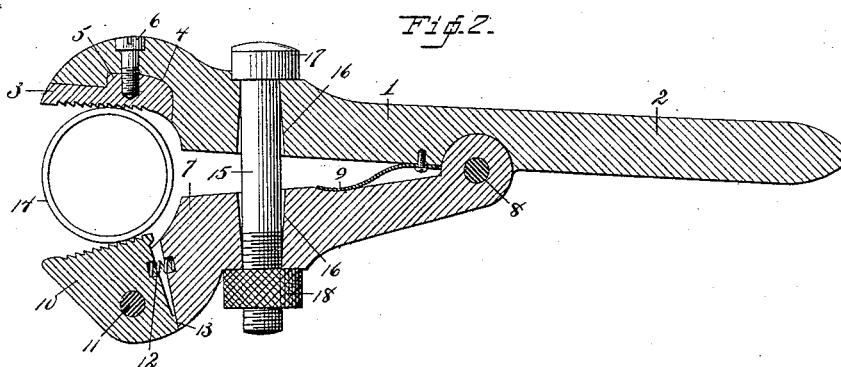
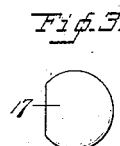
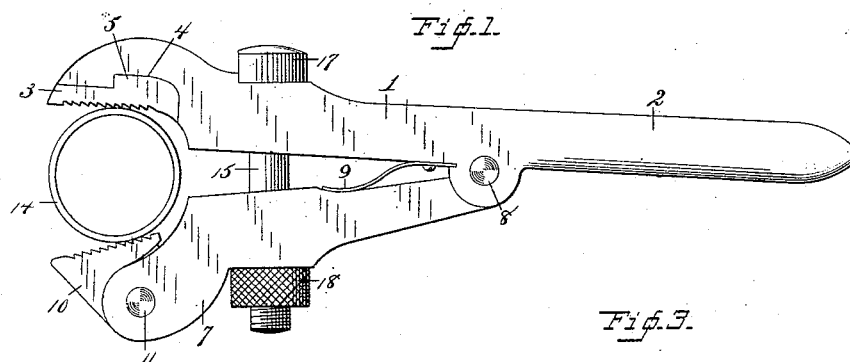


(No Model.)

I. MORSE.  
PIPE WRENCH.

No. 344,978.

Patented July 6, 1886.



Witnesses.

C. C. Perkins.  
C. E. Ruggles.

*In Vegetar.*

Ira Morse  
By  
A. M. Wooster  
Atty.

# UNITED STATES PATENT OFFICE.

IRA MORSE, OF DANBURY, CONNECTICUT.

## PIPE-WRENCH.

SPECIFICATION forming part of Letters Patent No. 344,978, dated July 6, 1886.

Application filed April 22, 1886. Serial No. 199,747. (No model.)

*To all whom it may concern:*

Be it known that I, IRA MORSE, a citizen of the United States, residing at Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Wrenches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-  
10 pertains to make and use the same.

My invention relates to the class of wrenches which are designed more especially for plumbers' and gas-fitters' use, and has for its general object to simplify and improve the construction thereof, the special object being to produce a wrench in which the jaws shall act in a line with the handle, instead of in a line at right angles thereto, so that the wrench will be much better adapted for use in cramped  
20 places—as, for example, in pipe-fitting—than those now upon the market.

With these ends in view I have devised the simple and novel construction of which the following description, in connection with the  
25 accompanying drawings, is a specification, numbers being used to indicate the several parts of the device.

Figure 1 is a side elevation of the device complete; Fig. 2, a longitudinal section thereof, and Fig. 3 is a detail plan view of the bolt-head.

1 indicates the bar of the wrench, at one end of which the handle 2 is formed, and which is provided at its opposite end with a jaw, 3, whose teeth are directly in line with the bar-handle. This jaw may, of course, be made integral with the bar. I preferably, however, provide the bar with a recess, 4, and form the jaw proper in a separate piece, which is provided with a shoulder or enlargement, 5, which fits closely in recess 4, the parts being held in position by a screw, 6, which passes through the bar and engages the enlargement upon the jaw proper.

Should a jaw become worn out in use, it may be readily removed and a new one substituted, or, should the work require different-sized teeth upon the jaws, they may be readily changed without trouble.

50 It will be noticed that the shape of the teeth upon the upper jaw is such that in use the strain is outward. By providing the bar with

a recess and the jaw with an enlargement engaging therewith I am enabled to add greatly to the strength of the tool.

7 is an arm, which is hinged to the bar, as at 8, about midway of its length.

9 is a spring secured to the bar and adapted to bear against the arm, whereby the latter is held at its opened position—that is, away from  
60 the bar.

10 indicates the lower jaw, which is pivoted in the usual manner in arm 7, as at 11.

