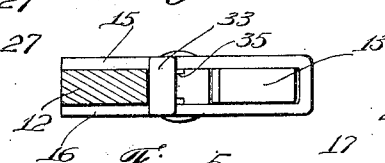


Fig. 5

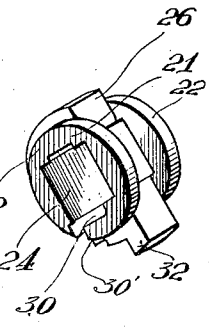


Fig. 7

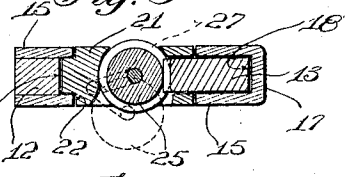


Fig. 6

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# UNITED STATES PATENT OFFICE.

JOHN P. COUGHLIN, OF CHICAGO, ILLINOIS.

## WRENCH.

Application filed June 27, 1923. Serial No. 648,011.

*To all whom it may concern:*

Be it known that I, JOHN P. COUGHLIN, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Wrenches, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to wrenches, and more especially, as regards several of its features, to the "Stillson" wrench. One object of my invention is to provide a combination wrench which may quickly be altered for use as a monkey wrench or a Stillson wrench at the will of the user. Another object of my invention is to provide an improved means for rotating the movable jaw shank of a Stillson wrench. A still further purpose of the invention is a quick adjusting means whereby the gross adjustment of the jaws may be made without the time usually taken to turn the nut or worm. Still another object of the invention is the provision of inserted teeth in the jaws of the wrench, these inserted teeth being of such a form that, in use, they tend to seat themselves more firmly to the jaws. A more general object of my invention is the provision of a wrench embodying some or all of the above features, which is simple in construction, cheap to manufacture, reliable in operation and extremely easy to manipulate. Still further features and advantages of my invention will be seen from the following description, wherein a specific embodiment thereof is described, by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the wrench locked for use as a monkey wrench, a portion of the U-shaped plate being broken away to reveal the internal structure;

Figure 2 is a similar view showing the wrench unlocked and tilted for use as a Stillson wrench;

Figure 3 is a longitudinal section taken on the line 3—3 of Figure 1;

Figure 4 is a transverse section taken on the line 4—4 of Figure 1;

Figure 5 is a similar section taken on the line 5—5 of Figure 1;

Figure 6 is a similar view taken on the line 6—6 of Figure 1;

Figure 7 is a perspective view of the worm casing; and

Figure 8 is a face view of the stationary jaw of the wrench taken on the line 8—8 of Figure 1.

All of the sectional views are taken looking in the direction of the small arrows and similar characters of reference refer to similar parts throughout the views.

The wrench comprises an upper or movable jaw 10 and a lower or stationary jaw 11, the stationary jaw having a shank 12 projecting therefrom to form the wrench handle, while the movable jaw is provided with a shank 13 which extends parallel to, but spaced from, the shank 12, the edge adjacent thereto being racked with teeth 14.

A metal plate 15 is bent into a narrow U with its spaced legs 16 tightly fitting over the jaw 11 and its web 17 spaced from the right edge of the jaw to form a tunnel 18 in which is reciprocably mounted the shank 13 of the movable jaw. This U strap 15 may be spot welded, as indicated at 19, or otherwise suitably secured, as by rivets, to the jaw 11 and its integral shank. It will be noted that the right-hand edge of the jaw 11 is arcuately cut away, as indicated at 20, to provide for a circular worm casing 21 held between the legs of the U strap. The worm casing 21 is outwardly shouldered at each side to provide bosses 22—22, which project into circular openings 23 struck through either side of the U strap. These bosses 22 project outwardly just far enough to come flush with the outer surface of the strap 15.

The circular worm casing 21 is provided with a transverse hole 24 of rectangular perimeter, within which is disposed a worm 25 which normally engages the rack teeth 14. A segment is milled away from the right-hand side of the worm casing 21, as indicated at 26, between the boss 22 to make room for and to allow the reciprocation of the movable shank 13. The worm 25 is provided with a longitudinal bore by means of which it is rotatably mounted upon one end of a small crank 27 and there secured by a head 27′. The crank 27 is offset at 28 to enter a depression 29 cut in the upper right-hand edge of the stationary shank 12. The lower end (Fig. 1) of the crank 27 is journaled in this depression 29 between the shank 12 and the inner surface of the upper leg of the U strap 15.

The circular worm casing 21 is cut away at 30 and 30′ to provide for the reception

and the movement of the crank 27. The upper portion of the crank 27, upon which is carried the adjusting worm 25, is thus the free end of the crank and the worm can be revolved about the journal 29 as an axis, in addition to its usual rotary movement. It is contemplated that a user, by pressing his forefinger against the back side (Fig. 1) of the worm, may revolve the worm about the stationary shank of the crank so that the worm will clear the rack teeth 14, as shown in Fig. 6, whereby a gross adjustment of the jaws may be made without the necessity of rotating the worm.

In order to normally urge the worm back to its rack-engaging position within the worm housing, I shape the cross section of the extreme lower end of the journal shank of the crank in the form of a considerably elongated ellipse, as shown in Fig. 4. A tension spring 31 housed within the recess in the top side of the shank 12 and anchored at its inner end, as indicated at 31′, is attached at its free end to the elliptical end of the crank 27 and because of the obliquely disposed axis of this ellipse serves normally to urge the free end of the crank carrying the worm into its position within the worm housing, where it will engage the rack teeth. It is only by a positive lateral push from the back side that the worm can be swung out of engagement.

