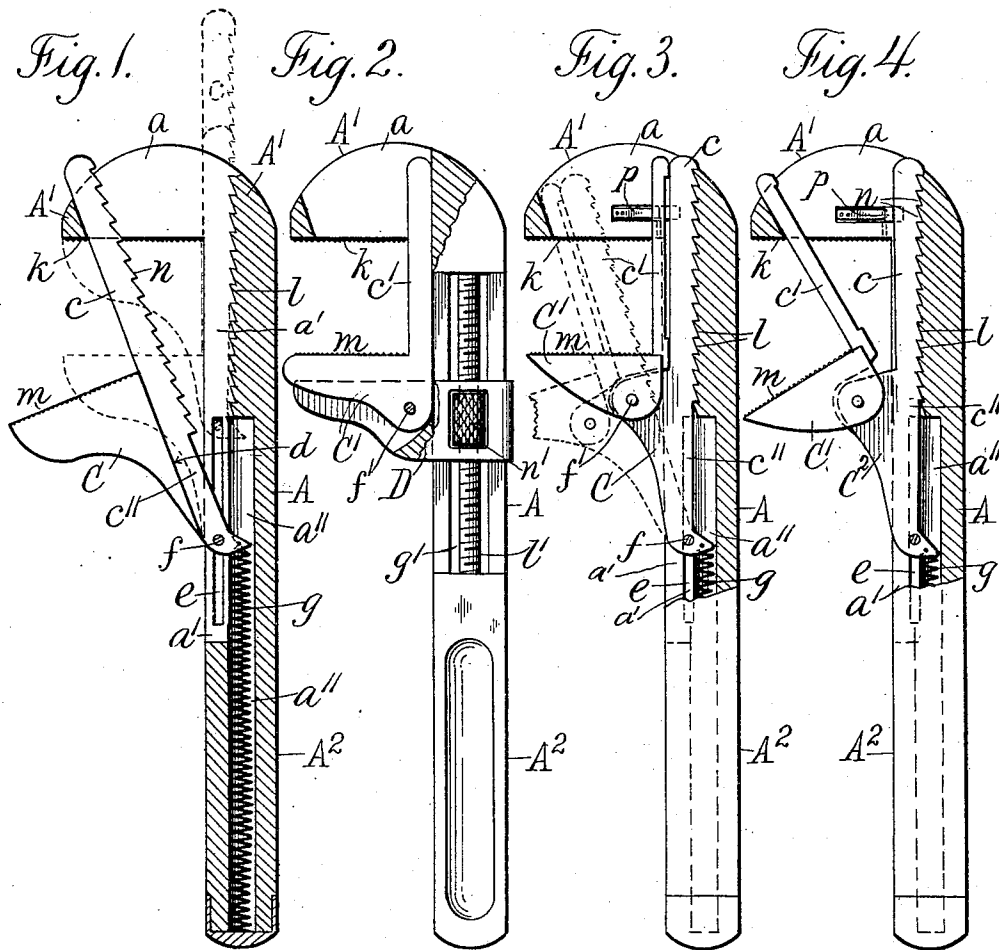


T. H. THORNE.  
WRENCH.

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968,816.

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Inventor

Thomas H. Thorne

By

E. B. Clark

Attorney

Witnesses  
W. E. Allen  
H. B. Corneley

# UNITED STATES PATENT OFFICE.

THOMAS H. THORNE, OF VANCOUVER, BRITISH COLUMBIA, CANADA.

## WRENCH.

968,816.

Specification of Letters Patent. Patented Aug. 30, 1910.

Application filed September 17, 1909. Serial No. 518,289.

*To all whom it may concern:*

Be it known that I, THOMAS H. THORNE, a subject of the Kingdom of Great Britain, residing at Vancouver, in the county of Vancouver and Province of British Columbia, Canada, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to wrenches adapted for turning a nut or pipe.

The object of my invention is to provide a wrench of simple construction and of easy and convenient manipulation, having a self adjusting lower jaw, so constructed that it may have a ratchet movement on a nut or pipe, and may be oscillated and caused to grip or take a fresh bite on the same without removal therefrom till the part is screwed to its seat.

The details of construction of my improved wrench are shown in the accompanying drawings, in which:

Figure 1 represents a longitudinal section of an effective construction of my wrench. Fig. 2 represents a sectional elevation of a wrench with an ordinary movable jaw having a swinging jaw pivoted thereto. Figs. 3 and 4 represent sectional elevations of a wrench showing my self adjusting jaw with the swinging jaw pivoted thereto and in different positions.

Referring now to Fig. 1, the wrench is made with a shank A, having at its outer end a fixed jaw A<sup>1</sup>, and at its other end a handle A<sup>2</sup>. The fixed jaw A<sup>1</sup> is substantially at right angles to the shank and has a longitudinal slot *a* extending from a point near its outer end down into the shank, so as to register with a longitudinal groove *a'*, therein. This longitudinal groove *a'* extends along the shank to the handle and is extended in the handle to form a long recess or socket *a''*. The bottom of the longitudinal groove *a'* is provided with a toothed rack *l*. The sides of the shank are provided with longitudinal slots *e* opening into the groove.