12 is a coil-spring, partially recessed into the arm and partially into the lower jaw, the action of which is to force the lower jaw outward—that is, to its operative position, a stop, 13, being provided to limit the outward movement of the lower jaw. It will be noticed in the drawings that the teeth upon the lower jaw are so formed that the strain in use is inward.

14 indicates a pipe, and shows clearly the manner in which the jaws act upon it.

15 is a pin or bolt adapted to pass through both the bar and the arm, the opening 16 in said bar and arm being sufficiently large to permit the arm to be drawn toward the bar as in grasping different-sized pipes. It is of course necessary that the pin or bolt should be prevented from turning in the openings. I have therefore shown the bolt-head 17 as made angular upon one side and adapted to engage a shoulder upon the bar. The lower end of the pin or bolt is screw-threaded and is engaged by a nut, 18, whereby the arm is drawn toward the bar to adjust the jaws. As the nut is turned outward, spring 9 acts to throw the arm to its farthest open position.

It is an important feature of my improved construction that the bolt or pin is wholly detached from both bar and arm, so that should it be more convenient in use it may be taken out and reversed—that is, the head may be placed on the lower side and the nut upon the upper side.

The operation is as follows: The jaws are adjusted at sufficient distances apart to permit the pipe or other article to be grasped to enter firmly between them. The wrench is then placed upon the pipe in the same manner that pliers are used, the action in trimming being a downward movement of the handle, the strain upon the teeth of the upper jaw being

outward, and upon the teeth of the lower jaw inward. As the lower jaw is adapted to have a slight movement inward, it follows that the greater the pressure upon the handle the tighter will be the grip of the jaws upon the article between them.

By constructing the jaws to stand outward—that is, in the manner of the jaws of pliers, the upper jaw being parallel to the line of the bar, and the lower jaw standing at an acute angle thereto—it results that there can be no change of distance between the points which bear upon the pipe in use and the pivotal point of the arm. There can therefore be no lateral nor any backward and forward motion of the lower jaw, as is unavoidable in wrenches in which the jaws are set at a right angle to the bar and are made to open and close by means of a screw or similar device upon the side of the bar. Moreover, this form of wrench is much more convenient in working on a pipe placed in a corner or lying against a wall. Likewise in laying pipes in trenches this form is of great advantage, as the wrench can be placed vertically on the pipe and all space between the sides of the trench can be used in moving the wrench, it being unnecessary to raise the pipe to hook the wrench upon one side thereof.

It will, of course, be understood that I do not desire to limit myself to the exact details of construction shown and described, as it is obvious that they may be varied within reasonable limits without departing from the spirit of my invention.

I claim—

1. A wrench consisting, essentially, of a bar having a handle at one end and a jaw at the other in line with the bar, in combination with an arm pivoted to said bar, and having at its outer end a pivoted jaw, a threaded pin or bolt adapted to pass through openings in said bar or arm, and a nut adapted to engage the threaded pin or bolt.

2. The bar having a jaw at its outer end, and an opening, 16, through it, in combination with an arm pivoted to said bar and hav-

ing a similar opening through it, a pivoted jaw at the outer end of said arm, a spring, 12, acting to hold said pivoted jaw in its opened position, and a bolt adapted to pass through the openings in the bar and arm and provided with a nut, whereby the jaws may be adjusted for different classes of work.

3. The bar having a recess, 4, jaw 3, having a shoulder 5, adapted to engage said recess, and a screw for holding said jaw in position, in combination with an arm pivoted to the bar, and having at its outer end a pivoted jaw, and a bolt and nut, whereby the arm may be closed upon the jaw to adjust the wrench.

4. The jaw having an opening through it and a detachable jaw at its outer end, in combination with an arm pivoted to said bar and carrying at its outer end a pivoted jaw, a bolt and nut for compressing said arm upon the bar, and a spring, 9, whereby the arm is held at its farthest open position.

5. The bar having a jaw at its outer end, arm 7, pivoted to said bar, and having at its outer end a pivoted jaw, 10, and a spring, 12, for holding said pivoted jaw to its operative position, in combination with a threaded pin or bolt adapted to pass through openings in the bar and arm, a nut engaging said pin or bolt to move the arm inward, and a spring, 9, adapted to hold the arm against the nut.

6. The bar having a jaw at its outer end whose teeth lie parallel to the plane of the bar, and an arm pivoted to the bar and having a pivoted jaw at its outer end, the plane of said pivoted jaw being at an acute angle to the plane of the upper jaw, in combination with the bolt having a head made angular to prevent it from turning, and adapted to pass through openings in said bar and arm, and a nut engaging said bolt, whereby the arm is moved inward.

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

IRA MORSE.

Witnesses:

LEVI K. MANSFIELD,  
GEORGE WAKEMAN.