At the lower portion of its enlarged periphery the worm casing 21 is provided with a protrusion 32, which, when the jaws are parallel, as in Fig. 1, is parallel to, but spaced from, the right-hand edge of the shank 12. A T-shaped lock member 33 is placed with its leg disposed between the legs of the U strap 15 and extending upwardly to underlie the protrusion 32 to prevent the worm casing and the movable shank 13 from rotating with reference to the stationary shank 12. The T lock is locked in this position by a corner grooved as at 34, to snap over the hooked end of the spring 31 which embraces the lower end of the crank 27. The head of the T member 33 normally juxtaposes the lower edges of the U strap 15 and is knurled at its ends to facilitate grasping by the thumb and forefinger, whereby the lock may be pulled downwardly, as shown in Fig. 2, to clear the protrusion 32 which allows the movable jaw to be tilted when the device is to be used as a Stillson wrench. The lock member 33 is held in place by means of internally projecting lugs 35 adjacent the lower edges of the U strap 15. These lugs cooperate with slots 36 in the adjacent corners of the leg of the lock.

It is to be seen that the several parts of the wrench, in its manufacture, are assembled in their proper position after which the U strap 15 is positioned and welded. This locks the journal end of the crank 27, the spring 31, the lock 33 and the worm housing 21 in place, so that they can not subsequently come loose or be lost.

When the wrench is used as a Stillson wrench, it is, of course, desirable that the teeth in the jaw be of a harder steel than the steel used for the shanks of the jaws, and for this reason I prefer to form the teeth on plates which are inserted in the jaws. In order to do this and at the same time insure that the inserted teeth will not work loose, (although they may readily be removed for replacement), I provide the ends of the inserted strips 34 with tapered dovetails to cooperate with similar dovetails in the jaws. From an inspection of Fig. 8 and as also indicated in Fig. 1, it will be seen that the teeth are not cut exactly transversely to the jaws, but have an obliqueness of a few degrees of such direction that the forceful biting by the teeth will tend to drive the dovetailed inserts further into the tapered opening 35 in the jaws.

Having thus described my invention, what I claim is new and desire to secure by Letters Patent of the United States is:

1. A wrench comprising a stationary jaw having a shank forming the wrench handle, a movable jaw having a toothed shank and being pivoted on said stationary shank, a rotary worm for engaging said toothed shank, a case for said worm rotatable with said movable jaw, and a crank journaled in said stationary jaw and rotating with said case, and carrying at its offset portion said worm, whereby said worm swings about said journal as an axis to engage and disengage said teeth.

2. A wrench comprising a stationary jaw, a movable jaw having a toothed portion and being pivotally mounted on said stationary jaw, a rotary worm for engaging said toothed portion to reciprocate said movable jaw, a case for said worm rotatable with said movable jaw for preventing longitudinal movement of said worm, a crank journaled in said stationary jaw but movable with said movable jaw and carrying said worm at its offset portion whereby said worm swings about said journal as an axis to engage and disengage said teeth, and spring means for swinging said worm into engagement with said teeth.

3. A wrench comprising a stationary jaw having a shank forming the wrench handle, a movable jaw having a toothed shank and being pivoted on said stationary shank, a rotary worm for engaging said toothed shank, a circular case for said worm, said case being rotatable with said movable jaw, a crank journaled in said stationary jaw and rotating with said case, and carrying at its offset portion said worm, whereby said worm swings about said journal as an axis to en-

gage and disengage said teeth, and a spring between the journaled end of said shank and said stationary shank, said end being deformed at the point of application of the spring to provide leverage for the spring about the axis of said journal whereby said worm is normally urged into engagement with said shank teeth.

4. A wrench comprising a stationary jaw having a shank forming the wrench handle, a movable jaw having a toothed shank and being pivoted on said stationary shank, a rotary worm for engaging said toothed shank, a circular case for said worm, said case being rotatable with said movable jaw, a crank journaled in said stationary jaw and rotating with said case, and carrying at its offset portion said worm, whereby said worm swings about said journal as an axis to engage and disengage said teeth, and an open sided pocket in said stationary jaw, a spring disposed in said pocket and connected to said crank for normally holding said worm in engagement with said shank teeth, and a plate covering one side of said stationary shank and closing said pocket, said plate having an offset portion providing a tunnel in which reciprocates said movable shank.

5. A wrench comprising a stationary jaw having a shank forming a wrench handle, a movable jaw having a toothed shank and being pivoted on said stationary jaw, a rotary threaded member for engaging said toothed shank adjustably to space said jaws, a case for said member rotatable with said movable jaw, and forming a pivot for said jaw, a stop shoulder on said case, a lock disposed adjacent one of said shanks and reciprocable longitudinally thereof to engage and disengage said shoulder whereby said movable jaw is locked and unlocked.

6. A wrench comprising a stationary jaw having a shank forming the wrench handle, a movable jaw having a toothed shank and being pivoted on said stationary jaw, a rotary threaded member for engaging said toothed shank adjustably to space said jaws, a case for said member, a U-shaped strap between the legs of which is secured said stationary jaw, the web or said U and the adjacent legs thereof forming a sleeve in which reciprocates said movable shank, a circular opening in said strap, a trunnion on said case rotatable in said opening to pivot said movable jaw, and releasable means to lock said jaw against rotation.

7. A Stillson wrench comprising in combination therewith a jaw member and a removable plate having spaced teeth therein, said plate having a dovetail fit in said jaw member tapering toward one edge thereof, said teeth being inclined, relatively to the center line of said jaw, forwardly of the jaw in the converging direction of said taper for urging said plate into its tapered dovetail fit when the wrench is in use.

In witness whereof, I hereunto subscribe my name this 18 day of June, 1923.

JOHN P. COUGHLIN.

Witnesses:

DAGMAR PETERSON,

EMILE J. BOURGEOIS.