The movable jaw may be made to work in the guide-way, as shown in Fig. 1, or may be pivoted to a movable jaw D, as shown in Fig. 2. The jaw C is made with a tongue *c''* on the under side and an extension arm *c*. This arm and part of the tongue are provided with teeth on the back edge forming a toothed rack *n*, adapted to

engage with the toothed rack *l*. The tongue *c''* and the arm work in the longitudinal groove *a'*, and the arm also works in the slot *a* in the fixed jaw A<sup>1</sup>. The groove and the slot form a guide-way for the tongue and arm, and the outer solid portion of the fixed jaw acts as a stop for limiting the outward movement of the arm as indicated in Fig. 1. The full lines in Fig. 1 represent the movable jaw C in the open or ready position for application to a nut or pipe while the dotted lines represent it in a closed position. The jaw C is loosely connected to the shank by means of a pin *f* which passes through the rear end of the jaw into the side slots *e*. The movable jaw is also provided with a longitudinal shoulder *d* on each side, adjacent to the tongue *c''*, which shoulders bear upon the front edges of the shank. A spiral compression spring *g* is placed in a deep recess *a''* in the shank and bears on a turned down end of the tongue *c''* of jaw C and serves to throw the jaw toward the fixed jaw and outward into the ready position indicated in Fig. 1. The spring *g* may be inserted or withdrawn by removing the cap at the end of the handle. The fixed jaw A<sup>1</sup> is provided on its inner face with teeth *k* and the movable jaw is provided on its inner face with teeth *m* for better gripping or biting into the nut or pipe to be turned.

In Fig. 2 a slightly modified form of wrench is shown in which the movable jaw is composed of a pivoted and swinging part C<sup>1</sup> and a well known adjustable jaw D. The swinging or oscillating part C<sup>1</sup> is connected by a pivotal pin *f'* to the jaw D, and has a plain extension arm *c'* in the slot *a*. In this modification the shank has a longitudinal opening *g'* for the screw *l'* and nut *n'* in jaw D.

In the modification shown in Figs. 3 and 4, a combination jaw is used, composed of a sliding self adjusting toothed part C<sup>2</sup> and a pivoted jaw part C<sup>1</sup>, which together operate substantially the same as the single self adjusting jaw, shown in Fig. 1. The jaw part C<sup>1</sup> is provided with an extension arm *c'* to assist in throwing the jaw C off from a nut or pipe with which it may be engaged, while the toothed arm *c* may, after adjustment, be held in engagement with the rack *l* by a spring clip or pawl *p* pivoted to the side of jaw A<sup>1</sup> in slot *a*. The spring *g* will push the single jaw C, Fig. 1, or the part C of the

combination jaw, Figs. 3 and 4, toward the fixed jaw  $A^1$  and outward into the ready position as shown in full lines.

The inclined back face or edge of jaw C will also serve as a rest for the thumb in operating the wrench. By bearing the thumb upon the jaw C or  $C^1$  it may be pushed up tight against a nut or pipe when it is to be turned and by raising the thumb the jaw will be released and thrown outward by means of the spring when the handle of the wrench is oscillated for causing the jaws to take a new hold or grip upon the nut or pipe. When turning up a nut or pipe to its seat, the handle  $A^2$  of the wrench is oscillated or moved from right to left and the teeth  $k$  and  $m$  on the jaws will bite into the part to be turned, and when the handle is oscillated in the opposite direction the extension arm  $c$  or  $c'$  will assist in throwing jaw C or  $C^1$  and its teeth off from the nut or pipe, so that an oscillating movement may be given to the wrench without removing the jaws from the nut or pipe before giving it another turn to screw it to its seat. This greatly facilitates the operating of the wrench and increases its usefulness.

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

1. A wrench comprising a shank having a toothed rack and a fixed jaw at its upper end provided with a longitudinal slot, a movable pivoted jaw having a toothed rack

on a part thereof, adapted to engage the rack on the shank and also an extension arm oscillating in said slot of the fixed jaw, and a spring in the shank bearing on the rear end of the movable jaw to throw it outward into position for application to a nut or pipe, substantially as described.

2. A wrench comprising a shank having a longitudinal groove and toothed rack, a fixed jaw provided with a longitudinal slot, a movable jaw having an extension arm adapted to work in the slot and a toothed rack adapted to engage the rack in the groove, and a spring attached to the shank and acting to throw the movable jaw outward into the ready position, substantially as described.

3. A wrench comprising a shank having an outer fixed jaw, said parts being provided, respectively, with a longitudinal groove and a slot, the shank also being provided with longitudinal side slots, a movable jaw having an extension arm, a pin engaging the jaw with said side slots, and a spring attached to the shank and acting to throw outward the movable jaw, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS H. THORNE.

Witnesses:

M. A. VAN ROGGEN,  
P. R. DUNCAN.